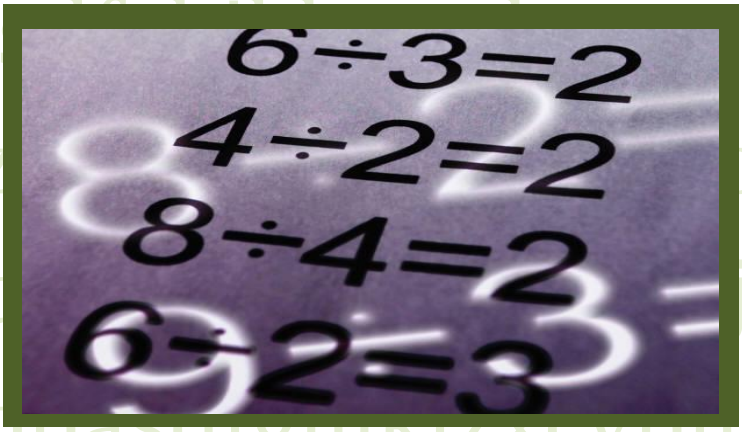
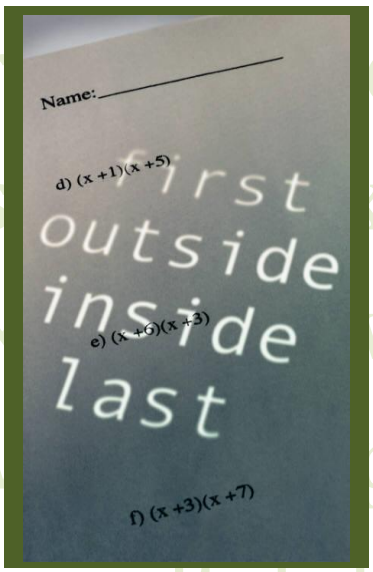


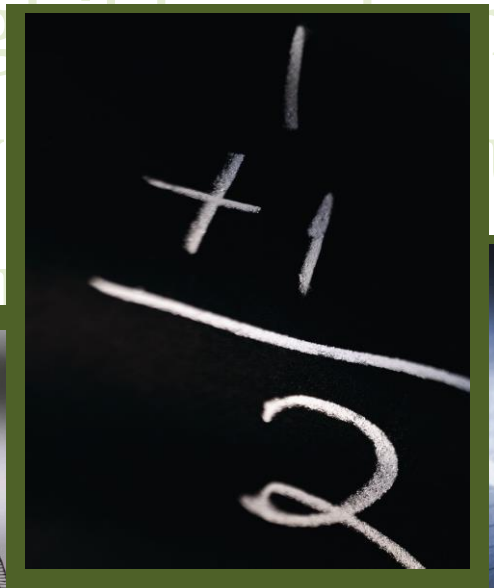


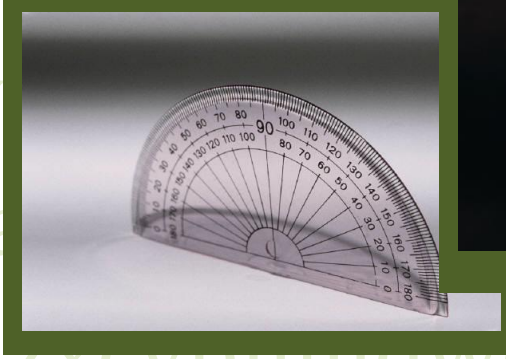
Westampton Township School District

Mathematics
Curriculum Guide

Kindergarten – 8th Grade

Approved by Westampton Township Board of Education: June 12, 2017





Westampton Township School District

Mathematics
Curriculum Guide

Kindergarten – 8th Grade

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Table of Contents

Introduction

District Mission Statement

The Westampton School District, in partnership with its Community, shall do whatever it takes to ensure that every child achieves or exceeds proficiency in the current New Jersey Core Curriculum Content Standards.

Be open! Be creative! Be accountable!

Vision Statement

To create a climate where the Community and District support the instructional process by incorporating an effective, comprehensive communication system that incorporates the whole child as its driving force involving parents, staff, and the Community by utilizing appropriate data to challenge the students and teachers to maximize each student's level of achievement.

Curriculum and Instruction Vision Statement

Westampton Township School District's Office of Curriculum and Instruction is committed to supporting, implementing, and supervising K – 8 curriculum that is rigorous, meaningful, differentiated, culturally responsive, and academically challenging to ensure that students receive high-quality instruction that promotes excellence and high expectations, prepares all students for the rigors of high school and postsecondary education and produces dynamic student achievement and lifelong learners.

Mathematics Education Philosophy

Mathematics is universal, relevant and essential for every person who aspired to achieve some level of success in his/her life. Therefore, high-quality, engaging mathematics instructions for all students must be the ultimate goal of the mathematics classroom program. Teachers must have an adequate knowledge of mathematics concepts, a broad knowledge of pedagogy, and a range of sufficient resources to teach. However, more so, the teacher must have a passionate commitment to using both knowledge and resources to impact student achievement.

Mathematics curriculum and program must be rich with opportunities for students to explore mathematical concepts, while learning the basic and fundamental skills necessary to progress and complete more complex mathematical tasks. Students must know how to do more than calculate and solve problems, but students need to develop deeper understanding as to how mathematics topics and processes work, therefore, becoming comfortable with seeking multiple methods and avenues for arriving at their solutions.

Strong mathematics curriculum acknowledges the wide variety of mathematical topics and approaches, but encourages reasoning, multiple methodologies and strategies to support students in determining how they engage in utilizing mathematics in multiple contexts. The goal is to develop students who have mathematical literacy and competency that transfers in other subject areas, but, more importantly, into their daily and future experiences.

Curriculum Guide

The Mathematics Curriculum is developed to reflect the mission and vision of the Westampton Township School District. This curriculum incorporates the 2017 Common Core Standards for Mathematics.

The curriculum format and template is largely influenced by Understanding by Design, Expanded 2nd Edition by Grant Wiggins and Jay McTighe. As recognized experts in curriculum and instructional design, we thought it was essential to utilize their work as the foundation for building a comprehensive, practical, and user-friendly curriculum..

This curriculum guide includes instructional objectives, teaching strategies, learning activities, assessments, and resources, tools which should be utilized throughout the school year by teachers to ensure that all students receive a rigorous, standards-based instruction. However, since the backward design model acknowledges that there are many "entry points" to writing curriculum and designing units, teachers have opportunity throughout the school year to include additional information in all areas of the curriculum to ensure that there is alignment, clarity, and rigor throughout the curriculum. This revisionist stage of the document, specifically in Year 2 of the curriculum revision cycle will allow for all teachers to have input in the construction of curriculum, which should result in both collaboration and ownership. Therefore, this guide is ongoing and continues to evolve as research changes and classroom practice determines new ways to teach students and increase student achievement. This document allows for ongoing dialogue and contributions by teachers and administrators to ensure that this guide provides the best education possible for all students.

Kindergarten

Unit: Number Sense Patterning - Section 1	Suggested Sequence: September – beginning October

NJSLS:

K.C.C.1 Count to 100 by ones and by tens.
K.CC.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
K.C.C.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
K.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.
K.CC.4.a: When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
K.C.C.4.b: Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
K.C.C.4.c: Understand that each successive number name refers to a quantity that is one larger.
K.C.C.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.
K.C.C.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.
K.O.A.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).
K.O.A.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
K..MD.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
K.MD.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. *For example, directly compare the heights of two children and describe one child as taller/shorter.*
K.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.
K.G.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as abo*ve*, *below*, *beside*, *in front of*, *behind*, and *next to*.
K.G.2 Correctly name shapes regardless of their orientations or overall size.
K.G.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).
K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
K.G.6 Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?"*

Essential Questions:	***Enduring Understandings:***
• Why do we measure? • What are tools of measurement and how can they be used? • What do numbers convey? • How can we compare and contrast numbers? • How can patterns be used to describe situations? • How can attributes be used to classify data/objects? • How can the collection, organization, interpretation, and display of data be used to answer questions? • What are different ways to count?	• Everyday objects have a variety of attributes, each of which can be measured in many ways. • What we measure affects how we measure it. • Numerical fluency includes both the understanding of and the ability to appropriately use numbers. • Numbers can represent position, location, quantity, and relationships. • A quantity can be represented numerically in a variety of ways. • Patterns can be represented graphically, numerically, symbolically, or verbally. • Grouping attributes (classification) can be used to answer mathematical questions.

• What are efficient ways to count?	• The message conveyed by the data depends on how the data is collected, represented, and summarized. • Counting finds the answer to how many in sets or objects.

Knowledge, Skills, and Instructional Objectives:

1.1 Introduce measurement comparisons through a partner activity
1.2 Introduce pattern blocks
1.3 Introduce counting and one-to-one correspondence through multi-sensory activities
1.4 Introduce the concept of zero, the word *zero*, and the numeral " 0"
1.5 Introduce the numbers 1-9 through a variety of activities
1.6 Introduce attributes and sorting
1.7 Introduce volume through sand and water play
1.8 Introduce bar graphs through age and birthday information
1.9 Introduce patterns through multi-sensory, experiential activities
1.10 Introduce simple color patterns
1.11 Provide practice with sorting and lay groundwork for coin recognition
1.12 Develop number sense and counting skills through an oral counting game
1.13 Provide practice with comparing lengths
1.14 Reinforce counting and recognizing numerals 0-10

Recommended Instructional Activities/Resources:

1.1 - Partner Match
- T46-47
- Matching Strips
- Establish daily routines

1.2 – Introduction to Pattern Blocks
- T48-49
- Exploring Pattern Blocks
- Establish daily routines

1.3 – Multisensory Counts
- T50-51
- Counting by Touch and Sound
- Establishing daily routines

1.4 – Countdown to Zero
- T52-53
- Singing and Eating Down to Zero
- Establishing daily routines

1.5 – Getting to Know Numbers (1-9)
- T54-55
- Exploring Featured Numbers
- Establishing daily routines

1.6 – Introduction to Sorting
- T56-57
- Sorting by Attributes
- Getting to Know Numbers – Number Two

1.7 – Sand and Water Play

- T58-59
- Experimenting with Volume
- Getting to Know Numbers – Number Three

1.8 – Birthday Graphs
- T60-61
- Graphing Birthday and Ages
- Getting to Know Numbers – Number Four

1.9 – Sound and Motion Patterns
- T62-63
- Discovering Patterns
- Getting to Know Numbers – Number Five

1.10 – Patterns with Color
- T64-65
- Creating and Extending Patterns
- Getting to Know Numbers – Number Six

1.11 – Coin Comparisons
- T66-67
- Sorting Coins into "Banks"
- Getting to Know Numbers – Number Seven

1.12 – Give the Next Number Game
- T68-69
- Playing Give the Next Number Game
- Getting to Know Numbers – Number Eight

1.13 – Body Height Comparisons
- T70-71
- Comparing Body Heights to Objects
- Getting to Know Numbers – Number Nine

1.15– Finger Count Fun
- T72-73
- Reviewing Numbers
- Getting to Know Numbers – Counting Book

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century-Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.P.D.1 - Describe characteristics of oneself, one's family, and others

Suggested Assessments/Benchmarks:

1.1 Ongoing teacher observation
1.2 Ongoing teacher observation
1.3 Ongoing teacher observation, Home Link
1.4 Ongoing teacher observation
1.5 Ongoing teacher observation, Home Link
1.6 Ongoing teacher observation
1.7 Ongoing teacher observation, Home Link
1.8 Ongoing teacher observation
1.9 Ongoing teacher observation
1.10 Ongoing teacher observation
1.11 Ongoing teacher observation, Home Link
1.12 Ongoing teacher observation, *Give the Next Number* (Game play)
1.13 Ongoing teacher observation
1.14 Ongoing teacher observation, Math Masters p103

Unit: 2 D Shapes/Number Stories - Section 2	Suggested Sequence: Mid October – Mid November

NJSLS:

K.C.C.1 Count to 100 by ones and by tens.
K.CC.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
K.C.C.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
K.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.
K.CC.4.a: When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
K.C.C.4.c: Understand that each successive number name refers to a quantity that is one larger
K.C.C.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.
K.C.C.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.
K.OA.1 Represent addition and subtraction up to 10 with objects, fingers, mental images, drawings2, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
K.O.A.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).
K.O.A.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation
K.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 +8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.
K.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.
K.G.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*.
K.G.2 Correctly name shapes regardless of their orientations or overall size.
K.G.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three dimensional ("solid").
K.G.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).
K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
K.G.6 Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?"*

Essential Questions:	**Enduring Understandings:**
• How do we describe shapes and their attributes? • What is symmetry? • How can we compare and contrast numbers? • How do operations affect numbers? • What makes a computational strategy both	• Shapes can be described and classified by their attributes. • Symmetry can be found in real world objects. • Numerical fluency includes both the understanding of and the ability to appropriately use numbers. • The magnitude of number affects the outcome of the

effective and efficient? • What are different ways to count? • What are efficient ways to count?	operations on them. • Computational fluency includes understanding the meaning and the appropriate use of a problem. • Counting finds the answer to how many in sets or objects.

Knowledge, Skills, and Instructional Objectives:

2.1 Introduce circles, triangle, squares, and rectangles
2.2 Develop understanding of shapes using the sense of touch
2.3 Review spatial vocabulary and concepts
2.4 Reinforce counting and reading numbers 1-10 using a game
2.5 Reinforce recognition of patterns through a pattern search activity
2.6 Develop oral counting skills through movement activities
2.7 Lay groundwork for number writing through kinesthetic and tactile stroke-formation activities
2.8 Promote coin recognition using a game
2.9 Reinforce the meaning of numbers by constructing a class number board
2.10 Introduce and provide practice with counting and recognizing teen numbers
2.11 Reinforce oral counting and recognizing teen numbers through a movement activity
2.12 Introduce the concept that teen numbers represent "10 and some more"
2.13 Introduce the concept of estimation
2.14 Introduce addition and subtraction number stories
2.15 Introduce symmetry
2.16 Develop understanding of symmetry in natural objects

Recommended Instructional Activities/Resources:

2.1 – Shape Collages
- T88-89
- Exploring Shapes
- Playing Give the Next Number

2.2 – Shapes by Feel
- T90-91
- Identifying Attributes of Shapes
- Adding to Shape Collages

2.3 – Which Way Do I Go?
- T92-93
- Completing an Obstacle Course
- Adding to the Shape Collages

2.4 – Spin A Number Game
- T94-95
- Making and Playing Spin A Number
- Reviewing Visual Patterns

2.5 – Patterns All Around
- T96-97
- Looking for Patterns
- Using Pattern Block
-

2.6 – Playful Oral Counting Games
- T98-99
- Playing Counting Games

- Using Pattern Blocks

2.7 – Preparation for Number Writing
- T100-101
- Introducing Strokes with Stories
- Getting to Know Numbers, 1-9

2.8 – Matching Coin Game
- T102-103
- Playing the Matching Coin Game
- Getting to Know Numbers, 1-9

2.9 – Number Board
- T104-105
- Building a Number Board
- Playing Give the Next Number

2.10 – Tricky Teens
- T108-109
- Introducing the "Tricky Teens"
- Sorting Objects

2.11 – Listen and Do (10-19)
- T110-111
- Counting and Moving
- Playing *I Spy*

2.12 – Teen Partners
- T112-113
- Representing Teen Numbers
- Arranging Objects by Length

2.13 – Estimation Jars
- T114-115
- Making an Estimate
- Arranging Objects by Length

2.14 – Number Stories: Stage 1
- T116-117
- Telling and Acting Out Number Stories
- Playing *Count and Sit* with Teens

2.15 – Symmetry Painting
- T120-121
- Making Symmetrical Paintings
- Playing *Follow the Leader* with Teens

2.17– Symmetry in Nature
- T122-123
- Making a Group Symmetry Collage
- Creating a Bar Graph

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

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CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.P.D.1 - Describe characteristics of oneself, one's family, and others

Suggested Assessments/Benchmarks:
2.1 Ongoing teacher observation, Home Link
2.2 Ongoing teacher observation
2.3 Ongoing teacher observation
2.4 Ongoing teacher observation, *Spin a Number* (Game play)
2.5 Ongoing teacher observation, Home Link
2.6 *Count and Sit* (Game play)
2.7 Ongoing teacher observation
2.8 Ongoing teacher observation, Home Link, *Matching Coin Game* (Game play)
2.9 Ongoing teacher observation
2.10 Ongoing teacher observation
2.11 Ongoing teacher observation
2.12 Ongoing teacher observation
2.13 Ongoing teacher observation, Home Link
2.14 Ongoing teacher observation
2.15 Ongoing teacher observation
2.16 Ongoing teacher observation

Unit: Probability, Addition, Subtraction - Section 3	Suggested Sequence: Mid November - December

NJSLS:

K.C.C.1 Count to 100 by ones and by tens.

K.CC.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).

K.C.C.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

K.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.

K.CC.4.a: When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

K.C.C.4.c: Understand that each successive number name refers to a quantity that is one larger

K.C.C.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.

K.C.C.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.

K.CC.7 Compare two numbers between 1 and 10 presented as written numerals.

K.OA.1 Represent addition and subtraction up to 10 with objects, fingers, mental images, drawings2, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

K.O.A.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation

K.O.A.5 Demonstrate fluency for addition and subtractio within 5.

K.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 +8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

K..MD.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

K.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

Essential Questions:	***Enduring Understandings:***
• Why is there a need for standardized units of measurement? • How exact does a measurement have to be? • How can experimental and theoretical probabilities be used to make predictions or draw conclusions? • How can attributes be used to classify data? • Why is data collected and analyzed? • How can predictions be made based on data?	• Standard units of measure enable people to interpret results or data. • All measurements have some degree of uncertainty. • The way that data is collected, organized and displayed influences interpretation. • The probability of an event's occurrence can be predicted with varying degrees of confidence. • Classifying data by attributes can be used to answer

• What makes a computational strategy both effective and efficient? • How do operations affect numbers? • How do we compare and contrast numbers?	mathematical questions. • The message conveyed by data depends on how the data is collected, represented, and summarized. • Computational fluency includes the understanding of the meaning and the appropriate use of a problem. • The magnitude of numbers affects the outcome of the operations on them. • A quantity can be represented numerically in various ways. • Numerical fluency includes both the understanding of and the ability to appropriately use numbers.

Knowledge, Skills, and Instructional Objectives:

3.1 Provide practice with writing and representing numbers
3.2 Provide practice with creating and describing patterns through an art project
3.3 Review counting and number recognition through a graphing activity
3.4 Introduce the pan balance as a tool to compare the weights of objects
3.5 Introduce a game that involves matching numbers of dots to written numbers
3.6 Introduce a game that reinforces number relationships and number recognition
3.7 Introduce measurement techniques using interlocking cubes or other nonstandard measuring devices
3.8 Develop children's understanding of addition and subtraction using concrete experiences
3.9 Review counting, number recognition, and sequencing numbers 0-20 through number card activities
3.10 Introduce the basic language of probability
3.11 Develop children's understanding of probability
3.12 Review the use of the pan balance and introduce the concept of balancing objects
3.13 Introduce a series of games that provide practice with counting and concrete addition and subtraction
3.14 Provide practice with making and analyzing a bar graph
3.15 Introduce skip counting by 10s
3.16 Introduce a game that provides practice with teen numbers and builds number sense

Recommended Instructional Activities/Resources:

3.1 – Number Book
- T138-139
- Writing Numbers 0-10
- Reviewing Color Patterns

3.2 – Macaroni Necklaces
- T140-141
- Making Macaroni Necklaces
- Estimating Pennies

3.3 – Roll and Record
- T142-143
- Graphing Dice Rolls
- Continuing Number Books

3.4 – The Pan Balance
- T144-145
- Introducing the Pan Balance
- Playing *Give the Next Number*

3.5 – Domino Concentration Game

- T148-149
- Playing *Domino Concentration*
- Continuing Number Books

3.6 – *Monster Squeeze* Game
- T150-151
- Playing *Monster Squeeze*
- Telling and Drawing Number Stories

3.7 – Measurement with Objects
- T152-155
- Measuring with Nonstandard Units
- Continuing Number Books

3.8 – Pocket Problems
- T156-157
- Solving Pocket Problems
- Graphing Dice Rolls

3.9 – Number Card Games
- T158-159
- Playing Number Card Games
- Continuing Number Books

3.10 – Probability Stories
- T160-161
- Thinking about Probability: Can Pigs Fly?
- Creating Shape Art

3.11 – Probability Tray
- T162-163
- Using a Probability Tray
- Creating Shape Art

3.12 – Pan Balance 2: Leveling
- T164-165
- Balancing Objects with Clay
- Playing *Count and Sit*

3.13 – Train Games
- T166-167
- Playing Train Games
- Finding *I Spy* Patterns

3.14 – Favorite Colors Graph
- T168-169
- Graphing Favorite Colors
- Measuring with Objects

3.15 – Count by 10s
- T170-171

- Counting by 10s
- Solving Pocket Problems

3.16 – *Teen Frame* Game
- T172-173
- Playing *Teen Frame*
- Choosing a Probability Tray

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
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CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.P.D.1 - Describe characteristics of oneself, one's family, and others

Suggested Assessments/Benchmarks:
3.1 Ongoing teacher observation, Math Masters p13-23
3.2 Ongoing teacher observation, Home Link
3.3 Ongoing teacher observation, Math Masters p26, 27
3.4 Ongoing teacher observation
3.5 Ongoing teacher observation, *Domino Concentration* (Game play)
3.6 Ongoing teacher observation, *Monster Squeeze* (Game play), Home Link
3.7 Ongoing teacher observation, Home Link
3.8 Ongoing teacher observation
3.9 Ongoing teacher observation, *Number Card Games* (Game play)
3.10 Ongoing teacher observation
3.11 Ongoing teacher observation
3.12 Ongoing teacher observation, Home Link
3.13 Ongoing teacher observation
3.14 Ongoing teacher observation
3.15 Ongoing teacher observation, Home Link
3.16 Ongoing teacher observation, *Ten Frame* (Game Play)

Unit: Attributes, Graphing, Measuring - Section 4	Suggested Sequence: January

NJSLS:

K.C.C.1 Count to 100 by ones and by tens.

K.CC.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).

K.C.C.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

K.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.

K.CC.4.a: When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

K.C.C.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.

K.CC.7 Compare two numbers between 1 and 10 presented as written numerals.

K.OA.1 Represent addition and subtraction up to 10 with objects, fingers, mental images, drawings2, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

K.O.A.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

K.O.A.5 Demonstrate fluency for addition ad subtraction within 5.

K.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 +8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

K.G.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*.

K.G.2 Correctly name shapes regardless of their orientations or overall size.

K.G.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).

K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

K.G.6 Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?"*

Essential Questions:	***Enduring Understandings:***
• How do operations affect numbers? • How can we compare and contrast numbers? • How can we decide when to use an exact answer and when to use an estimate? • How can change be represented mathematically? • How can the collection, interpretation, and display of data be used to answer questions? • How can experimental and theoretical probabilities be used to make predictions or draw conclusions?	• The magnitude of numbers affects the outcome of the operations on them. • There are many ways to represent a number. • Number sense develops through experience. • Context is critical when using estimation. • One representation may sometimes be more helpful than another; and used together, multiple representations give a fuller understanding of a problem.

Knowledge, Skills, and Instructional Objectives:

4.1 Develop addition and subtraction strategies using a walk-on number line
4.2 Introduce a game that reinforces number recognition and number comparisons
4.3 Introduce the Pattern-Block Template
4.4 Introduce addition terminology and symbols using number stories and counters
4.5 Provide practice with creating, extending, and describing patterns
4.6 Introduce interrupted counting
4.7 Introduce calculators and to provide practice with reading and entering numbers
4.8 Provide experiences with addition, graphing outcomes, and probability
4.9 Deepen children's understanding of shapes through a cooperative movement activity
4.10 Solidify children's understanding of shapes
4.11 Introduce subtraction terminology and symbols using number stories and counters
4.12 Provide practice with number writing and other numeration skills
4.13 Introduce attribute blocks
4.14 Introduce a game that helps children think about sorting rules
4.15 Develop understanding of mathematical symbols and language in the context of addition and subtraction number stories
4.16 Provide practice with reading and representing 2-digit numbers

Recommended Instructional Activities/Resources:

4.1 – Number Line Mathematics
- T188-189
- Counting Steps on the Number Line
- Exploring Pattern Blocks

4.2 – *Top-It* Card Games
- T190-191
- Playing *Top-It*
- Skip Counting by 10s

4.3 – The Pattern-Block Template
- T192-193
- Exploring the Pattern-Block Template
- Solving Pocket Problems

4.4 – The Addition Symbol (+)
- T194-195
- Joining Objects Using the Addition Symbol
- Creating Pattern Strips

4.5 – Follow My Pattern
- T196-197
- Creating and Extending Pattern-Block Patterns
- Estimating Objects in a Collection

4.6 – Interrupted Counts
- T198-199
- Counting from Different Numbers
- Graphing Dice Rolls

4.7 – Meet the Calculator
- T200-203
- Exploring Calculators
- Playing *Teen Frame*

4.8 – Roll and Record with Two Dice
- T204-205
- Graphing Sums of Dice
- Feeling Shapes

4.9 – Body and Rope Shapes
- T206-207
- Making Shapes
- Making Symmetrical Snowflakes

4.10 – Shape Comparisons
- T208-209
- Comparing Shapes
- Sorting Names

4.11 – The Subtraction Symbol (-)
- T210-211
- Removing Objects Using the Subtraction Symbol
- Practicing Number Writing

4.12 – Slate Activites
- T212-213
- Using Slates
- Measuring with Objects

4.13 – Introduction to Attribute Blocks
- T214-215
- Exploring Attribute Blocks
- Counting On from Different Numbers

4.14 – *"What's My Rule?"* Fishing Game
- T216-217
- Fishing for Children
- Playing *I Spy* with Shapes

4.15 – Number Stories: Stage 2

- T218-219
- Relating Symbols to Number Stories
- Counting by 10s

4.17– Two-Digit Numbers

- T220-221
- Reading 2-Digit Numbers
- Describing Probability

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology:

8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.P.D.1 - Describe characteristics of oneself, one's family, and others

Suggested Assessments/Benchmarks:

4.1 Ongoing teacher observation
4.2 Ongoing teacher observation, *Top It* (Game Play), Home Link
4.3 Ongoing teacher observation
4.4 Ongoing teacher observation
4.5 Ongoing teacher observation, Home Link
4.6 Ongoing teacher observation
4.7 Ongoing teacher observation
4.8 Ongoing teacher observation, *Graphing Sums of Dice* (Game play)
4.9 Ongoing teacher observation
4.10 Ongoing teacher observation
4.11 Ongoing teacher observation
4.12 Ongoing teacher observation
4.13 Ongoing teacher observation, Home Link
4.14 Ongoing teacher observation, *"What's My Rule?" Fishing Game* (Game play)
4.15 Ongoing teacher observation
4.16 Ongoing teacher observation

Unit: Estimation/Number Stories - Section 5	Suggested Sequence: February

NJSLS:

K.CC.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
K.C.C.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
K.C.C.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.
K.O.A.5 Demonstrate fluency for addition and subtraction within 5.
K..MD.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
K.MD.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. *For example, directly compare the heights of two children and describe one child as taller/shorter.*
K.G.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*.
K.G.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).

Essential Questions:	***Enduring Understandings:***

• What are the tools of measurement and how can they be used? • How do the different units of time relate to each other? • Why is there a need for standardized units of measurement? • How can patterns be described? • How do you determine the best numerical representation (pictorial, symbolic, objects) for a given situation? • What aspects of a graph help people understand and interpret the data easily? • How can attributes be used to classify data or objects?	• The choice of measurement tool depends on the measurable attribute and the degree of precision required. • Minutes, days, and weeks are relevant to daily life. • Standard units of measure enable people to interpret results or data. • Patterns and relationships can be represented numerically, graphically, symbolically, and verbally. • There are many ways to represent a number. • Graphs covey data in a concise way. • Grouping attributes (classification) can be used to answer mathematical questions.

Knowledge, Skills, and Instructional Objectives:

5.1 Increase awareness of the passage of time and order of events
5.2 Reinforce patterning skills, including creating, extending, and describing visual patterns
5.3 Introduce a game that involves using multiple attributes to identify and describe objects
5.4 Develop awareness of equivalent names for numbers using a guessing game
5.5 Introduce counting forward and backward on the calculator
5.6 Develop and extend measurement skills by using children's feet to measure objects
5.7 Promote discussion and recognition of the need for standard measurement units
5.8 Introduce skip counting by 5s
5.9 Introduce or review tally marks as a way to count and record groups of 5
5.10 Reinforce counting by 5s and introduce exchanges through a game
5.11 Reinforce the need for using standard units of measurement
5.12 Provide experiences with a variety of measuring tools
5.13 Help children make and interpret a graph about pets
5.14 Introduce a game to help children focus on multiple attributes of attribute blocks
5.15 Introduce the Class Number Grid as a mathematical tool
5.16 Develop understanding of number sequence and patterns on the Class Number Grid using a game

Recommended Instructional Activities/Resources:

5.1 – Order of Daily Events
- T236-237
- Sequencing Daily Events
- Playing the *Growing and Disappearing Train Game*

5.2 – Patterns with Craft Sticks
- T238-239
- Making Craft-Stick Patterns
- Looking Ahead to the 100th Day

5.3 – *Find the Block* Game
- T240-241
- Playing *Find the Block*
- Using Slates to Practice Writing 2-Digit Numbers

5.4 – *Guess My Number* Game
- T242-243
- Playing *Guess My Number*

- Using Pan Balances

5.5 – Count with Calculators
- T244-245
- Counting Forward and Backward with a Calculator
- Playing *Monster Squeeze*

5.6 – Measurement with Children's Feet
- T246-247
- Measuring with Feet
- Playing *Top-It*

5.7 – How Big Is a Foot?
- T248-249
- Reading and Discussing *How Big Is A Foot?*
- Counting by 10s

5.8 – Count by 5s
- T250-251
- Counting by 5s
- Graphing Sums of Dice Throwing

5.9 – Introduction of Tally Marks
- T252-253
- Introducing and Using Tally Marks
- Making Equivalent Names for Numbers

5.10 – The Raft Game
- T254-255
- Playing *The Raft Game*
- Estimating Beans

5.11 – Standard and Nonstandard Feet
- T256-257
- Measuring and Comparing
- Counting by 1s

5.12 – Tools for Measuring Length
- T258-259
- Measuring with Different Tools
- Playing *Domino Concentration*

5.13 – Pet Bar Graph
- T260-261
- Graphing Pets
- Following Craft-Stick Patterns

5.14 – Attribute Spinner Game
- T262-263
- Playing the *Attribute Spinner* Game
- Tallying Class Data

5.15 – Introduction to the Number Grid

- T264-265
- Getting to Know the Class Number Grid
- Writing Number Models for Number Stories

5.17– *Number-Grid Search* Game

- T266-267
- Playing *Number-Grid* Search
- Playing the *Matching Coin* Game

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.P.D.1 - Describe characteristics of oneself, one's family, and others

Suggested Assessments/Benchmarks:
5.1 Ongoing teacher observation
5.2 Ongoing teacher observation, Journal p1, Home Link
5.3 Ongoing teacher observation, *Find the Block* (Game play)
5.4 Ongoing teacher observation, Home Link
5.5 Ongoing teacher observation
5.6 Ongoing teacher observation, Journal p2
5.7 Ongoing teacher observation, Home Link
5.8 Ongoing teacher observation
5.9 Ongoing teacher observation, Home Link
5.10 Ongoing teacher observation, *The Raft Game* (Game play), Journal p4
5.11 Ongoing teacher observation, Journal p5
5.12 Ongoing teacher observation, Journal p6
5.13 Ongoing teacher observation, Journal p7
5.14 Ongoing teacher observation
5.15 Ongoing teacher observation, Math Masters p10
5.16 Ongoing teacher observation, *Number Grid Search* (Game Play)

Unit: Money, 3 D Shapes, Measurement – Section 6	Suggested Sequence: March

NJSLS:

K.C.C.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.

K.C.C.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.

K.OA.1 Represent addition and subtraction up to 10 with objects, fingers, mental images, drawings2, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

K.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 +8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

K..MD.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

K.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by

count.
K.G.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*.
K.G.2 Correctly name shapes regardless of their orientations or overall size.
K.G.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three dimensional ("solid").
K.G.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).

Essential Questions:	***Enduring Understandings:***
• Why is it important to understand the value of coins? • Where in the world can I find shapes? • How can objects be represented and compared using geometric attributes? • What are efficient ways to count? • What are different models of and models for addition and subtraction? • What computational tools are best suited to which circumstances? • What is the repeating and/or increasing unit in the pattern? • What strategies can be used to continue a sequence? • Why is telling time important? • How can I tell time using both digital and analog clock faces? • How can fractions be modeled and compared?	• Money is used daily in real world experiences. • Shapes are all around us. • Geometric attributes can be used to classify and describe shapes. • Counting finds out the answer to "how many" in sets. • Computation involves taking apart and combining numbers using a variety of approaches. • Flexible methods of computation involve grouping numbers in strategic ways. • Patterns can grow and repeat. • Patterns can be generalized. • Standard units for measuring time provide common language for communication about time. • Fractions express a relationship between two numbers.

Knowledge, Skills, and Instructional Objectives:
6.1 Introduce the penny
6.2 Introduce the nickel
6.3 Introduce 3-dimensional shapes and review 2-dimensional shapes
6.4 Introduce counting as a way to measure and compare time
6.5 Develop children's ability to conduct surveys and graph their results
6.6 Review characteristics of 2-dimensional and 3-dimensional shapes
6.7 Introduce the dime
6.8 Provide practice with exchanging pennies, nickels, and dimes
6.9 Introduce comparison number stories
6.10 Introduce skip counting by 2s
6.11 Introduce the concept of half
6.12 Reinforce the use of attribute clues and rules through group game
6.13 Introduce tools for measuring short periods of time
6.14 Demonstrate how to skip count on a calculator
6.15 Deepen children's understanding of patterns by introducing a way to represent patterns with symbols
6.16 Expand children's understanding of the concept of *half*

Recommended Instructional Activities/Resources:

6.1 – Introduction of the Penny
- T282-283
- Exploring the Penny
- Counting Steps on a Number Line

6.2 – Introduction of the Nickel
- T284-285
- Exploring the Nickel
- Playing the *Growing and Disappearing Train Game*

6.3 – Solid Shape Museum
- T286-289
- Making a Shape Museum
- Making Symmetrical Hearts and Other Designs

6.4 – Counts to Measure Time
- T290-291
- Beating Out Time
- Playing *The Raft Game*

6.5 – Surveys and Graphs
- T292-293
- Graphing Survey Data
- Counting to the Number of the Day

6.6 – *I Spy* with Shapes
- T294-295
- Playing *I Spy* with Shapes
- Making a "Number of Pets" Graph

6.7 – Introduction of the Dime
- T296-297
- Exploring the Dime
- Playing the *Attribute Spinner* Game

6.8 – Coin Exchanges
- T298-299
- Making Coin Exchanges
- Playing *Guess My Number* and Counting Backwards

6.9 – Comparison Number Stories
- T300-301
- Telling Comparison Stories
- Measuring in Different Ways

6.10 – Count by 2s
- T302-303
- Counting by 2s
- Estimating Nickels or Dimes

6.11 – Divide Groups in Half
- T304-305
- Dividing a Group into Halves
- Playing *Teen Frame* and *Top-It*

6.12 – *Read My Mind* Game
- T306-307
- Playing *Read My Mind*
- Playing *Monster Squeeze*

6.13 – Tools for Measuring Time
- T308-309
- Timing Activites
- Playing *Number-Grid Search*

6.14 – Skip Count with Calculators
- T310-311
- Skip Counting with Calculators
- Making Coin Patterns

6.15 – Symbolic Representations of Patterns
- T312-313
- Representing a Pattern
- Flipping a Coin

6.17– Division of Whole Objects into Halves
- T314-315
- Diving a Whole into Halves
- Writing Number Models for Number Stories

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century-Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.P.D.1 - Describe characteristics of oneself, one's family, and others

Suggested Assessments/Benchmarks:
6.1 Ongoing teacher observation, Journal p8
6.2 Ongoing teacher observation
6.3 Ongoing teacher observation, Home Link

6.4 Ongoing teacher observation, Journal p9 6.5 Ongoing teacher observation 6.6 Ongoing teacher observation 6.7 Ongoing teacher observation 6.8 Ongoing teacher observation, Home Link 6.9 Ongoing teacher observation, Journal p10 6.10 Ongoing teacher observation, Journal p11 6.11 Ongoing teacher observation, Journal p12 6.12 Ongoing teacher observation, Home Link 6.13 Ongoing teacher observation 6.14 Ongoing teacher observation, Home Link 6.15 Ongoing teacher observation, Journal p13 6.16 Ongoing teacher observation, Home Link

Unit: Place Value, Patterns & Functions - Section 7	**Suggested Sequence: April**

NJSLS:

K.C.C.1 Count to 100 by ones and by tens.

K.C.C.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

K.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.

K.C.C.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.

K.CC.7 Compare two numbers between 1 and 10 presented as written numerals.

K.OA.1 Represent addition and subtraction up to 10 with objects, fingers, mental images, drawings2, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

K.O.A.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

K.O.A.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings and record the answer with a drawing or equation

K.O.A.5 Demonstrate fluency of addition and subtraction within 5.

K.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 +8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

K.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

K.G.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three dimensional ("solid").

K.G.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).

K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

K.G.6 Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?"*

Essential Questions:	***Enduring Understandings:***
• How are place value patterns repeated in numbers? • How can place value properties aid computation? • How can numbers be expressed, ordered, and paired? • What strategies can be used to continue a patterns? • How can we compare and contrast numbers? • What kinds of questions can and cannot be answered from a graph? • Why are mathematical operations needed? • How do mathematical operations relate to each other? • Why is it important to understand the value of coins?	• Place value is based on groups of ten. • Numbers can represent quantity, position, location, and relationships. • A quantity can be represented numerically in various ways. • Patterns can grow and repeat. • Numerical fluency includes both the understanding of and the ability to appropriately use numbers. • Graphs display data in concise ways. • The relationship among the operations and their properties promote computational fluency. • Operations create relationships between numbers. • Money is used daily in real world experiences.

Knowledge, Skills, and Instructional Objectives:

7.1 Reinforce the names and values of coins and provide practice with coin exchanges

7.2 Reinforce counting and data collection skills through the use of a class collection

7.3 Deepen children's understanding of mathematical symbols and language through number stories

7.4 Provide experiences with building 2-dimensional and 3-dimensional shapes

7.5 Introduce the quarter
7.6 Reinforce addition skills through dice games
7.7 Reinforce and extend children's oral counting skills
7.8 Deepen children's understanding of place value by using craft sticks to represent 10s and 1s
7.9 Provide opportunities to explore equivalent names for numbers
7.10 Deepen children's understanding of number patterns and place value and provide number writing practice
7.11 Develop children's understanding of place value through a counting and recording routine
7.12 Use a game to reinforce the meaning of the addition and subtraction symbols
7.13 Develop children's understanding of place value through building and comparing 2-digit numbers
7.14 Reinforce the skill of ordering numbers
7.15 Deepen children's understanding of patterns by comparing patterns and identifying patterning rules
7.16 Provide additional experiences with name collections

Recommended Instructional Activities/Resources:

7.1 - *Money Cube* Game
- T330-331
- Playing *Money Cube*
- Counting to the Number of the Day

7.2 – Class Collections
- T332-335
- Collecting Objects
- Writing Number Models for Number Stories

7.3 – Class Number Story Book
- T336-339
- Creating Number Stories
- Playing 3-D Shape Games

7.4 – Marshmallow and Toothpick Shapes
- T340-341
- Making Geometric Shapes
- Dividing Groups in Half

7.5 – Introduction of the Quarter
- T342-343
- Exploring the Quarter
- Graphing Sums of Dice Rolls

7.6 – Dice Addition Games
- T344-345
- Playing Dice Addition Games
- Creating Number Stories

7.7 – Late-in-the-Year Counting
- T346-347
- Counting Forward and Backward from Higher Numbers
- Counting the Class Collection

7.8 – 10s and 1s with Craft Sticks
- T348-349
- Bundling Sticks

- Playing *Number-Grid Search*

7.9 – Name Collections with Craft Sticks
- T350-351
- Exploring Equivalent Names for Numbers
- Working with Attribute Blocks

7.10 – Number Scrolls
- T352-353
- Making Number Scrolls
- Estimating Quarters

7.11 – Decade Count
- T354-355
- Recording Decades While Counting
- Playing *Guess My Number* and Counting Backward

7.12 – *Plus or Minus Game*
- T356-357
- Playing the *Plus or Minus Game*
- Counting the Class Collection

7.13 – Double Digits with Dice
- T358-359
- Comparing 2-Digit Numbers
- Playing *Money Cube*

7.14 – Numbers in Sequence
- T360-361
- Ordering Numbers
- Graphing Lengths of Names and Discussing Probability

7.15 – "What's My Rule?" with Patterns
- T362-363
- Comparing Patterns
- Making Name Collections

7.16 – Bead String Name Collections
- T364-365
- Making Name Collections
- Playing *Monster Squeeze*

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century-Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design,

computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
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CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.P.D.1 - Describe characteristics of oneself, one's family, and others

Suggested Assessments/Benchmarks:
7.1 Ongoing teacher observation, *Money Cube* (Game play)
7.2 Ongoing teacher observation, Journal p15, Home Link
7.3 Ongoing teacher observation
7.4 Ongoing teacher observation, Home Link
7.5 Ongoing teacher observation
7.6 Ongoing teacher observation, Journal p17, *Dice Addition* (Game play)
7.7 Ongoing teacher observation, Home Link
7.8 Ongoing teacher observation, Journal p18
7.9 Ongoing teacher observation, Home Link
7.10 Ongoing teacher observation, Math Masters p111
7.11 Ongoing teacher observation
7.12 Ongoing teacher observation, *Plus or Minus Game* (Game play), Journal p15
7.13 Ongoing teacher observation, Journal p20
7.14 Ongoing teacher observation, Home Link
7.15 Ongoing teacher observation
7.16 Ongoing teacher observation, Journal p21

Unit: Time, Functions, Numeration - Section 8	Suggested Sequence: May

NJSLS:

K.C.C.1 Count to 100 by ones and by tens.

K.C.C.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

K.C.C.4.c: Understand that each successive number name refers to a quantity that is one larger.

K.CC.7 Compare two numbers between 1 and 10 presented as written numerals.

K.OA.1 Represent addition and subtraction up to 10 with objects, fingers, mental images, drawings2, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

K.O.A.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

K.O.A.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

K.O.A.5 Demonstrate fluency of addition and subtraction within 5.

K..MD.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

K.MD.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. *For example, directly compare the heights of two children and describe one child as taller/shorter.*

K.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

K.G.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*.

K.G.2 Correctly name shapes regardless of their orientations or overall size.

K.G.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three dimensional ("solid").

K.G.6 Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?"*

Essential Questions:	***Enduring Understandings:***
• Why is it important to understand the value of coins? • What are efficient ways to count? • What are different models of and models for addition and subtraction? • What computational tools are best suited to which circumstances? • Why is telling time important? • How can I tell time using both digital and analog clock faces? • How is thinking algebraically different from thinking arithmetically? • How are algebraic expressions used to analyze or solve problems? • What are efficient methods for finding sums and differences?	• Money is used daily in real world experiences. • Counting finds out the answer to "how many" in sets. • Computation involves taking apart and combining numbers using a variety of approaches. • Flexible methods of computation involve grouping numbers in strategic ways. • Standard units for measuring time provide common language for communication about time. • Real world situations can be represented symbolically and graphically. • Algebraic expressions and equations generalize relationships from specific cases. • Flexible methods of computation involve

• How does the position of a digit in a number affect its value?	grouping numbers in strategic ways. • Place value is based on groups of ten.

Knowledge, Skills, and Instructional Objectives:

8.1 Deepen children's understanding of place value through an exchange game
8.2 Develop children's sense of the duration of an hour
8.3 Introduce the analog clock, focusing on the hour hand
8.4 Develop "counting on" as an addition strategy
8.5 Introduce and provide practice with function machines
8.6 Develop children's number sense and ability to manipulate numbers through a mental math game
8.7 Introduce the $1 bill
8.8 Reinforce penny, dime, and dollar values and exchanges through a game
8.9 Reinforce the concept of equivalent names for numbers
8.10 Help children identify function rules and generate numbers that follow those rules
8.11 Introduce the minute hand on the analog clock
8.12 Provide practice with telling time to the hour with digital and analog clocks
8.13 Provide concrete experiences with figuring out missing numbers in equations
8.14 Introduce how to model number stories on a calculator
8.15 Introduce the use of nonstandard units on a pan balance
8.16 Introduce the $10 bill

Recommended Instructional Activities/Resources:

8.1 – *Ones, Tens, Hundreds Game*
- T380-381
- Playing the *Ones, Tens, Hundreds Game*
- Counting the Class collection

8.2 – How Long Is An Hour?
- T382-383
- Marking Hours
- Graphing Favorite Math Games

8.3 – The Hour-Hand Clock
- T384-387
- Making an Hour-Hand Clock
- Making Shapes and Structures

8.4 – *High Roller* Game
- T388-389
- Playing *High Roller*
- Fishing for Children: "What's My Rule?"

8.5 – Introduction to Function Machines
- T390-391
- Introducing the Function Machine
- Reviewing Coins

8.6 – *Number Gymnastic* Game
- T392-393
- Playing *Number Gymnastics*
- Studying Weather and Temperature Data

8.7 – Introduction of the $1 Bill
- T394-395
- Exploring the $1 Bill
- Reviewing Function Machines

8.8 – *One-Dollar* Game
- T396-397
- Playing the *One-Dollar* Game
- Making Name Collections

8.9 – Name Collection Posters
- T398-399
- Making Name Collection Posters
- Number Scrolling

8.10 – "What's My Rule?" with Numbers
- T400-401
- Solving "What's My Rule?" with Numbers
- Using the Hour-Hand Clock

8.11 – Hour-Hand, Minute-Hand Story
- T402-403
- Telling the "Hour-Hand, Minute-Hand Story"
- Using a Pan Balance

8.12 – *Time Match* Game
- T404-405
- Playing *Time Match*
- Dividing Wholes into Halves

8.13 – Missing Number Problems
- T406-407
- Solving Missing Number Pocket Problems
- Playing *I Spy*: Shapes and Patterns

8.14 – Number Stores with Calculators
- T408-409
- Telling Number Stories with Calculators
- Playing *Number Gymnastics* with Slates

8.15 – Pan Balance with Uniform Weights
- T410-413
- Weighing Objects
- Practicing Number Writing

8.16– Introduction of the $10 Bill
- T414-415
- Exploring the $10 Bill
- Measuring in Different Ways

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century-Cross-curricular Connections:

Technology:

8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.

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CRP11. Use technology to enhance productivity.

6.1.P.D.1 - Describe characteristics of oneself, one's family, and others

Suggested Assessments/Benchmarks:

8.1 Ongoing teacher observation, *Ones, Tens, Hundreds* (Game play)
8.2 Ongoing teacher observation, Home Link
8.3 Ongoing teacher observation, Math Masters p56, Journal p22
8.4 Ongoing teacher observation, *High Roller* (Game play)
8.5 Ongoing teacher observation
8.6 Ongoing teacher observation, *Number Gymnastics* (Game play), Home Link
8.7 Ongoing teacher observation, Journal p24
8.8 Ongoing teacher observation, *One Dollar Game* (Game play), Home Link
8.9 Ongoing teacher observation
8.10 Ongoing teacher observation
8.11 Ongoing teacher observation, Home Link
8.12 Ongoing teacher observation, *Time Match* (Game play)
8.13 Ongoing teacher observation, Journal p25
8.14 Ongoing teacher observation, Home Link
8.15 Ongoing teacher observation, Journal p26, Math Masters p63
8.16 Ongoing teacher observation

First Grade

Unit 1: **Establishing Routines**	**Suggested Sequence:** **Beginning of school year – September**

NJSLS:

1.O.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.[1]

1.0.A.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem

1. O.A.B.3 Apply properties of operations as strategies to add and subtract.[2] *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)(Students need not use formal terms for these properties)*

1. O.A.4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8. Add and subtract within 20.*

1. OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

1. NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

1. NBT.2.Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases

1. NBT.2a: 10 can be thought of as a bundle of ten ones – called a "ten."

1. NBT.2b: The numbers from 11 to19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.

1. NBT.2c: The numbers 10,20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

1. NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models (e.g., base ten blocks) or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

1. G.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size) ; build and draw shapes to possess defining attributes.

1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.[1]

Essential Questions:	***Enduring Understandings:***
• How do mathematical ideas interconnect and build on one another? • Why is number sense the foundation for all mathematics? • How can we compare and contrast numbers? • How can we decide when to use an exact number and when to use an estimate?	• Numerical fluency includes both the understanding of and the ability to appropriately use numbers. • One representation may sometimes be more helpful than another; and used together, multiple representations give a fuller understanding of a problem. • A quantity can be represented numerically in various ways. • Context is critical when using estimation.

Knowledge, Skills, and Instructional Objectives:

1.1 Introduce the count, the days of school, and job management routines.
1.2 Introduce number-line routines, and practice counting up on the number line
1.3 Introduce and provide practice using mathematical tools for drawing and counting
1.4 Introduce and provide practice with a slates routine, and practice writing the numbers 1 and 2
1.5 Provide practice finding the number that is 1 more or 1 less than a given number
1.6 Provide practice comparing pairs of numbers
1.7 Introduce tally marks for data representation
1.8 Provide experiences with equal-chance events
1.9 Introduce the calendar as a device for keeping track of the days in a month
1.10 Discuss and provide practice with rules for working in small groups
1.11 Introduce Explorations with manipulative materials
1.12 Introduce the routines for recording the day's weather and approximate temperature, and teach how a thermometer works
1.13 Provide practice telling and solving number stories
1.14 Assess children's progress on mathematical content through the end of Unit 1

Recommended Instructional Activities/ Resources:

1.1 – Daily Routines
- T14-17
- Getting Started
- Introducing First Grade Everyday Mathematics
- Counting the Days of School
- Assigning Classroom Jobs
- Taking Attendance
- Revisiting Rhymes & Songs
- Options for Individualizing
- Home Link – Family Introduction

1.2 – Investigating the Number Line
- T18-21
- Getting Started
- Playing Number Line Squeeze
- Finding the Number of Children Who Are Absent
- Revisiting Rhymes and Songs
- Options for Individualizing

1.3 – Tools for Doing Mathematics
- T22-25
- Getting Started
- Exploring the Tool Kits
- Using the Pattern-Block Template
- Playing the Penny-Dice Game
- Revisiting Rhymes & Songs
- Options for Individualizing

1.4 – Number-Writing Practice
- T26-29
- Getting Started

- Introducing Slates as a Classroom Tool]
- Introducing Math Journal 1
- Writing the Numbers 1 and 2
- Playing the Penny-Dice Game
- Options for Individualizing

1.5 – One More, One Less
- T3033
- Getting Started
- Telling “One More” and “One Less” Stories
- Finding “One More” and “One Less” Using Pennies
- Writing the Numbers 1 and 2
- Options for Individualizing

1.6 – Comparing Numbers
- T34-38
- Getting Started
- Comparing and Ordering Numbers
- Introducing Top-It
- Playing Number Line Squeeze
- Options for Individualizing

1.7 – Recording Tally Counts
- T39-42
- Getting Started
- Introducing Tally Marks
- Making a Tally Chart to Count Children’s Pets
- Writing the Numbers 3 & 4
- Playing Top-It
- Options for Individualizing

1.8 – Investigating Equally Likely Outcomes
- T43-46
- Getting Started
- Playing the Dice-Roll and Tally Game
- Writing the Numbers 3 & 4
- Options for Individualizing

1.9 – The Calendar
- T47-50
- Getting Started
- Introducing the Class Calendar
- Filling in the Calendar for the Month
- Writing the Numbers 5 & 6
- Options for Individualizing

1.10 – Working in Small Groups
- T51-55
- Getting Started
- Extending Partner Expectations to Small Groups
- Counting Pennies in Small Groups
- Playing Top-It in Small Groups

- Writing the Numbers 5 & 6
- Options for Individualizing

1.11 – Explorations: Exploring Math Materials

- T56-59
- Getting Started
- Introducing Explorations
- Exploring with Pattern Blocks, Base-10 Blocks, and Geoboards
- Playing Number-Line Squeeze or Top-It
- Writing the Numbers 1-6
- Options for Individualizing

1.12 – Weather and Temperature Routines

- T60-66
- Getting Started
- **DAY 1**
- Introducing the Weather Routine
- Introducing the Thermometer
- **DAY 2**
- Discussing the Fahrenheit Thermometer Scale
- Introducing the Daily Temperature Routine
- Coloring the Zones on a Fahrenheit Thermometer
- Drawing a Picture to Illustrate a Temperature
- Making a Class Tally Count
- Options for Individualizing

1.13 – Number Stories

- T67-70
- Getting Started
- Telling Simple Number Stories
- Sharing Simple Number Stories Number Writing
- Options for Individualizing

1.14 – Unit 1 Review and Assessment

- T71-75
- Getting Started
- Home Link 1.14 – Unit 2 Family Letter

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

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Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
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CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.4.A.15 - Explain how and why it is important that people from diverse cultures collaborate to find solutions to community, state, national, and global challenges
6.1.4.A.11 - Explain how the fundamental rights of the individual and the common good of the country depend upon all citizens exercising their civic responsibilities at the community, state, national, and global levels.

Suggested Assessments/ Benchmarks:
1.1 Mental Math, Ongoing Observation
1.2 Monster Squeeze Game Play-Teacher Observation
1.3 Teacher Observation, Penny-Dice Game Play
1.4 Journal p1, Slates
1.5 Bunny-Hop Game, Teacher Observation, Mental Math
1.6 Slates, Teacher Observation, Exit Slip, Top-It Game Play, Math Masters p9
1.7 Slates, Teacher Observation
1.8 Journal p3, Slates, Mental Math
1.9 Teacher-Student Q&A, Journal p4
1.10 Top-It Game, Teacher Observation, Mental Math
1.11 Math Masters p13, Teacher Observation and Discussion
1.12 Teacher-Student Q&A, Journal p6, Home Link
1.13 Exit Slip, Teacher-Student Q&A, Home Link, Teacher Observation
1.14 Oral, Slate, Self, and Written Assessments, Oral Response

Unit: 2 **Everyday Uses of Numbers**	**Suggested Sequence:** **October**

NJSLS:

1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

1. OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

1. OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).

1.OA.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.*

1. NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

1.NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models (e.g., base ten blocks) or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

1. MD.3 Tell and write time in hours and half-hours using analog and digital clocks.

1. MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Essential Questions:	***Enduring Understandings:***
• How do mathematical ideas interconnect and build on one another? • Why is number sense the foundation for all mathematics? • How can we compare and contrast numbers? • How can we decide when to use an exact number and when to use an estimate? • How do operations affect numbers? • How can we use math information to choose an operation? • What makes a computational strategy both effective and efficient?	• Numerical fluency includes both the understanding of and the ability to appropriately use numbers. • One representation may sometimes be more helpful that another; and used together, multiple representations give a fuller understanding of a problem. • A quantity can be represented numerically in various ways. • Context is critical when using estimation. • Computational fluency includes understanding the meaning and the appropriate use of numerical operations. • The magnitude of numbers affects the outcome of the operations on them.

Knowledge, Skills, and Instructional Objectives:

2.1 Provide practice counting up and back on the number grid
2.2 Guide exploration of the uses of numbers; introduce the parts of telephone numbers
2.3 Guide exploration of the compliments of 10; and to introduce the Math Boxes routine
2.4 Introduce the need for unit labels for number; to introduce calculators
2.5 Introduce the analog clock
2.6 Introduce the division of the day into A.M. and P.M. times; to provide practice telling time to the hour; and to develop a sense of the duration of a minute
2.7 Provide experiences comparing lengths of objects; practice drawing straight lines with a straightedge; develop familiarity with dominoes
2.8 Introduce pennies and cents notation; provide practice recording numbers of pennies; reinforce comparing numbers
2.9 Introduce nickels; and to provide practice exchanging pennies for nickels
2.10 Provide practice finding the values of combinations of nickels and pennies
2.11 Introduce number models for change-to-more situations
2.12 Broaden experiences with extending number models to include change-to-less situations
2.13 Provide practice making up and solving number stories; to review counting money
2.14 Assess children's progress on mathematical content through the end of Unit 2

Recommended Instructional Activities/ Resources:

2.1 – Number Grids
- T88-91
- Getting Started
- Playing Rolling for 50
- Introducing Number-Grid Counting
- Playing Top-It
- Options for Individualizing

2.2 – Numbers All Around
- T92-96
- Getting Started
- Discussing Uses of Numbers
- Recording Personal Information

- Parts of Telephone Numbers
- Writing the Numbers 7 & 8
- Options for Individualizing

2.3 – Complements of 10
- 97-100
- Getting Started
- Playing Two-Fisted Penny Addition
- Introducing the Math Boxes routine
- Math Boxes
- Practicing Numbers 7 & 8
- Options for Individualizing

2.4 – Unit Labels for Numbers
- T101-105
- Getting Started
- Labeling Numbers with Units
- Introducing the Unit Box
- Using the Unit Box in a Counting Routine
- Introducing Calculators
- Writing the Numbers 9 & 10
- Math Boxes 2.4
- Options for Individualizing

2.5 – Analog Clocks
- T106-110
- Getting Started
- Discussing Tools for Telling Time
- Discussing the Position of the Hour Hand
- Estimating the Time Shown
- Practicing the Numbers 9 & 10
- Math Boxes 2.5
- Options for Individualizing

2.6 – Telling Time to the Hour
- T111-115
- Getting Started
- Reviewing Clocks
- Introducing the Division of the 24-Hour Day
- Making a Clock
- Telling Time to the Nearest Hour
- Getting a Sense of the Duration of a Minute
- Math Boxes 2.6
- Options for Individualizing

2.7 – Explorations: Exploring Lengths, Straightedges, and Dominoes
- T116-119
- Getting Started
- Explorations: A: Estimating the Relative Lengths of Objects
- B: Making a Star
- C: Sorting Dominoes

- Playing Two-Fisted Penny Addition or Rolling for 50
- Math Boxes 2.7
- Options for Individualizing

2.8 - Pennies
- T120-124
- Getting Started
- Examining the Penny
- Introducing the Cents Notation
- Solving Penny Grab Problems
- Math Boxes 2.8
- Options for Individualizing

2.9 - Nickels
- T125-129
- Getting Started
- Finding the Value of a Collection of Nickels
- Exchanging Pennies for Nickels
- Completing a Connect-the-Dots Picture
- Math Boxes 2.9
- Options for Individualizing

2.10 – Counting Nickels and Pennies
- T130-134
- Getting Started
- Counting Nickels and Pennies
- Practicing Coin Counts
- Playing Penny-Nickel Exchange
- Math Boxes 2.10
- Options for Individualizing

2.11 – Number Models
- T135-139
- Getting Started
- Introducing Penny-Drop Addition
- Introducing Number Models
- Playing Nickel/Penny Grab
- Math Boxes 2.11
- Options for Individualizing

2.12 – Subtraction Numbers Models
- T140-143
- Getting Started
- Introducing Subtraction Number Models
- Playing High Roller
- Math Boxes 2.12
- Options for Individualizing

2.13 – Number Stories
- T144-148
- Getting Started
- Solving Number Stories

- Solving More Number Stories
- Telling Time
- Math Boxes 2.13
- Options for Individualizing

2.14 – Unit 2 review and Assessment

- T149-153
- Getting Started
- Assess Progress
- Oral, Slate and Written Assessments
- Play Two- Fisted Penny Addition
- Math Boxes 2.14
- Family Letter Unit 3

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.4.A.15 - Explain how and why it is important that people from diverse cultures collaborate to find solutions to community, state, national, and global challenges
6.1.4.A.11 - Explain how the fundamental rights of the individual and the common good of the country depend upon all citizens exercising their civic responsibilities at the community, state, national, and global levels.

Suggested Assessments/ Benchmarks:
2.1 Rolling for 50 Game, Mental Math, Teacher Observation
2.2 Teacher Observation, Journal p8, Teacher-Student Q&A
2.3 Teacher-Student Q&A, Exit, Slip, Math Boxes
2.4 Teacher-Student Q&A, Calculators, Teacher Observation

2.5 Teacher-Student Q&A, Clocks, Teacher Observation 2.6 Teacher-Student Q&A, Clocks, Journal p14, Teacher Observation 2.7 Math Masters p35, 36, 37, Teacher Observation 2.8 Teacher-Student Q&A, Math Master p350, Penny Plate 2.9 Teacher-Student Q&A, Journal p18, Teacher Observation 2.10 Journal p20, Home Link 2.11 Teacher-Student Q&A, Teacher Observation 2.12 Teacher-Student Q&A, Teacher Observation 2.13 Journal p25, Teacher Observation, Home Link 2.14 Slate, Oral, Self, and Written Assessments, Oral Response

Unit: 3 **Visual Patterns, Number Patterns and Counting**	**Suggested Sequence:** **November**

NJSLS:

1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

1. OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

1.OA.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = ☐ – 3, 6 + 6 = ☐.*

1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models (e.g., base ten blocks) or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one

adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
1. MD.3 Tell and write time in hours and half-hours using analog and digital clocks.
1. MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

Essential Questions:	***Enduring Understandings:***
• How can patterns, relations, and functions be used as tools to best describe and help explain real-life situations? • How can changes be represented mathematically? • How are patterns of change related to the behavior of functions? • How can the collection, organization, interpretation, and display data be used to answer questions?	• A quantity can be represented numerically in a variety of ways. • Algebraic representation can be used to generalize patterns and relationships. • The symbolic language of algebra is used to communicate and generalize the patterns in mathematics. • Patterns and relationships can be represented graphically, numerically, symbolically, or verbally. • The message conveyed by the data depends on how the data is collected, represented, and summarized.

Knowledge, Skills, and Instructional Objectives:
3.1 Guide the exploration and extension of visual patterns
3.2 Guide exploration of even and odd number patterns
3.3 Guide exploration of skip-counting patterns on the number grid
3.4 Guide exploration of even and odd numbers; covering shapes with pattern blocks; and creating and continuing repeating patterns
3.5 Review basic number-line concepts; to provide practice counting on the number line
3.6 Introduce addition and subtraction on the number line
3.7 Review basic concepts of telling time; and to provide practice telling time to the hour and the half-hour
3.8 Introduce the Frames-and Arrows routine
3.9 Introduce Frames-and-Arrows problems in which the "arrow rule" is missing
3.10 Introduce counting up and back on the calculator
3.11 Introduce the dime; introduce dollars-and-cents notation; to provide practice exchanging pennies, nickels, and dime
3.12 Provide practice finding the values of collections of dimes, nickels, and pennies
3.13 Improve line plots
3.14 Explore domino-dot patterns; and to provide practice for all of the basic addition facts
3.15 Assess children's progress on mathematical content through the end of Unit 3

Recommended Instructional Activities/ Resources:
3.1 – Visual Patterns
- T168-172
- Getting Started
- Introducing Visual Patterns
- Finding Patterns in the Classroom

- Creating Craft-Stick Patterns
- Extending Patterns
- Playing Before and After
- Math Boxes 3.1
- Options for Individualizing

3.2 – Even and Odd Number Patterns

- T173-177
- Getting Started
- Introducing Even and Odd Numbers
- Exploring Even and Odd Number Patterns
- Identifying Even and Odd Numbers
- Playing Penny-Nickel Exchange
- Math Boxes 3.2
- Options for Individualizing

3.3 – Number-Grid Patterns

- T178-182
- Getting Started
- Exploring Skip-Counting Patterns on a Number Grid
- Exploring the 3s Pattern
- Even/Odd Number Pattern
- Math Boxes 3.3
- Options for Individualizing

3.4 – Exploring Even & Odd Numbers, Covering Shapes, and Patterns

- T183-186
- Getting Started
- Explorations: A – Sorting Dominoes by Odd and Even Numbers of Dots;
- B – Covering Shapes with Pattern Blocks
- C – Exploring Patterns with Pattern Blocks
- Playing a Math Game
- Math Boxes 3.4
- Options for Individualizing

3.5 – Counting on the Number Line

- T187-191
- Getting Started
- Reviewing Basic Number-line Concepts
- Reviewing Skip Counting on Number Lines
- Counting Hops Up and Back on the Number Line
- Creating and Continuing Patterns
- Math Boxes 3.5
- Options for Individualizing

3.6 – Adding and Subtracting on the Number Line

- T192-195
- Getting Started
- Introducing Addition on the Number Line
- Introducing Subtraction on the Number Line
- Adding and Subtracting on the Number Line

- Math Boxes 3.6
- Options for Individualizing

3.7 – Telling Time to the Half-Hour
- T196-200
- Getting Started
- Revisiting Telling Time on a Analog Clock
- Introducing Telling Time to the Half-Hour
- Finding Missing Numbers on Number Lines
- Math Boxes 3.7
- Options for Individualizing

3.8 – Introduction to the Frames-and-Arrows Routines
- T201-205
- Getting Started
- Introducing the Frames-and-Arrows Routine
- Solving Frames-and-Arrows Problems
- Telling Time
- Math Boxes 3.8
- Options for Individualizing

3.9 – More Frames-and-Arrows Problems
- T206-209
- Getting Started
- Finding the Arrow Rule
- Making up Frames-and-Arrows Problems
- Solving Frames-and-Arrows Problems
- Adding on the Number Grid
- Math Boxes 3.9
- Options for Individualizing

3.10 – Counting with a Calculator
- T210-215
- Getting Started
- Counting Up and Back with a Calculator
- Counting Up, Starting from Any Number
- Counting with a Calculator
- Subtracting on the Number Grid
- Math Boxes 3.10
- Options for Individualizing

3.11 - Dimes
- T216-221
- Getting Started
- Introducing Dollars-and-Cents Notation
- Exchanging Pennies and Nickels for Dimes
- Completing Frames-and-Arrows Diagrams
- Math Boxes 3.11
- Options for Individualizing

3.12 – Counting Dimes, Nickels, and Pennies
- T222-226

- Getting Started
- Counting collections of the Same Kind of Coin
- Counting Combinations of Dimes, Nickels, and Pennies
- Counting Combinations of Dimes, Nickels, and Pennies
- Math Boxes 3-12
- Options for Individualizing

3.13 – Data Day
- T227-230
- Getting Started
- Making a Line Plot
- Looking for Even/Odd Number Patterns in a Calendar
- Math Boxes 3.13
- Options for Individualizing

3.14 – Domino Addition
- T231-235
- Getting Started
- Exploring Dot Patterns on Halves of Dominoes
- Introducing Number Combinations on Entire Dominoes, Not on Isolated Halves
- Playing Domino Top-It
- Finding the Total Numbers of Dots on Dominoes
- Math Boxes 3.14
- Options for Individualizing

3.15 – Unit 3 Review and Assessment
- T236-241
- Getting Started
- Math Boxes 3.15
- Home Link 3.15 – Unit 4 Family Letter

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.4.A.15 - Explain how and why it is important that people from diverse cultures collaborate to find solutions to community, state, national, and global challenges
6.1.4.A.11 - Explain how the fundamental rights of the individual and the common good of the country depend upon all citizens exercising their civic responsibilities at the community, state, national, and global levels.

Suggested Assessments/ Benchmarks:
3.1 Teacher Observation, Exit Slip, Journal 28
3.2 Teacher Observation, Journal p30, Home Link
3.3 Journal p32, Teacher Observation, Home Link
3.4 Math Masters p57-62, Teacher Observation, Math Box
3.5 Discussion, Journal p35, Teacher Observation, Home Link
3.6 Teacher-Student Q&A, Slates, Exit Slip, Journal p37, Home Link
3.7 Teacher Observation, Teacher-Student Q&A, Journal p39, Home Link
3.8 Mental Math, Teacher-Student Q&A—math masters p312, Teacher Observation, Journal p41
3.9 Math Masters p312, Teacher Observation, Journal p43, Home Link p77
3.10 Teacher Observation, calculators
3.11 Teacher Observation, Journal p46, Teacher-Student Q&A
3.12 Journal p48, Teacher Observation, Home Link
3.13 Teacher-Student Discussion, Home Link
3.14 Domino Top-It Game, Journal p51, Teacher Observation
3.15 Slate, Oral, Self, and Written Assessments, Open Response

Unit: 4 **Measurement and Basic Facts**	**Suggested Sequence:** **December**

NJSLS:

1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

1.OA.B.3 Apply properties of operations as strategies to add and subtract.3 *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.) (Students need not use formal terms for these properties)*

1.NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

1.MD.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.

1.MD.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*

1.MD.3 Tell and write time in hours and half-hours using analog and digital clocks.

1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Essential Questions:	***Enduring Understandings:***
• How can measurements be used to solve problems? • How do operations affect numbers? • What makes a computational strategy both effective and efficient?	• Everyday objects have a variety of attributes, each of which can be measured in many ways. • What we measure affects how we measure it. • Measurements can be used to describe, compare, and make sense of phenomena. • Computational fluency includes understanding the meaning and the appropriate use of numerical operations. • The magnitude of numbers affects the outcome of the operations on them.

Knowledge, Skills, and Instructional Objectives:

4.1 Introduce the Math Message routine; to review thermometers; and to introduce reading temperatures to the nearest two degrees

4.2 Provide practice measuring and comparing lengths using nonstandard units

4.3 Provide practice measuring with a nonstandard unit and with the standard foot; and to facilitate understanding of the need for standard units

4.4 Introduce the inch as a standard unit of length; and to practice measuring to the nearest inch

4.5 Provide practice estimating and measuring the lengths of objects in inches

4.6 Provide practice using a tape measure to measure curved and flat objects in inches

4.7 Measure children's heights; to provide experiences making a bar graph; to guide the exploration of 2-dimensional shapes; and to develop familiarity with base-10 blocks

4.8 Review telling time on the hour and the half-hour; and to introduce telling time on the quarter-hour

4.9 Facilitate the investigation of timelines

4.10 Introduce scrolls; provide opportunities to make a number scroll for numbers to 100 & up

4.11 Introduce addition facts and fact power
4.12 Provide practice with addition facts
4.13 Assess children's progress on mathematical content through the end of Unit 4

Recommended Instructional Activities/ Resources:

4.1 – Math Message and Reading a Thermometer
- T254-259
- Getting Started
- Introducing the Math Message Routine
- Math Message Follow-Up
- Reviewing Thermometers and How to Read Them
- Reading Temperatures to the Nearest Ten Degrees
- Reading Temp. to the Nearest Two Degrees
- Comparing Numbers while Playing Domino Top-It
- Math Boxes 4.1
- Options for Individualizing

4.2 – Nonstandard Linear Measurements
- T260-264
- Getting Started
- Math Message Follow-Up
- Measuring Things with Fingers, Hands, Feet, and Arms
- Comparing Individual Heights to Things in the Classroom
- Two-Fisted Penny Addition
- Math Boxes 4.2
- Options for Individualizing

4.3 – Personal "Foot" and Standard Foot
- T265-269
- Getting Started
- Math Message Follow-Up
- Measuring with Construction-Paper Cutouts of Children's Feet
- Measuring with a Standard Foot-Long Foot
- Playing Coin Dice
- Math Boxes 4.3
- Options for Individualizing

4.4 – The Inch
- T270-275
- Getting Started
- Math Message Follow-Up
- Introducing the Inch as a Standard Unit of Length
- Measuring in Inches with the Cutout Ruler
- Playing Time Match
- Math Boxes 4.4
- Options for Individualizing

4.5 – The 6-Inch Ruler
- T276-280
- Getting Started

- Math Message Follow-Up
- Estimating the Length of an Object
- Measuring Objects with the 6-Inch Ruler
- Measuring and Drawing Line Segments
- Playing Domino Top-It
- Math Boxes 4.5
- Options for Individualizing

4.6 – Measuring with a Tape Measure

- T281-284
- Getting Started
- Math Message Follow-Up
- Introducing Tape Measures
- Measuring around and across Things
- Measuring Parts of the Body
- Finding Totals in Domino Dot Patterns
- Math Boxes 4.6
- Options for Individualizing

4.7 – Exploring Data, Shapes, and Base-10 Blocks

- T285-295
- Getting Started
- Math Message Follow-Up
- Explorations: A – Measuring Children's Heights and Making a Line Plot; B – Exploring Shapes on the Geoboard; C – Building Structures with Base-10 Blocks
- Making a Bar Graph and Finding a "Typical" Height
- Sorting Dominoes by the Total Number of Dots
- Math Boxes 4.7
- Options for Individualizing

4.8 – Telling Time on the Quarter-Hour

- T291-295
- Getting Started
- Math Message Follow-Up
- Reviewing Hour and Half-hour Times
- Telling Time to the Quarter Hour
- Practice Telling Time on the Quarter-Hour and Half-Hour
- Playing Domino Top-It
- Two-Fisted Penny Addition Using 9 and 17 Pennies
- Math Boxes 4.8
- Options for Individualizing

4.9 - Timelines

- T296-300
- Getting Started
- Math Message Follow-Up
- Introducing Timelines
- Making a Timeline
- Showing Times on the Quarter Hour
- Domino Parts and Totals

- Math Boxes 4.9
- Options for Individualizing

4.10 – Number Scrolls
- T301-306
- Getting Started
- Math Message Follow-Up
- Introducing Scrolls
- Filling in a 100-Number Grid
- Constructing a Number Scroll
- Exploring Base-10 Blocks
- Playing Time Match with Quarter-Hours
- Math Boxes 4.10
- Options for Individualizing

4.11 – Introducing Fact Power
- T307-311
- Getting Started
- Math Message Follow-Up
- Introducing Addition Facts
- Discussing Fact Power
- Finding Sums
- Reading and Setting Temperatures
- Math Boxes 4.11
- Options for Individualizing

4.12 – Good Fact Habits
- T312-316
- Getting Started
- Math Message Follow-Up
- Reinforcing Fact Reflexes as “Habits” with Choral Response
- Introducing Shaker Addition Top-It
- Coloring by Number
- Bundling Craft Sticks
- Math Boxes 4.12
- Options for Individualizing

4.13 – Unit 4 Review and Assessment
- T317-321
- Getting Started
- Math Message Follow-Up
- Math Boxes 4.13
- Home Link 4.13 – Unit 5 Family Letter

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.

8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.4.A.15 - Explain how and why it is important that people from diverse cultures collaborate to find solutions to community, state, national, and global challenges
6.1.4.A.11 - Explain how the fundamental rights of the individual and the common good of the country depend upon all citizens exercising their civic responsibilities at the community, state, national, and global levels.

Suggested Assessments/ Benchmarks:
4.1 Teacher-Student Q&A, Journal p54, Home Link
4.2 Journal p56, 57, Teacher Observation
4.3 Journal p60, Teacher Observation
4.4 Teacher Observation, Journal p62, Math Message, Home Link
4.5 Math Message, Teacher Observation, Journal p64
4.6 Math Message, Journal p66, Home Link
4.7 Math Message, Journal p69, Math Masters p315, 102, Teacher Observation
4.8 Teacher-Student Q&A, Teacher Observation, Journal p71, Home Link
4.9 Journal p73, Teacher-Student Q&A, Home Link
4.10 Math Masters p109,110, Teachers Observation, Home Link
4.11 Journal 77, Teacher Observation, Teacher-Student Q&A, Math Message
4.12 Math Message, Math Masters p353, Shaker Addition Top-It Game, Teacher Observation
4.13 Slate, Oral, Self, and Written Assessments, Oral Response

Unit: 5 **Place Value, Number Stories and Basic Facts**	**Suggested Sequence:** **January**

NJSLS:

1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

1.OA.B.3 Apply properties of operations as strategies to add and subtract.3 *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.) (Students need not use formal terms for these properties)*

1.OA.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.*

1.OA.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = ☐ – 3, 6 + 6 = ☐.*

1.NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

1.NBT.2.a: 10 can be thought of as a bundle of ten ones — called a “ten.”

1.NBT.2.b: The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.

1.NBT.2.c: The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

1.NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit

number and a multiple of 10, using concrete models (e.g., base ten blocks) or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Essential Questions:	***Enduring Understandings:***
• How can we compare and contrast numbers? • How do operations affect numbers? • What makes a computational strategy both effective and efficient? • How can we decide when to use an exact number and when to use an estimate? • How can change be represented mathematically?	• Numerical fluency includes both the understanding of and the ability to appropriately use numbers. • Computational fluency includes understanding the meaning and the appropriate use of numerical operations. • The magnitude of numbers affects the outcomes of the operations on them. • One representation may sometimes be more helpful than another; and, used together, multiple representations give a fuller understanding of a problem. • Context is critical when using estimation.

Knowledge, Skills, and Instructional Objectives:

5.1 Provide experiences with place-value concepts for tens and ones
5.2 Provide experiences investigating place-value digit patterns
5.3 Introduce the relation symbols < and >
5.4 Develop the concept of area by counting units; to provide experiences weighing objects with a pan balance; and to provide practice with rational counting
5.5 Introduce addition of 2-digit number
5.6 Provide practice with more than and less than number stories; and to provide experiences with writing number models for number stories
5.7 Introduce number stories that involve finding differences
5.8 Provide practice making up and solving a variety of number stories involving relations, addition, and subtraction
5.9 Provide experience with sums generated by rolling pairs of dice
5.10 Introduce the turn-around rule for addition
5.11 Provide practice with some easily mastered addition facts; the +0, +1, and doubles facts, as well as facts with sums of 10
5.12 Introduce the "What My Rule?" routine
5.13 Provide experience with finding the output for given rules and input numbers
5.14 Assess children's progress on mathematical content through the end of Unit 5

Recommended Instructional Activities/ Resources:

5.1 – Place Value: Tens and Ones
- T334-338
- Getting Started
- Math Message Follow-Up
- Naming Numbers with Base-10 Blocks

- Making Exchanges with Base-10 Blocks
- Numbers for Collections of Base-10 Blocks
- Solving Frames-and-Arrows Diagrams
- Math Boxes 5.1
- Options for Individualizing

5.2 – Place Value with Calculators

- T339-344
- Getting Started
- Math Message Follow-Up
- Adding 1 to 99
- Investigating Digit Patterns in Counts by 1s
- Investigating Digit Patterns in Counts by 10s
- The Role of Place in the Value of Digits
- Playing Two-Fisted Penny Addition
- Math Boxes 5.2
- Options for Individualizing

5.3 – Relations: Greater Than, Less Than, and Equal To

- T345-349
- Getting Started
- Math Message Follow-Up
- Introducing the > and < Relation Symbols
- Playing Top-It with Relation Symbols
- Playing the Tens-and-Ones Trading Game
- Math Boxes 5.3
- Options for Individualizing

5.4 – Exploring Area, Weight, and Counting

- T350-354
- Getting Started
- Math Message Follow-Up
- Covering a Surface
- Explorations: A – Estimating and finding the Area of a Surface; B – Finding Sets of Objects that Weight the Same; C – Counting Large Numbers of Pennies
- Estimating Approximate Area
- Playing a Math Game
- Math Boxes 5.4
- Options for Individualizing

5.5 – Animal Weights

- T355-359
- Getting Started
- Math Message Follow-Up
- Using Base-10 Blocks to Find Total Weight
- Finding Total Weight
- Playing Shaker Addition Top-It
- Math Boxes 5.5
- Options for Individualizing

5.6 – *More Than* and *Less Than* Number Stories

- T360-364
- Getting Started
- Math Message Follow-Up
- Introducing Number Models for Relation Number Stories
- Using < and > in Number Models
- Ordering Animal Cards by Weight
- Math Boxes 5.6
- Options for Individualizing

5.7 – Comparison Number Stories

- T365-369
- Getting Started
- Math Message Follow-Up
- Finding How Much More or Less
- Playing the Difference Game
- Playing Domino Top-It
- Math Boxes 5.7
- Options for Individualizing

5.8 – Solving Number Stories

- T370-373
- Getting Started
- Math Message Follow-Up
- Solving Number Stories Involving
- Addition and Subtraction
- Making Up and Solving Number Stories
- Using the Number Line to Find Differences
- Math Boxes 5.8
- Options for Individualizing

5.9 – Dice Sums

- T374-377
- Getting Started
- Math Message Follow-Up
- Investigating Frequency of Sums of Dice Rolls
- Comparing Values of Sets of Base-10 Blocks
- Math Boxes 5.9
- Options for Individualizing

5.10 – Turn-Around Facts

- T378-382
- Getting Started
- Math Message Follow-Up
- Playing the Turn-Around Facts Game
- Discussing Patterns in the Turn-Around Facts Record
- Playing the Magic Bag Game
- Math Boxes 5.10
- Options for Individualizing

5.11 –“Easy” Facts

- T383-387
- Getting Started
- Math Message Follow-Up
- +0 and +1 Fact Patterns
- Doubles Facts and Facts Whose Sums Are 10
- Introducing Beat the Calculator
- Measuring to the Nearest Inch
- Math Boxes 5.11
- Options for Individualizing

5.12 – "What's My Rule?"

- T388-392
- Getting Started
- Math Message Follow-Up
- Introducing the "What's My Rule?" Routine
- Solving "What's My Rule?" Problems
- Playing the Tens-and-Ones Trading Game
- Math Boxes 5.12
- Options for Individualizing

5.13 – Applying Rules

- T393-397
- Getting Started
- Math Message Follow-Up
- Applying Rules
- Finding and Applying Rules
- Playing Penny-Nickel-Dime Exchange
- Math Boxes 5.13
- Options for Individualizing

5.14 – Unit 5 review and Assessment

- T398-401
- Getting Started
- Math Message Follow-Up
- Math Boxes 5.14
- Home Link 5-14 Unit 6 Family Letter

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.4.A.15 - Explain how and why it is important that people from diverse cultures collaborate to find solutions to community, state, national, and global challenges
6.1.4.A.11 - Explain how the fundamental rights of the individual and the common good of the country depend upon all citizens exercising their civic responsibilities at the community, state, national, and global levels.

Suggested Assessments/ Benchmarks:
5.1 Math Message, Journal p81, 82, Teacher Observation, Home Link
5.2 Mental Math, Math Message, Teacher-Student Q&A, Teacher Observation
5.3Teacher Observation, Teacher-Student Q&A, Top-It Game with Relation Symbols, Home Link
5.4 Math Message, Math Master p125,126, 127, 128, 129, Teacher Observation
5.5 Math Message, Teacher Observation, Teacher-Student Q&A
5.6 Math Message, Journal p89,90, Teacher Observation
5.7 Math Message, Journal p92, Difference Game, Exit Slip, Teacher Observation
5.8 Math Message, Teacher-Student Q&A, Journal p94, Home Link
5.9 Journal p96, Teacher Observation
5.10 Teacher-Student Q&A, Journal p96,98
5.11 Math Message, Journal p101, Beat the Calculator Game, Home Link
5.12 Teacher Observation, Journal p103, Home Link
5.13 Teacher Observation, Journal p105, Math Message
5.14 Slate, Oral, Written, and Self Assessments, Oral Response

Unit: 6 **Developing Fact Power**	**Suggested Sequence:** **February**

NJSLS:
1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.OA.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.OA.B.3 Apply properties of operations as strategies to add and subtract.3 *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers*

can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.) (Students need not use formal terms for these properties)

1. OA.4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.*
1. OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).
1. OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).
1.OA.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.*
1.OA.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = ☐ – 3, 6 + 6 = ☐.*
1. NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
1. NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:
1. NBT.2.a: 10 can be thought of as a bundle of ten ones — called a "ten."
1.NBT.2.c: The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
1.MD.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*
1. MD.3 Tell and write time in hours and half-hours using analog and digital clocks.
1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Essential Questions:	***Enduring Understandings:***
• How do operations affect numbers? • What makes a computational strategy both effective and efficient? • How can measurements be used to solve problems?	• Computational fluency includes understanding the meaning and the appropriate use of numerical operations. • The magnitude of numbers affects the outcome of the operations on them. • Everyday objects have a variety of attributes, each which can be measured in many ways. • What we measure affects how we measure it. • Measurements can be used to describe, compare, and make sense of phenomena.

Knowledge, Skills, and Instructional Objectives:

6.1 Provide experience exploring patterns in sums of two dice; and to introduce the Addition/Subtraction Facts Table

6.2 Introduce name-collection boxes as devices for collecting equivalent names for numbers

6.3 Introduce addition/subtraction fact families
6.4 Introduce Fact Triangles
6.5 Provide experience revisit the relationship between addition and subtraction
6.6 Introduce the centimeter as a unit of measure in the metric system; and to provide experience measuring and drawing line segments to the nearest centimeter
6.7 Develop readiness for fractions; to provide practice with addition facts; and to provide for the exploration of various shapes of triangles
6.8 Provide an extension for the "What's My Rule?" routine which includes finding missing input numbers
6.9 Provide experience finding the value of collections of quarters, dimes, nickels, and pennies; and showing money amounts with coins
6.10 Provide experience identifying the number of minutes around the face of an analog clock; and to introduce digital time
6.11 Introduce *My Reference Book*
6.12 Introduce the statistical landmarks *range* and *middle value*; and to provide practice collecting data and making bar graphs
6.13 Assess children's progress on mathematical content through the end of Unit 6

Recommended Instructional Activities/ Resources:
6.1 – The Addition/Subtraction Fact Tables
- T486-491
- Getting Started
- Math Message Follow-Up
- Making a Dice-Throw Record of Facts
- Introducing the Addition/Subtraction Facts Table
- Introducing Addition Top-It
- Copying Height Information from Math Journal 1 to Math Journal 2
- Math Boxes 6.1
- Options for Individualizing

6.2 – Equivalent Names
- T492-497
- Getting Started
- Math Message Follow-Up
- Discussing Equivalent Names in Everyday Life
- Illustrating Equivalence Using a Pan Balance
- Introducing Name-Collection Boxes
- Finding Equivalent Names for Numbers
- Using the Addition/Subtraction Facts Table
- Playing Addition Top-It
- Math Boxes 6.2
- Options for Individualizing

6.3 – Fact Families
- T498-502
- Getting Started
- Math Message Follow-Up
- Introducing Addition/Subtraction Fact Families
- Writing Addition/Subtraction Fact Families

- Investigating Equivalent Names
- Math Boxes 6.3
- Options for Individualizing

6.4 – Fact Triangles
- T503-508
- Getting Started
- Math Message Follow-Up
- Introducing Fact Triangles
- Generating Fact Families
- Playing Beat the Calculator
- Playing the Fact Power Game
- Options for Individualizing

6.5 – Using the Addition/Subtraction Facts Tables for Subtraction
- T509-512
- Getting Started
- Math Message Follow-Up
- Using the Addition/Subtraction Facts Table to Solve Subtraction Problems
- Generating Fact Families from Fact Triangles
- Playing Addition Top-It
- Math Boxes 6.5
- Options for Individualizing

6.6 – The Centimeter
- T513-517
- Getting Started
- Math Message Follow-Up
- Developing a Sense of a 10-Centimeter Length
- Measuring and Drawing Line Segments
- Playing the Tens-and-Ones Trading Game
- Math Boxes 6.6
- Options for Individualizing

6.7 – Exploring Pattern Blocks, Addition Facts, and Triangles
- T518-522
- Getting Started
- Math Message Follow-Up
- Explorations: A – Finding the Relationship among Pattern Blocks; B – Practicing Addition; C – Making Triangle Shapes on the Geoboard
- Playing Math Games
- Completing the Set of Fact Triangles
- Math Boxes 6.7
- Options for Individualizing

6.8 – Addition Facts Practice with “What’s My Rule?”
- T523-526
- Getting Started
- Math Message Follow-Up
- Reviewing the “What’s My Rule?” Routine
- Playing Dime-Nickel-Penny Grab

- Math Boxes 6.8
- Options for Individualizing

6.9 - Quarters

- T527-532
- Getting Started
- Math Message Follow-Up
- Introducing the Quarter
- Counting by 25s
- Counting combinations of Quarters, Dimes, Nickels, and Pennies
- Showing Money Amounts with Different Coin Combinations
- Counting Coins
- Objects that are 1 Centimeter and 10 Centimeters Long
- Math Boxes 6.9
- Options for Individualizing

6.10 – Digital Clocks

- T533-538
- Getting Started
- Math Message Follow-Up
- Counting the Minutes in an Hour
- Introducing the 5-minute Interval Marks on the Analog Clock
- Introducing the Digital Clock
- Using Digital Notation
- Playing Coin Exchange
- Math Boxes 6.10
- Options for Individualizing

6.11 – Timing in Seconds

- T539-543
- Getting Started
- Math Message Follow-Up
- Timing in Seconds
- Timing Me Activities
- Playing Beat the Calculator
- Math Boxes 6.11
- Options for Individualizing

6.12 – Data Landmarks

- T544-548
- Getting Started
- Math Message Follow-Up
- Timing a Calculator Count
- Making a Bar Graph
- Playing Addition Top-It
- Math Boxes 6.12
- Options for Individualizing

6.13 – Unit 6 Review and Assessment

- T549-553
- Math Message Follow Up

- Math Boxes 6.13
- Home Link 6.13 - Unit 7 Family Letter

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
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CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.4.A.15 - Explain how and why it is important that people from diverse cultures collaborate to find solutions to community, state, national, and global challenges
6.1.4.A.11 - Explain how the fundamental rights of the individual and the common good of the country depend upon all citizens exercising their civic responsibilities at the community, state, national, and global levels.

Suggested Assessments/ Benchmarks:
6.1 Math Message, Journal p109, Addition Top-It Game, Teacher Observation
6.2 Mental, Math Message, Teacher-Student Q&A, Journal p111
6.3 Math Message, Teacher Observation, Journal p113
6.4 Mental Math, Math Message, Journal p116, Beat the Calculator Game
6.5 Math Message, Journal p118, Teacher Observation
6.6 Math Message, Journal p120, Teacher Observation
6.7 Math Masters p179, 180, Teacher Observation
6.8 Math Message, Journal p124, Teacher Observation
6.9 Math Message, Teacher-Student Q&A, Teacher Observation, Journal p.126, Home Link
6.10 Journal p128,129, Teacher-Student Q&A, Home Link
6.11 Teacher Observation, Journal p131
6.12 Journal p134, Discussion, Teacher Observation
6.13 Slate, Oral, Self, and Written Assessments, Oral Response

Unit: 7 **Geometry and Attributes**	**Suggested Sequence:** **March**

NJSLS:

1.OA.B.3 Apply properties of operations as strategies to add and subtract.3 *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers* can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.) (Students need not use formal terms for these properties)

1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

1.G.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.

1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

***Essential Questions*:**	***Enduring Understandings:***
• How can spatial relationships be described by careful use of geometric language? • How do geometric relationships help to solve problems and/or make sense of phenomena? • How can attributes be used to classify data/objects?	• Geometric properties can be used to construct geometric figures. • Geometric relationships provide a means to make sense of a variety of phenomena. • Grouping by attributes (classification) can be used to answer mathematical problems.

Knowledge, Skills, and Instructional Objectives:

7.1 Reinforce sorting attribute blocks according to attribute rules
7.2 Reinforce sorting by attribute rules; to facilitate the learning of addition facts
7.3 Guide the identification of plane shapes; and to facilitate investigating some of their characteristics
7.4 Extend children's familiarity with polygons
7.5 Guide the identification of spheres, cylinders, and rectangular prisms; and to facilitate the investigation of their characteristics
7.6 Guide the identification of pyramids, cones, and cubes; and to facilitate the investigation of their characteristics
7.7 Facilitate the exploration of symmetrical shapes
7.8 Assess children's progress on mathematical content through the end of Unit 7

Recommended Instructional Activities/ Resources:

7.1 – Attribute Rules
- T 566-569
- Getting Started

- Math Message Follow Up
- Introducing the Attributes of Attribute Blocks
- Sorting Attribute Blocks by Attribute Rules
- Collecting Attribute Blocks According to Rules
- Counting Coin Combinations
- Math Boxes 7.1
- Options for Individualizing

7.2 – Exploring Attributes, Designs, and Fact Patterns

- T 570-573
- Getting Started
- Math Message Follow Up
- Playing Guess the Rule with Attribute Blocks
- Explorations: A – Playing the Attribute Train Game; B – Making Attribute-Block Designs, C – Using a Fact Platter Fact Generator
- Playing an Addition Fact Game
- Math Boxes 7.2
- Options for Individualizing

7.3 – Pattern-Block and Templates

- T 574-577
- Getting Started
- Math Message Follow Up
- Identifying Pattern-Block Shapes
- Measuring and Drawing Line Segments in Inches and Centimeters
- Math Boxes 7.3
- Options for Individualizing

7.4 – Making Polygons

- T 578-582
- Getting Started
- Math Message Follow Up
- Constructing Straw Polygons
- Discussing Similarities and Differences among Shapes
- Investigating Flipping Pennies
- Math Boxes 7.4
- Options for Individualizing

7.5 – Spheres, Cylinders, and Rectangular Prisms

- T 583-587
- Getting Started
- Math Message Follow Up
- Discussing the Characteristics of Spheres, Cylinders, and Rectangular Prisms
- Starting a Shapes Museum with a Display of 3-Dimensional Shapes
- Playing the Tens-and-Ones Trading Game
- Math Boxes 7.5
- Options for Individualizing

7.6 – Pyramids, cones, and Cubes

- T 588-592
- Getting Started

- Math Message Follow Up
- Discussing the Characteristics of Pyramids, Cones, and Cubes
- Reviewing the Six 3-Dimensional Shapes
- Identifying the Shapes of Various Objects
- Investigating Polygons with Geoboards
- Math Boxes 7.6
- Options for Individualizing

7.7 - Symmetry

- T 593-596
- Getting Started
- Math Message Follow Up
- Making Symmetrical Shapes
- Stand Up If…
- Math Boxes 7.7
- Options for Individualizing

7.8 – Unit 7 Review and Assessment

- T597-601
- Getting Started
- Math Message Follow-Up
- Math Boxes 7.8
- Home Link 7.8 Unit 8 Family Letter

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
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Career Ready Practices:
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CRP11. Use technology to enhance productivity.

6.1.4.A.15 - Explain how and why it is important that people from diverse cultures collaborate to find solutions to

community, state, national, and global challenges
6.1.4.A.11 - Explain how the fundamental rights of the individual and the common good of the country depend upon all citizens exercising their civic responsibilities at the community, state, national, and global levels.

Suggested Assessments/ Benchmarks:
7.1 Teacher-Student Q&A, Teacher Observation
7.2 Mental Math, Attribute Train Game, Math Masters p197,198,199
7.3 Journal p140,141, Teacher-Student Discussion and Q&A, Home Link
7.4 Polygon shape that each child creates, Journal p143, Teacher-Student Q&A, Home Link
7.5 Teacher-Student Q&A
7.6 Math Message, Teacher-Student Q&A, Journal 147, Teacher Observation
7.7 The symmetrical shapes that the children cut out, Teacher Observation, Teacher-Student Q&A, Home Link
7.8 Slate, Oral, Self, and Written Assessments, Oral Response

Unit: 8 **Mental Arithmetic, Money and Fractions**	**Suggested Sequence:** **April**

NJSLS:
1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1. OA.4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.*
1. OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).
1. OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).
1.OA.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.*
1. NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
1. NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:
1. NBT.2.a: 10 can be thought of as a bundle of ten ones — called a “ten.”

1.NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.
1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models (e.g., base ten blocks) or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
1.G.3 Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

Essential Questions:	***Enduring Understandings:***
• How do operations affect numbers? • What makes a computational strategy both effective and efficient? • How can we compare and contrast numbers?	• Numerical fluency includes both the understanding of and the ability to appropriately use numbers. • A quantity can be represented numerically in various ways. • Computational fluency includes understanding the meaning and the appropriate use of numerical operations. • The magnitude of numbers affects the outcome of the operations on them.

Knowledge, Skills, and Instructional Objectives:
8.1 Review, reinforce, and assess skills associated with counting and exchanging coins
8.2 Reinforce an understanding of money; to introduce dollars; and to facilitate the use of money to explore place value
8.3 Extend place-value concepts to hundreds
8.4 Provide practice solving number stories that involved addition and subtraction
8.5 Develop the use of counting up as a strategy for making change
8.6 Guide exploration of dividing regions into equal parts
8.7 Guide further understanding of fractional parts of a whole; and to introduce unit fraction notation
8.8 Introduce finding fractional parts of collections
8.9 Guide exploration of the relationship between multiples& fractions; to reinforce naming fractional parts of regions; to provide practice with add facts
8.10 Assess children's progress on mathematical content through the end of Unit 8

Recommended Instructional Activities/ Resources:
8.1 – Review: Money
- T614-617
- Getting Started
- Math Message Follow Up
- Review Counting Combinations of Coins
- Review Showing An Amount of Money
- Playing Coin Exchange
- Finding Values of Sets of Coins
- Identifying Geometric Shapes

- Math Boxes 8.1
- Options for Individualizing

8.2 - Dollars
- T618-623
- Getting Started
- Math Message Follow Up
- Examining a Dollar Bill
- The Purchasing Power of a Dollar
- Using Money Notation and Vocabulary
- Introducing One-Dollar Exchange
- Solving Broken Calculator Puzzles
- Comparing Money Amounts
- Math Boxes 8.2
- Options for Individualizing

8.3 – Place Value: Hundreds, Tens, and Ones
- T624-628
- Getting Started
- Math Message Follow Up
- Naming Numbers Shown with Base-10 Blocks
- Making Exchanges with Base-10 Blocks
- Writing Numbers for Collections of Base-10 Blocks
- Measuring and Drawing Line Segments
- Math Boxes 8.3
- Options for Individualizing

8.4 – Application: Shopping at the School Store
- T629-634
- Getting Started
- Math Message Follow Up
- Making Up and Solving Number Stories
- Recording Number Stories
- Playing Base-10 Exchange
- Math Boxes 8.4
- Options for Individualizing

8.5 – Making Change
- T635-638
- Getting Started
- Math Message Follow Up
- Paying for Items with Exact Amounts
- Making Change by Counting Up
- Role-Playing Shopping and Making Change
- Introducing the 3, 2, 1 Game
- Math Boxes 8.4
- Options for Individualizing

8.6 – Equal Shares
- T639-643
- Getting Started

- Math Message Follow Up
- Dividing Slates into Equal Parts
- Looking for Objects That Are Divided into Equal Parts
- Folding and Cutting Whole Crackers into Equal Parts
- Solving "What's My Rule?" Money Problems
- Math Boxes 8.6
- Options for Individualizing

8.7 - Fractions
- T644-648
- Getting Started
- Math Message Follow Up
- Introducing Fraction Notation
- Labeling Fractional Parts of Geometric Figures
- Playing One-Dollar Exchange
- Math Boxes 8.7
- Options for Individualizing

8.8 – Sharing Pennies
- T649-652
- Getting Started
- Math Message Follow Up
- Sharing 12 Pennies
- Practicing Sharing Pennies
- Playing Addition Top-It
- Math Boxes 8.8
- Options for Individualizing

8.9 – Exploring Fractional Parts and Addition Facts
- T653-656
- Getting Started
- Math Message Follow Up
- Explorations: A – Finding Relationships Involving Pattern Blocks, B – Naming Fractional Parts of Regions; C – Sorting Fact Triangles
- Playing Math Games
- Math Boxes 8.9
- Options for Individualizing

8.10 – Unit 8 Review and Assessment
- T657-661
- Getting Started
- Math Boxes 8.10
- Home Link 8.10 – Unit 9 Family Letter

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:
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CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.4.A.15 - Explain how and why it is important that people from diverse cultures collaborate to find solutions to community, state, national, and global challenges
6.1.4.A.11 - Explain how the fundamental rights of the individual and the common good of the country depend upon all citizens exercising their civic responsibilities at the community, state, national, and global levels.

Suggested Assessments/ Benchmarks:
8.1 Math Message, Slates, Coin Exchange Game, Journal p151
8.2 Teacher-Student Q&A, One-Dollar Exchange Game, Teacher Observation, Home Link
8.3 Math Message, Teacher Observation, Journal p156, Home Link
8.4 Math Message, Teacher Observation, Journal p160, Home Link
8.5 Math Message, Teacher-Student Q&A, Journal p163, Teacher Observation
8.6 Teacher-Student Q&A, Journal p165, Teacher Observation
8.7 Journal 165,168,169, Teacher Observation, Home Link
8.8 Math Message, Journal 171,172, Teacher Observation, Home Link
8.9 Math Masters p241,242,315,316 243, Teacher Observation, Geoboard
8.10 Slate, Oral, Self, and Written Assessments, Oral Response

Unit: 10 **Year-End Review and Assessment**	**Suggested Sequence:** **June**

NJSLS:

1. OA.4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.*
1. NBT.1 *Count* to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
1. NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:
1.NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.
1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models (e.g., base ten blocks) or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
1.NBT.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
1. MD.3 Tell and write time in hours and half-hours using analog and digital clocks.
1. MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Essential Questions:

- How can measurement be used to solve problems?
- How can the collection, organization, interpretation, and display of data be used to answer questions?
- How can attributes be used to classify data?
- How can spatial relationships be described by careful use of geometric language?
- How do geometric relationships help to solve problems and/or make sense of phenomena.
- How do operations affect numbers?
- What makes a computational strategy both effective and efficient?

Enduring Understandings:

- Everyday objects have a variety of attributes, each of which can be measured in many ways.
- What we measure affects how we measure it.
- Measurements can be used to describe, compare, and make sense of phenomena.
- The message conveyed by the data depends on how the data is collected, represented, and summarized.
- Grouping by attributes (classification) can be used to answer mathematical questions.
- Geometric properties can be used to construct geometric figures.
- Geometric relationships provide a means to make sense of a variety of phenomena.
- Computational fluency includes understanding the meaning and the appropriate use of numerical operations.
- The magnitude of numbers affects the outcome of the operations of them.

Knowledge, Skills, and Instructional Objectives:

10.1 Provide experiences with making a line plot and finding the typical values of a set of data
10.2 Review telling time on an analog clock and writing times in digital notation; to provide practice telling times in alternate ways; and to provide experiences with calculating elapsed times
10.3 Review showing amounts of money with coins and to provide experiences with solving number stories

involving addition of 2-digit numbers
10.4 Provide experiences with solving comparison number stories and calculating amounts of change from purchases
10.5 Review the names and some of the characteristics of polygons, as well as the names of basic 3D shapes
10.6 Review reading temperatures in degrees Fahrenheit; and to provide experiences using information on a map to find temperature differences
10.7 Review place value through hundreds
10.8 Assess children's progress on mathematical content through the end of Unit 10

Recommended Instructional Activities/ Resources:
10.1 – Data Day: End-of-Year Heights
- T726-729
- Getting Started
- Math Message Follow-Up
- Finding the Typical Height of Children in the Class
- Finding the Middle Value of the Height Data
- Finding Out How Much Children Grew
- Reviewing Measurement
- Math Boxes 10.1
- Options for Individualizing

10.2 – Telling Time
- T730-734
- Getting Started
- Math Message Follow-Up
- Reviewing Telling Time to Five Minutes
- Reviewing Digital Notation
- Practicing with Time at Five-Minute Intervals
- Telling Time to Minutes
- Playing Beat the Calculator
- Generating Fact Families
- Math Boxes 10.2
- Options for Individualizing

10.3 – Mental Arithmetic Using a Vending Machine Poster
- T735-739
- Getting Started
- Math Message Follow-Up
- Finding Coin Combinations to Use for Purchases
- Adding 2-Digit Vending Machine Prices
- Play Buyer and Vendor
- Solving Number Stories and Number-Grid Puzzles
- Math Boxes 10.3
- Options for Individualizing

10.4 – Mental Arithmetic (Continued)
- T740-743
- Getting Started
- Math Message Follow-Up

- Comparing Prices
- Making Change
- Making Change in Buyer and Vendor
- Solving Tic-Tac-Toe Addition Puzzles
- Math Boxes 10.4
- Options for Individualizing

10.5 – Year-End Geometry Review

- T744-748
- Getting Started
- Math Message Follow-Up
- Constructing Polygons out of Straws and Twist-Ties
- Reviewing the Names of 3-Dimensional Shapes
- Finding Combinations of Digits
- Playing a Favorite Math Game
- Math Boxes 10.5
- Options for Individualizing

10.6 – Review: Thermometers and Temperature

- T749-753
- Getting Started
- Math Message Follow-Up
- Reviewing Temperature and Thermometers
- Introducing Weather Maps
- Finding Differences Between High and Low Temperatures
- Practicing Addition and Subtraction Facts
- Math Boxes 10.6
- Options for Individualizing

10.7 – Review: Place Value, Scrolls, and Number Grids

- T754-759
- Getting Started
- Math Message Follow-Up
- Reviewing Place Value in 2-, 3-, and 4-Digit Numbers
- Extending Number-Grid Patterns
- Complete Math Journal 2
- Assess Children's Progress with Scrolls
- Playing Favorite Math Games
- Math Boxes 10.7
- Home Link 10.7 End Of Year Letter
- Options for Individualizing

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will

develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

6.1.4.A.15 - Explain how and why it is important that people from diverse cultures collaborate to find solutions to community, state, national, and global challenges
6.1.4.A.11 - Explain how the fundamental rights of the individual and the common good of the country depend upon all citizens exercising their civic responsibilities at the community, state, national, and global levels.

Suggested Assessments/ Benchmarks:
10.1 Journal p184, Teacher Observation, Discussion, Home Link
10.2 Math Message, Teacher-Student, Q&A, Journal p195, Teacher Observation
10.3 Teacher-Student Q&A, Journal p198, Teacher Observation, Home Link
10.4 Teacher-Student Q&A, Journal p197, Teacher Observation, Home Link
10.5 Math Message, Journal 202, 203, Math Masters p289
10.6 Teacher Observation, Math message, Journal p206, Teacher-Student Q&A
10.7 Teacher Observation, Slates, Building using base-10 blocks, Math Masters p335
10.8 Oral, Slate, Self, and Written Assessments, Oral Response

Second Grade

Unit: **1 Numbers and Routines**	**Suggested Sequence:** **September-Beginning of October**

NJSLS:

2.OA.2 Fluently add and subtract within 20 using mental strategies.2 By end of Grade 2, know from memory all sums of two one-digit numbers.

2.OA.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.

2.NB.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

2.NBT.1.a: 100 can be thought of as a bundle of ten tens — called a "hundred."

2.NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s.

2.NBT.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

2.NBT.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.

2.MD.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.

2.MD.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

2.MD.**8** Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*

Essential Questions:

- How do mathematical ideas interconnect and build on one another?
- How can we compare and contrast numbers?
- What are some various types of mathematical tools and how can they be used?
- How do operations affect numbers?
- What makes a computational strategy both effective and efficient?
- How can numbers be represented in a variety of ways?
- How can change be represented mathematically?
- How are patterns of change related to the behavior of functions?

Enduring Understandings:

- Numerical fluency includes both the understanding of and the ability to appropriately use numbers.
- One representation may sometimes be more helpful than another; and used together, multiple representations give a fuller understanding of a problem.
- A quantity can be represented numerically in various ways.
- The magnitude of numbers affects the outcome of the operations on them.
- Computational fluency includes understanding the meaning and the appropriate use of numerical operations.
- Algebraic and numeric procedures are interconnected and build on one another to produce a coherent whole.
- Algebraic representation can be used to generalize patterns and relationships.
- Patterns and relationships can be represented graphically, numerically, symbolically, or verbally.

Knowledge, Skills, and Instructional Objectives:

1.1 Introduce the Math Message routine, and review number sequences and number grids

1.2 Introduce the tool kits; and guide children as they find the values of coin combinations

1.3 Review months, weeks, and days; and review telling time

1.4 Provide practice with addition facts; and establish partnership principles
1.5 Provide review for grouping by tens; and provide practice for exchanging $1, $10, and $100 bills
1.6 Establish rules for working in small groups; and review number patterns and sequences
1.7 Guide children as they explore place-value patterns on number grids
1.8 Provide experiences with giving equivalent names for numbers; and review calculator use
1.9 Guide children as they count and look for patterns on the calculator
1.10 Provide experiences with comparing numbers using the relation symbols <,>, = ; and introduce Home Links
1.11 Guide children as they read and display temperatures; combine values of ones, tens, and hundreds using base-10 blocks; and explore addition facts on dominoes
1.12 Assess children's progress on mathematical content through the end of Unit 1

Recommended Instructional Activities/Resources:

1.1 Math Message and Number Sequence
- T16- 20
- Getting started
- Math message follow-up
- Writing numbers in sequence
- Reviewing number sequences starting with 1,000
- Introducing the journal
- Missing numbers on number lines
- Sharing ideas about mathematics
- Options for individualizing

1.2 Tool Kits
- T22- 25
- Getting started
- Math message follow-up
- Distributing tool kits
- Finding the values of coin combinations
- More oral coin-counting
- Exploring the pattern-block template
- Options for individualizing

1.3 Calendars and Clocks
- T26-29
- Getting started
- Math message follow-up
- Building a calendar for the month
- Telling time
- Completing calendar pages
- Options for individualizing-*Saying and Writing Ordinal Numbers*

1.4 Partner Study Routines
- T31-35
- Getting started
- Math message follow-up
- Discussing partnership principles
- Exploring the everything math deck
- Demonstrating and playing *Addition Top-It*
- Exploring number-grid patterns
- Completing a number grid
- Options for individualizing- *Playing Coin Top- It*

1.5 Slate Rountines
- T36-39
- Getting started
- Math message follow-up
- Introducing the slate routine
- Making tally marks for 30 seconds
- Representing numbers with tally marks
- Playing *Addition Top-It*
- Options for individualizing-*Dice Roll and Tally Game*

1.6 Grouping by Tens- $1, $10, and $100 bills
- T40-43
- Getting started
- Math message follow-up
- Counting money
- Playing the *Money Exchange Game* with $100 bills
- Playing *Addition Top-It*
- Options for individualizing-*Money Exchange Game*

1.7 Math Boxes
- T44-47
- Getting started
- Math message follow-up
- Introduce math boxes
- Completing a math boxes page
- Playing *Penny Cup*
- Math boxes 1.7
- Options for individualizing-*Two Fisted Penny Addition*

1.8 Working in Small Groups
- T48-51
- Getting started
- Math message follow-up
- Exploring counting patterns on the class number grid poster
- Establishing rules for small-group work
- Making a class number scroll from 1 to 1,000
- Playing *Addition Top-It*
- Math boxes 1.8
- Options for individualizing-*Minute Math*

1.9 Number Grids
- T52-55
- Getting started
- Math message follow-up
- Finding patterns on a number grid
- Completing number-grid puzzles
- Going on a number-grid hunt
- Math boxes 1.9
- Options for individualizing-*Filling in pieces of a number grid*

1.10 Equivalent Names for Numbers
- T56-60
- Getting started

- Math message follow-up
- Reviewing equivalent names for numbers
- Reviewing calculator use
- Skip counting on the calculator
- Solving broken calculator problems
- Playing the *Money Exchange Game*
- Math boxes 1.10
- Options for individualizing-*Counting patterns on a number grid*

1.11 Counting Patterns
- T61-63
- Getting started
- Math message follow-up
- Counting on a calculator
- Solving broken calculator problems
- Math boxes 1.11
- Options for individualizing-*Pin the Number on the Number Grid*

1.12 Relations (<, >, =) and Home Links
- T65-69
- Getting started
- Math message follow-up
- Reviewing relations: less than, greater than, equal to
- Practicing the use of symbols <, >, =
- Playing *Addition Top-It*
- Math boxes 1.12
- Options for individualizing-*Digit Discovery*

1.13 Exploring Temperatures, Base-10 Structures, and Dominoes
- T71-74
- Getting started
- Math message follow-up
- Discussing procedures and expectations for explorations
- Exploration A: measuring temperature
- Exploration B: calculating the values of base-10 structures
- Exploration C: sorting dominoes
- Playing *Addition Top-It*
- Math boxes 1.13
- Options for individualizing-*Minute Math*

1.14 Unit 1 Review and Assessment
- Getting started T76
- Math message follow-up
- Math boxes 1.1

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize

information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments/Benchmarks:
1.1 Journal p1, Number-Line Squeeze Game, Teacher observation
1.2 Journal p2, Teacher observation, slates
1.3 Journal p3,4
1.4 Journal p5,Addition Top-It Game, Math Master p449,Exit Slip
1.5 Journal p6, Money Exchange Game
1.6 Journal p7, Penny Plate Game, Math Master 468
1.7 Teacher observation
1.8 Journal p9-10, Number- Grid Game
1.9 Journal p11-12, Teacher observation
1.10 Journal p14-15, Teacher observation
1.11 Slates, Teacher observation
1.12 Teacher observation and discussion
1.13 Oral, Slate, Written, Self, Open Response Assessments

Unit: 2 **Addition and Subtraction Facts**	**Suggested Sequence:** **October**

NJSLS:

2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

2.OA.2 Fluently add and subtract within 20 using mental strategies.2 By end of Grade 2, know from memory all sums of two one-digit numbers.

2.NBT.8 Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.

2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.

2.MD.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.

Essential Questions:	***Enduring Understandings:***
• How do operations affect numbers? • How can we use math information to choose an operation? • What makes a computational strategy both effective and efficient? • How can change be represented mathematically? • How can students use modeling to identify math processes? • What is the best solution to solve problems?	• *Computational fluency includes understanding the meaning and the appropriate use of numerical operations.* • *The magnitude of numbers affects the outcome of the operations on them.* • *One representation may sometimes be more helpful than another; and used together, multiple representations give a fuller understanding of the problem.* • *Students will be able to explain their mathematical thinking by using critical thinking skills and making connections with mathematical relationships.* • *Different math approaches can yield the same results.*

Big Ideas:

Numeric reasoning involved fluency and facility with numbers.

Algebra provides language through which we communicate the pattern in mathematics.

Knowledge, Skills, and Instructional Objectives:

2.1 Guide children as they make up, represent, and solve addition number stories

2.2 Review +0 and +1 addition facts; and to provide practice with addition facts in which one of the addends is 0, 1, 2, or 3

2.3 Review and provide practice for doubles facts

2.4 Review the turn-around shortcut for addition; and discover and provide practice for a shortcut for addition facts that have 9 as an addend
2.5 Provide opportunities for children to explore and practice doubles-plus-1 and doubles-plus-2 facts
2.6 Review the -0 and -1 shortcuts; and to guide children to identify the subtraction facts related to given addition facts
2.7 Demonstrate the inverse relationship between addition and subtraction; and provide practice for addition and subtraction facts for sums up to and including 10
2.8 Guide children as they use a pan balance and spring scale, experience the ounce/pound relationship, and find the total number of objects in equal groups
2.9 Review the concept that a number can be named in many ways
2.10 Guide children as they use a given addition or subtraction rule to generate a number sequence, and as they identify the rule for a given sequence
2.11 Provide experiences with identifying missing numbers in number pairs that are generated by a rule, and determining the rule used to generate number pairs
2.12 Review, develop, and provide practice for subtraction strategies
2.13 Guide children as they discover and practice shortcuts for subtracting 9 or 8 from any number
2.14 Assess children's progress on mathematical content through the end of Unit 2

Recommended Instructional Activities/Resources:

2.1 Addition Number Stories

- T 92-95
- Getting started
- Math message follow-up
- Making up and solving addition number stories
- Writing addition number stories
- Completing number-grid puzzles
- Math Boxes 2.1

- Options for individualizing

2.2 Review "Easy" Addition Facts

- T96-99
- Getting started
- Math message follow-up
- Reviewing +0 and +1 shortcuts
- Demonstrating *Beat the Calculator*
- Playing *Beat the Calculator*
- Stressing the importance of "Fact Power"
- Finding distances on a number grid
- Math boxes 2.2

- Options for individualizing

2.3 Double Facts

- T101-104
- Getting started
- Math message follow-up
- Reviewing the meaning of "sum"
- Reviewing the fact table
- Reviewing the doubles facts
- Practicing doubles facts and "Almost Doubles" facts
- Play *Beat the Calculator*
- Math Boxes 2.3

- Options for individualizing

2.4 Turn-Around Facts and the +9 Shortcut

- T106-108
- Getting started
- Math message follow-up
- Introducing the +9 shortcut
- Practicing +9 facts
- Practicing double facts
- Math boxes 2.4

- Options for individualizing

2.5 Addition Strategies That Uses Doubles Facts

- T110-113
- Getting started
- Math message follow-up
- Discussing doubles-plus-1 facts
- Discussing doubles-plus-2 facts
- Practicing addition strategies that use doubles facts
- Playing a *Dominoes version of Addition Top-It*
- Cutting out fact triangles
- Math Boxes 2.5

- Options for individualizing

2.6 Subtraction from Addition

- T114-117
- Getting started
- Math message follow-up
- Discussing the –0 and the –1 shortcuts
- Using dominoes to generate related addition and subtraction facts
- Practicing domino facts
- Practice addition facts by playing *Beat the Calculator* or *Addition Top-It*
- Math Boxes 2.6
- Options for individualizing

2.8 Exploring Weights, Scales, Equal Groups

- T119-122
- Getting started
- Math message follow-up
- Demonstrating the pan balance
- Demonstrating the spring scale
- Exploration A: using a pan balance
- Exploration B: using a spring scale
- Exploration C: making equal groups of objects
- Math boxes 2.7
- Playing *Beat the Calculator*

2.8 Fact Families

- T124-127
- Getting started
- Math message follow-up

- Discussing fact families
- Demonstrating the use of +, - fact triangles
- Practicing with fact triangles
- Solving pan-balance problems
- Math boxes 2.8
- Options for Individualizing-*Fact triangles*

2.9 Name Collections

- T129-132
- Getting started
- Math message follow-up
- Demonstrating *Name That Number*
- Playing *Name That Number*
- Practicing the Name -Collection Boxes
- Solving Subtraction Number Stories
- Math Boxes 2.9
- Options for Individualizing-*Name Collection Boxes*

2.10 Frames and Arrows Routines

- T133-137
- Getting Started
- Math message Follow-up
- Demonstrating Frames-and-Arrows routines
- Completing Frames-and-Arrows
- Playing *Name That Number*
- Math Boxes 2.10
- Options for Individualizing-*Counting on a Number Grid, Frames and Arrows*

2.11 "What's My Rule?" Rountines

- T138-142
- Getting started
- Math message follow-up
- Establishing "What's My Rule" routines
- Using function machines to illustrate "What's My Rule?" tables
- Solving "What's My Rule?" problems
- Practicing with +, - fact triangles
- Math Boxes 2.11
- Options for individualizing-*"What's My Rule?"*

2.12 Counting Strategies for Subtraction

- T143-146
- Getting started
- Math message follow-up
- Reviewing the meaning of "difference"
- Reviewing the counting-back strategy for subtraction
- Reviewing the counting-up strategy for subtraction
- Practicing with +, - fact triangles
- Playing *Beat the Calculator*
- Cutting out +, - fact triangles
- Math Boxes 2.12
- Options for Individualizing-*Minute Math*

2.13 Shortcuts for "Harder" Subtraction Facts

- T148-151
- Getting started
- Math message follow-up
- Introducing a –9 shortcut
- Introducing a –8 shortcut
- Practicing –9 and –8 shortcuts
- Practicing with +, - fact triangles
- Math Boxes 2.13

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments/Benchmarks:
2.1 Journal p21,22,23, Teacher observation
2.2 Math Journal p24, Beat the Calculator Game, Exit Slip
2.3 Journal p29, Math Masters p27, Slates
2.4 Journal p31, Slates, Teacher observation, Home Link 2-1
2.5 Journal p33, Teacher observation and discussion
2.6 Journal p35, discussion, Exit Slip
2.7 Journal p37, Fact Triangles, Slates, Home Link 2-7

2.8 Journal p39, Teacher observation and discussion 2.9 Journal p41, Math Master p 462, Name That Number Game 2.10 Journal p43,45, Name That Number Game, Teacher Observation 2.11 Journal p47,48, Teacher Observation, Math Masterp426 2.12 Teacher observation, Home Links 2-12 2.13 Journal p50, Teacher observation 2.14 Oral, Slate, Written, Self, Open Response Assessments

Unit: 3 **Place Value, Money, and Time**	**Suggested Sequence:** **November**

NJSLS:

2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

2.NB.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

2.NBT.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

2.MD.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.

2.MD.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

2.MD.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*

2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.5 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

Essential Questions:	***Enduring Understandings:***
• How does the position of a digit in a number affect its value? • How can we compare and contrast numbers using place value? • When should you estimate amounts of money? • How can I represent the same amount of money using different combinations of coins and bills? • How can I represent various amount of money using decimal notation and the symbols for cents or dollars? • How many different ways can I make a specific amount of money using various denominations of coins and bills? • How can I create efficient ways for combining coins and making change?	• Numerical fluency includes both the understanding of and the ability to appropriately use numbers. • Place value is based on groups of ten. • Context is critical when using estimation. • One representation may sometimes be more helpful than another; and used together, multiple representations give a fuller understanding of the problem.

Knowledge, Skills, and Instructional Objectives:

3.1 Review place value in 2-digit and 3-digit numbers
3.2 Review coin values and exchanges among coins; and provide experiences with finding coin combinations needed to pay for items
3.3 Review telling time; and provide experiences with writing time in digital-clock notation
3.4 Provide experiences with representing and renaming numbers with base-10 blocks; reviewing time; and making, describing, and comparing geoboard shapes
3.5 Provide experiences with gathering data, entering data in a table, and drawing a bar graph; and demonstrate a strategy for finding the middle value in a data set
3.6 Guide children s they solve Frames-and-Arrows problems having two rules
3.7 Guide children as they make change by counting up from the cost of an item to the amount tendered
3.8 Guide children as they solve multistep problems for amounts under $1.00; and as they practice making change using nickels, dimes, and quarters
3.9 Assess children's progress on mathematical content through the end of Unit 3

Recommended Instructional Activities/Resources:

3.1 Numeration and Place Value

- T169-172
- Getting started
- Math message follow-up
- Exploring a simple way to draw base-10 blocks
- Matching numbers and displays of base-10 blocks
- Saying, writing, displaying, and describing numbers
- Doing place-value exercises
- Completing Magic Squares
- Math Boxes 3.1
- Options for individualizing

3.2 Using Coins to Buy Things
- T174-177
- Getting started
- Math message follow-up
- Reviewing the exchanges for coins and $1 bills
- Paying for things with coins
- Taking turns buying and selling
- Playing the *Digit Game*
- Math boxes 3.2
- Options for individualizing-*Making Different Coin Combinations for the Same Value*

3.3 Telling Time
- T178-182
- Getting started
- Math message follow-up
- Discussing the functions of clock hands
- Estimating time with an hour hand only
- Estimating time with the hour hand and the minute hand
- Telling and writing time
- Solving frames-and-arrows problems
- Math boxes 3.3
- Options for individualizing

3.4 Exploring Numbers, Time and Geoboards
- T183-187
- Getting started
- Math message follow-up
- Exploration A: building and renaming numbers
- Exploration B: making a clock booklet
- Exploration c: making and comparing shapes on a geoboard
- Practicing complements of 100 by playing *Dollar Rummy*
- Math boxes 3.4
- Options for individualizing-*Minute Math*

3.5 Data Day: Pockets
- T188-192
- Getting started
- Math message follow-up
- Finding the middle number of pockets
- Tallying the pocket data
- Making a bar graph of the pocket data
- Practicing with +, - fact triangles
- Math boxes 3.5
- Options for individualizing-*Comparing Pocket Data*

3.6 Frames and Arrows Having Two Rules
- T193-197
- Getting started
- Math message follow-up
- Frames-and-arrows diagrams having two rules
- Solving frames-and-arrows problems
- Reading a bar graph

- Math boxes 3.6
- Options for individualizing-*Frames and Arrows with two rules*

3.7 Making Change by Counting Up

- T198-201
- Getting started
- Math message follow-up
- Demonstrating how to make change by counting up
- Acting as customer or clerk
- Solving frames-and-arrows having 2 rules
- Math boxes 3.7
- Options for individualizing-*Spinning for Money game*

3.8 Coin Exchanges

- T202-206
- Getting started
- Math message follow-up
- Buying items with exact change only
- Buying items without exact change
- Making a vending-machine purchase
- Playing *Making Change*
- Math boxes 3.8
- Options for individualizing

3.9 Unit 3 Review and Assessment

- Math message follow-up
- Math boxes 3.9
- Assessment Unit 3- Check in Progress

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:

Technology:

8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.

8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments/Benchmarks:
3.1 Journal p53, The Digit Game
3.2 Journal p57, Spinning for Money Game, Home-Link 3-2
3.3 Journal p59, Teacher observation
3.4 Journal p61, Math Masters p 65-69, Teacher Observation
3.5 Journal p67, Teacher Observation, Dollar Rummy Game, Home-Link 3-5
3.6 Journal p 69,70,71 Math Master p441
3.7 Journal p73, Digit Game, Exit Slip
3.8 Journal p75,Teacher observation
3.9 Oral, Slate, Written, Self, Open Response Assessments

Unit: 4 **Addition and Subtraction**	**Suggested Sequence:** **November-Beginning of December**

NJSLS:
2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions,

e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
2.NB.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
2.NBT.1.a: 100 can be thought of as a bundle of ten tens — called a "hundred."
2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.
1.NBT.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
2.NBT.8 Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900
2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.
2.MD.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2.MD.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
2.MD.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*
2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.5 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
2.G.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

Essential Questions:

- How do operations affect numbers?
- How can we use math information to choose an operation?
- What makes a computational strategy both effective and efficient?
- How can we decide when to use an exact answer and when to use an estimate?
- How can technology help solve problems?
- How do patterns help solve problems?
- How can students use modeling to identify math processes?
- What is the best solution to solve problems?

Enduring Understandings:

- Computational fluency includes understanding the meaning and the appropriate use of numerical operations.
- The magnitude of numbers affects the outcome of the operations on them.
- One representation may sometimes be more helpful than another; and used together, multiple representations give a fuller understanding of the problem.
- Students will be able to explain their mathematical thinking by using critical thinking skills and making connections with mathematical relationships.
- Math processes can give students the "tools" needed to help them become problem-solvers.
- Different math approaches can yield the same results

Knowledge, Skills, and Instructional Objectives:

4.1 Guide children as they solve change-to-more number stories
4.2 Guide children as they solve parts-and-total number stories
4.3 Guide children as they explore reading temperatures on a thermometer, practice finding the total value of a group of coins, and develop readiness for classifying geometric shapes
4.4 Guide children as they read and show temperatures and solve number stories about temperature changes

4.5 Guide children as they use estimation to solve problems for which an exact answer is not necessary
4.6 Guide children as they develop strategies for adding 2-digit numbers mentally; provide experiences with calculating the total cost of two items; and demonstrate making change for whole-dollar amounts up to $100
4.7 Guide children as they measure lengths and distances to the nearest inch and centimeter, explore area by tiling surfaces and sort attribute blocks according to rules
4.8 Guide children as they develop paper-and-pencil strategies for adding 2- and 3-digit numbers; and demonstrate using estimation to check if answers are reasonable
4.9 Introduce and practice the partial-sums addition algorithm
4.10 Assess children's progress on mathematical content through the end of Unit 4

Recommended Instructional Activities/Resources:

4.1 Change-to-More Number Stories
- T224-229
- Getting started
- Math message follow-up
- Introducing the Change Diagram
- Solving Change-to-More Number Stories
- Finding Distances on a Number Line
- Math boxes 4.1
- Options for individualizing-*Finding Distances on a Number Grid*

4.2 Parts-and-Total Number Stories
- T230-234
- Getting started
- Math message follow-up
- Finding the cost of two or more items
- Playing *Addition Spin*
- Math Boxes 4.2
- Options for individualizing-*Two-Fisted Penny Addition*

4.3 Exploring Temperature, Money, and Shapes
- T235-240
- Getting started
- Math message follow-up
- Translating between Fahrenheit and Celsius temperatures
- Exploration A: measuring temperature
- Exploration B: Making Coin-Stamp booklets
- Exploration C: Sorting Attribute Blocks
- Playing *Addition Spin*
- Math box 4.3
- Options for individualizing-*Minute Math*

4.4 Temperature Changes
- T241-246
- Getting started
- Math message follow-up
- Solving "How much warmer (colder)?" problems
- Reading and showing temperatures and solving temperature-change problems
- Solving Parts-and-Total Number Stories
- Math box 4.4
- Options for individualizing-*Change to more or less*

4.5 Estimating Costs

- T247-251
- Getting started
- Math message follow-up
- Discussing estimation
- Solving problems by estimation
- Comparing quantities using >, <, or =
- Math box 4.5
- Options for individualizing-*Using Estimation to Compare Sums of Weights*

4.6 A Shopping Activity

- T252-256
- Getting started
- Math message follow-up
- Strategies for adding 2-digit numbers
- Playing *Shopping*
- Solve shopping problems
- Playing *Addition Spin*
- Math box 4.6
- Options for individualizing-*Adding Multiples of 10*

4.7 Exploring Length, Area, and Attributes

- T 257-262
- Getting started
- Math message follow-up
- Examining inch and centimeter scales
- Exploration D: Measuring lengths with a tape measure
- Exploration E: Tiling Surfaces with different shapes
- Exploration F: Sorting Attribute blocks
- Playing *Shopping*
- Math box 4.7
- Options for individualizing-*Inches and Centimeters*

4.8 Paper-and-Pencil Addition Strategies

- T263-268
- Getting started
- Math message follow-up
- Discussing the use of ballpark estimates to check answers
- Solving addition problems: Keeping a paper-and-pencil record
- Finding the sum of two multidigit numbers
- Solving "What's My Rule?" and frames-and-arrows problems
- Math box 4.8
- Options for individualizing-*Place Value Concepts*

4.9 The Partial-Sums Addition Algorithm

- T269 – 274
- Getting started
- Math message follow-up
- Introducing the partial-sums addition algorithm using base-10 blocks
- Introducing the partial-sums algorithm as a paper-and-pencil method
- Practicing the partial-sums algorithm
- Review telling time
- Math box 4.9

- Options for individualizing-*Exploring Pattern Block Designs*

4.10 Unit 4 Review and Assessment

- Math message follow-up
- Math box 4.10

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:

Technology:

8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.

8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments/Benchmarks:

4.1 Journal p81, Teacher Observation
4.2 Journal p85, Addition Spin Game
4.3 Teacher observation, Exit slip
4.4 Journal p90, Teacher observation
4.5 Journal p93, Teacher observation, Name That Number Game
4.6 Math Boxes, Problem 4, Discussion and Teacher observation
4.7 Teacher observation, Exit Slip
4.8 Slates, Journal p105, Fact Extension Game , Teacher observation
4.10 Oral, Slate, Written, Self, Open Response Assessments

Unit: 5 **3-D and 2-D Shapes**	**Suggested Sequence:** **Mid December- Beginning of January**

NJSLS:

2.OA.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

2.NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s.

2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.

1.NBT.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

2.MD.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.5 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

Essential Questions:

- How can geometry relate to real world connections?
- Why is geometry important?
- How can spatial relationships be described by careful use of geometric language?
- How do geometric relationships help solve problems and/or make sense of phenomena?
- How can attributes be used to classify data/objects?
- Where would you find symmetry?
- How can objects be represented and compared using geometric attributes?
- How can solid figures be identified and described by the faces, edges, and sides?
- What is the difference between a point, ray, line, line segment?

Enduring Understandings:

- Geometric properties can be used to construct geometric figures.
- Geometric relationships provide a means to make sense of phenomena.
- Grouping by attributes (classification) can be used to answer mathematical questions.
- Geometry and spatial sense offer ways to interpret and reflect on our physical environment.
- Analyzing geometric relationships develops reasoning and justification skills.
- Points, lines, and planes are the foundation of geometry.

Knowledge, Skills, and Instructional Objectives:

5.1 Demonstrate rules used to classify shapes; develop readiness for division; and demonstrate telling time using digital and analog notation

5.2 Guide children as they define, name, and draw line segments

5.3 Introduce the concepts of parallel and parallel line segments

5.4 Review names and classify polygons; develop readiness for multiplication; and provide opportunities to explore similarities and differences of attribute blocks

5.5 Guide children as they identify the names ad the characteristics of various quadrangles, and as they explore similarities and differences among quadrangles

5.6 Guide children as they compare ad contrast the characteristics of 3-dimensional shapes

5.7 Guide children as they construct pyramids and explore the relationship among the number of faces, edges, and vertices in pyramids

5.8 Guide children as they find lines of symmetry in objects and complete drawings to create symmetrical shapes

5.9 Assess children's progress on mathematical content through the end of Unit 5

Recommended Instructional Activities/Resources:

5.1 Exploring Rules, Directions, and Time

- T 290-294
- Getting started
- Math message follow-up
- Exploration A: Figuring out attribute tiles
- Exploration B: Giving and following directions to make figures on a geoboard
- Exploration C: making and playing *clock concentration*
- Playing *Addition Spin*
- Options for individualizing

5.2 Exploring Attributes, Triangle, and Sharing

- T 295-299
- Getting Started
- Math message follow-up
- Exploration D: finding attribute blocks that differ by one attribute or more
- Exploration E: Investigating shapes of triangles
- Exploration F: exploring equal sharing
- Playing *Shopping*
- Math boxes 5.2
- Options for individualizing

5.3 Exploring Polygons, Arrays, and Coins

- T 300-304
- Getting Started
- Math message follow-up
- Reviewing characteristics of polygons
- Naming polygons by the number of their sides or angles
- Exploration G: constructing polygons on a geoboard
- Exploration H: Making Centimeter-cube arrays
- Exploration I: Making a dollar
- Playing *Dollar Rummy*
- Math boxes 5.3
- Options for individualizing

5.4 Points and Line Segments

- T305-309
- Getting started
- Math message follow-up
- Discussing how points are named
- Defining and naming line segments
- Drawing line segments with a straightedge
- Playing *Clock Concentration*
- Math boxes 5.4
- Options for individualizing

5.5 Parallel Line Segments

- T 310-313
- Getting started
- Math message follow-up
- Discussing the meaning of parallel line segments
- Drawing line segments that are or are not parallel

- Math boxes 5.5
- Options for individualizing

5.6 Quadrangles

- T 314-318
- Getting started
- Math message follow-up
- Exploring similarities and differences among quadrilaterals
- Making shapes out of triangles and rectangles
- Math boxes 5.6
- Options for individualizing

5.7 3-Dimensional Shapes

- T 319-324
- Getting started
- Math message follow-up
- Reviewing the names of the basic 3-dimensional shapes
- Discussing similarities and differences among shapes
- Starting a shape museum
- Identifying the shapes of real objects
- Drawing and counting line segments
- Math boxes 5.7
- Options for individualizing

5.8 Pyramids

- T 325-331
- Getting started
- Math message follow-up
- Constructing a pyramid out of straws
- Constructing four kinds of pyramids out of straws
- Discussing pyramid constructions
- Math boxes 5.8
- Options for individualizing

5.9 Line of Symmetry

- T 332-336
- Getting started
- Math message follow-up
- Finding lines of symmetry
- Completing half-pictures of template shapes
- Math boxes 5.9
- Options for individualizing

5.10 Unit 5 Review and Assessment

- T 337-341
- Getting started
- Math message follow-up
- Math boxes 5.10
- Check in progress in Unit 5

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:

Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments/Benchmarks:
5.1 Teacher observation, Exit Slip
5.2 Journal p 113, Teacher observation, Exit Slip
5.3 Journal p115-117, Home Link 5-3
5.4 Math Master p137, Teacher observation
5.5 Journal p115, Class discussion and Teacher observation
5.6 Slates, Journal p125, Math Boxes Problem 5, Teacher observation
5.7 Math Boxes, Problem 2, Teacher observation
5.8 Slates, Journal p128, Fact Extension Game
5.9 Oral, Slate, Written, Self, Open Response Assessments

Unit: 6 **Whole -Number Operations and Number Stories**	**Suggested Sequence:** **January- Beginning of February**

NJSLS:

2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

2.OA.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.

1.NBT.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

2.NBT.8 Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900

2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.

2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

2.MD.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.

2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

Essential Questions:	***Enduring Understandings:***
• How do operations affect numbers? • How can we use math information to choose an operation? • What makes a computational strategy both effective and efficient? • How can we decide when to use an exact answer and	• Computational fluency includes understanding the meaning and the appropriate use of numerical operations. • The magnitude of numbers affects the outcome of the operations on them. • One representation may sometimes be more helpful than

when to use an estimate? • How can technology help solve problems? • How do patterns help solve problems? • How can students use modeling to identify math processes? • What is the best solution to solve problems? • How do I decide what strategy will work best in a given problem situation? • What are the mathematical properties that govern addition and multiplication? How would you use them? • How can multiples be used to solve problems? • What strategies aid in mastering multiplication and division facts? • How can I use the array model to explain multiplication? • How can I relate what I know about skip counting to help me learn the multiples of 2,5,10? • How are repeated addition and multiplication related? • How can I use what I know about repeated subtraction, equal sharing, and forming equal groups to solve division problems? • How does my knowledge about multiplication facts help me to solve problems? • How do I know when a result is reasonable? • What is the relationship between solving problems and computation?	another; and used together, multiple representations give a fuller understanding of the problem. • Students will be able to explain their mathematical thinking by using critical thinking skills and making connections with mathematical relationships. • Math processes can give students the "tools" needed to help them become problem-solvers. • Different math approaches can yield the same results. • Operations create relationships between numbers. • The relationships among the operations and their properties promote computational fluency. • There can be different strategies to solve a problem, but some are more effective and efficient than others. • The context of a problem determines the reasonableness of a solution.

Knowledge, Skills, and Instructional Objectives:

6.1 Review strategies for solving addition problems, with emphasis on problems having three addends
6.2 Introduce comparison number stories by using comparison diagrams
6.3 Provide experiences with collecting, sorting, tallying, and graphing data
6.4 Guide children in selecting and completing an appropriate diagram to help solve an addition or subtraction problem
6.5 Review solution strategies for subtraction of 2-digit numbers
6.6 Develop readiness for multiplication; guide children in finding coin combinations equivalent to $1.00, and to explore one meaning of division
6.7 Introduce multiplication as a way to find the total number of things in several equal groups
6.8 Introduce everyday examples of rectangular arrays; and provide experiences with solving multiplication problems using multiplication diagrams and array models
6.9 Introduce everyday examples of arrays; and provide experiences with solving multiplication problems using multiplication diagrams and array models
6.10 Guide children as they explore situations that require equal sharing or making equal groups of things
6.11 Assess children's progress on mathematical content through the end of Unit 6

Recommended Instructional Activities/Resources:

6.1 Addition with Several Addends

- T354-359
- Getting started
- Math message follow-up

- Adding three numbers in any order
- Playing *Three Addends*
- Practicing estimation and the partial-sums algorithm
- Math boxes 6.1
- Options for individualizing-*Three Addends-Multiples of 10*

6.2 Comparison Number Stories

- T360-365
- Getting started
- Math message follow-up
- Solving comparison number stories
- Solving comparison number stories
- Playing *Addition Top-It*
- Math boxes 6.2
- Options for individualizing-*Penny Grab*

6.3 Data Day: The Four Food Groups

- T366-371
- Getting started
- Math message follow-up
- Collecting data on favorite foods
- Discussing the favorite-food data table
- Making a bar graph of the favorite-food data
- Comparing lengths of fish on the fist poster
- Math boxes 6.3
- Options for individualizing-*Graphing Data*

6.4 Mixed Addition and Subtraction Stories

- T 372-376
- Getting started
- Math message follow-up
- Selecting diagrams and solving number stories
- Reviewing estimation and the partial-sum algorithm
- Math boxes 6.4
- Options for individualizing-*Number Stories*

6.5 Modeling Subtraction with Base-10 Blocks

- T 377-383

Day 1

- Getting started
- Math message follow-up
- Using base-10 blocks to model subtraction that does not require trades
- Solving subtraction problems that do not require trades

Day 2

- Using base-10 blocks to model subtraction that require trades
- Solving subtraction problems that require trades
- Solving addition and subtraction diagram problems
- Math boxes 6.5
- Options for individualizing
- T384-389
- Getting started

- Math message follow-up
- Demonstrating the trade-first algorithm without trades
- Demonstrating the trade-first algorithm with trades
- Practicing the trade-first algorithm
- Practicing with addition/ subtraction fact triangles
- Math boxes 6.6
- Options for individualizing-*Subtracting with Coins*

6.6 The Trade-First Subtraction Algorithm

- T384-389
- Getting started
- Math message follow-up
- Demonstrating the trade-first algorithm without trades
- Demonstrating the trade-first algorithm with trades
- Practicing the trade-first algorithm
- Practicing with addition/ subtraction fact triangles
- Math boxes 6.6
- Options for individualizing-*Subtraction Number Stories*

6.7 Exploring Arrays, Symmetry, and Division

- T390-394
- Getting started
- Math message follow-up
- Exploration A: Making Geoboard Arrays
- Exploration B: Creating Pattern-Block Symmetry
- Exploration C: Finding How Many Children Get n things
- Playing *Three Addends*
- Math Boxes 6.7
- Options for individualizing-*Minute Math*

6.8 Multiples of Equal Groups

- T395-399
- Getting started
- Math message follow-up
- Solving Number Stories about Equal Groups of Things
- Solving Number Stories about Equal Groups
- Practicing with Addition/Subtraction fact triangles
- Math Boxes 6.8
- Options for individualizing-*Minute Math*

6.9 Multiplication-Array Number Stories

- T400-404
- Getting started
- Math message follow-up
- Identifying familiar arrays
- Creating and solving number stories about arrays
- Solving array multiplication problems
- Creating and solving number stories about equal groups
- Math Boxes 6.9
- Options for individualizing

6.10 Multiplication with Arrays

- T405-409

- Getting started
- Math message follow-up
- Making x-by-y arrays
- Introducing Array Bingo
- Playing *Array Bingo*
- Using estimation and the Trade-First subtraction algorithm
- Math Boxes 6.10
- Options for individualizing-*Array Bingo*

6.11 Division Stories

- T 410-415
- Getting started
- Math message follow-up
- Model equal-sharing number stories
- Modeling equal-grouping number stories
- Solving division number stories
- Using estimation and the Trade-First subtraction algorithm
- Math Boxes 6.11
- Options for individualizing-*Using a Number Line*

6.12 Unit 6 Review and Assessment

- Getting started
- Math message follow-up
- Check in progress Unit 6

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments/Benchmarks:
6.1 Journal p131, Teacher observation, Three Addends Game
6.2 Slates, Journal p134, Problems 1 and 2, Teacher observation

6.3 Exit Slip, Home Link 6-3, Teacher observation, class discussion
6.4 Journal p141, Problems 1 and 2, Teacher observation
6.5 Math Boxes, Problem 1, Teacher observation, Number-Grid Game
6.6 Slates, Exit Slip
6.7 Math Message, Home Link 6-7
6.8 Journal p151, Problems 1 and 2, Math Master p419
6.9 Math Boxes, Problem 3, Array Bingo Game
6.10 Whole class discussion, teacher observation, Exit Slip, Journal p156
6.11 Oral, Slate, Written, Self, Open Response Assessments

Unit: 7 **Patterns and Rules**	**Suggested Sequence:** **February**

NJSLS:

2.NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s.
2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.MD.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2.MD.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
2.MD.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?
2.MD.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

Essential Questions:	***Enduring Understandings:***

• How can change be represented mathematically? • How are patterns of change related to the behavior of functions? • How can patterns, relations, and functions be used as tools best describe and help explain real-life situations? • How can technology help solve problems? • How do patterns help solve problems? • How are patterns expressed to show relationships? • Why is algebra important? How can it be of importance to students in their everyday lives?	• Algebraic and numeric procedures are interconnected and build on one another to produce a coherent whole. • Algebraic representation can be used to generalize patterns and relationships. • Patterns and relationships can be represented graphically, numerically, symbolically, or verbally. • Patterns provide insight into potential relationships. • Students will be able to explain their mathematical thinking by using critical thinking skills and making connections with mathematical relationships.

Knowledge, Skills, and Instructional Objectives:

7.1 Review counting by 2s, 5s, and 10s; extend this to counting by any number *n*; and provide experiences with describing patterns that result from counting
7.2 Provide experiences with finding complements of 10 and differences between 2-digit numbers and higher multiples of 10
7.3 Guide children as they build mental arithmetic skills for adding three or more 1- and 2-digit numbers
7.4 Guide children as they practice repeated doubling and halving
7.5 Provide experiences with exploring weights in pounds on a bath scale, developing readiness for division, and exploring area and patterns
7.6 Guide children as they measure length to the nearest centimeter and to the nearest inch
7.7 Guide children as they sort numerical data and arrange data in ascending or descending order, and as they find the middle value median for as et of numerical data
7.8 Guide children as they make a frequency table, line plot, and bar graph for a set of data; and as they find the median of a set of data
7.9 Assess children's progress on mathematical content through the end of Unit 7

Recommended Instructional Activities/Resources:

7.1 Patterns in Counting

- T510-515
- Getting started
- Math message follow-up
- Using a calculator to display counts
- Marking a Number Grid with Counts by n
- Taking timed inventory of addition and subtraction facts
- Math boxes 7.1
- Options for individualizing-*Counting by 2, 5 and 10, Minute Math*

7.2 Number- Grid Patterns and Arrow Paths

- T516-521
- Getting started
- Math message follow-up
- Drawing Horizontal and Vertical Patterns on the Number Grid Using Arrow Paths
- Solving Arrow-Path Puzzles
- Solving Number-Grid and Arrow- Path Puzzles
- Measuring Lengths with a Ruler
- Math boxes 7.2
- Options for individualizing-*Attribute Train Game*

7.3 Extending Complements of 10

- T522-527
- Getting started

- Math message follow-up
- Making 10s using a calculator
- Introducing *Hit the Target*
- Using estimation and the trade-first subtraction algorithm
- Math boxes 7.3
- Options for individualizing- *Playing Hit the Target*

7.4 Mental Arithmetic: A Basketball Game

- T528-532
- Getting started
- Math message follow-up
- Demonstrating *Basketball Addition*
- Playing *Basketball Addition*
- Using estimation and trade-first algorithm
- Math boxes 7.4
- Options for individualizing- *Playing Three Addends*

7.5 Patterns in Doubles and Halves

- T533-538
- Getting started
- Math message follow-up
- Doubling and Halving Numbers
- Playing *Hit the Target*
- Math boxes 7.5
- Options for individualizing-*Doubling and Halving Situations*

7.6 Exploring Weights and Scales, Equal Sharing, and Block Patterns

- T 539-544
- Getting started
- Math message follow-up
- Exploration A: Weighing with a Bath Scale
- Exploration B: Sharing Money
- Exploration C: Creating Two-Block Patterns
- Playing *Hit the Target*
- Math boxes 7.6
- Options for individualizing-*Minute Math*

7.7 Data Day: Standing Jumps and Arm Spans

- T545-549
- Getting started
- Math message follow-up
- Collecting and Recording Standing Long Jump Data
- Collecting and Recording Arm Span Data
- Playing *Array Bingo*
- Math boxes 7.7
- Options for individualizing-*Solving Number Stories*

7.8 Middle Value (Median) of a Set of Data

- T550-555
- Getting started
- Math message follow-up
- Sorting the Standing Jump Data

- Finding the Median Length of the Standing Long Jump
- Measuring objects
- Math boxes 7.8
- Options for individualizing- *Median*

7.9 Frequency Distributions

- T 556-561

Day 1

- Getting started
- Math message follow-up
- Making a Frequency Table of Arm Spans
- Making a line plot of arm spans

Day 2

- Making a bar graph of arm spans
- Finding the median length of arm spans
- Playing *Basketball Addition*
- Math boxes 7.9
- Options for individualizing-*Making a "Quick" Graph*

7.10 Unit 7 Review and Assessment

- T562-567
- Getting Started
- Math message follow-up
- Check in progress Unit 7

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:
Technology:
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CRP11. Use technology to enhance productivity.

Suggested Assessments/Benchmarks:
7.1 Math Message, Journal p161
7.2 Journal p163, Hit the Target Game

7.3 Slates, Teacher observation, Exit Slip 7.4 Math Boxes, Problem 5, Teacher observation, Hit the Target Game 7.5 Math Boxes, Problem 3, Teacher observation 7.6 Math Message, Array Bingo, Teacher observation 7.7 Math Boxes, Problem 1, Slates 7.8 Mental Math and Reflexes, Exit Slip, Teacher observation, Soccer Spin Game 7.9 Oral, Slate, Written, Self, Open Response Assessments

Unit: 8 **Fractions**	**Suggested Sequence:** **March**
NJSLS: 2.OA.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends. 2.G.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words *halves*, *thirds*, *half of*, *a third of*, etc., and describe the whole as two halves, three thirds, four fourths.	

Recognize that equal shares of identical wholes need not have the same shape.

Essential Questions:	***Enduring Understandings:***
• How are fractions used in real life? • How many ways can we use models to determine and compare equivalent fractions? • How are models used to show how fractional parts are combined or separated? • How are concrete materials and drawings used to show understanding of fractions? • What is the meaning of a fraction and its numerator and denominator? • How are fractions represented and compared?	• There are many ways to represent a number. • Number sense develops through experience. • Numerical fluency includes both the understanding of and the ability to appropriately use numbers. • A quantity can be represented numerically in various ways.

Knowledge, Skills, and Instructional Objectives:

8.1 Review basic fraction concepts
8.2 Guide children as they explore the link of a fraction amount to the size of the ONE, or whole; prepare for multiplication and division; and introduce the concept of volume
8.3 Guide children as they use fractions to name parts of collections
8.4 Provide experiences with the idea that many different fractions can name the same fractional part of a whole
8.5 Guide children as they find pairs of equivalent fractions by using region models
8.6 Guide children as they compare fractions by using region models
8.7 Provide experiences with number stories involving fractions
8.8 Assess children's progress on mathematical content through the end of Unit 8

Recommended Instructional Activities/Resources:

8.1 Equal Parts of ONE

- T 578-583
- Getting started
- Math message follow-up
- Folding squares into equal parts
- Reviewing basic fraction concepts
- Writing fractions for parts of regions
- Making up and solving multiplication and division number stories
- Math boxes 8.1
- Options for individualizing-*Dividing Shapes into Equal Parts*

8.2 Exploring Fractions, Multiplication and Division, and Volume

- T 584-589
- Getting started
- Math message follow-up
- Comparing Pattern Blocks, One of Which Represents ONE
- Exploration A: Comparing Pairs of Shapes When One Shape Represents ONE
- Exploration B: Making Arrays with Geoboard Fences
- Exploration C: Finding the Volume of Base-10 Structures
- Playing *Array Bingo*
- Math boxes 8.2
- Options for individualizing-*Array Bingo*

8.3 Collections of Things

- T590-593
- Getting started

- Math message follow-up
- Reviewing Fractions with Reference to Collections of Objects
- Identifying Fractions of Collections of Pennies
- Finding Fractions of Collections of Things
- Writing Fractions for Parts of Regions
- Math boxes 8.3
- Options for individualizing-*Making a Collection of "Collective Terms"*

8.4 Equivalent Fractions

- T 594-597
- Getting started
- Math message follow-up
- Making a Display of Equivalent Fractions
- Math Boxes 8.4
- Options for Individualizing-*Playing Name That Number*

8.5 Equivalent Fractions Using Fraction Cards

- T 598- 601
- Getting started
- Math message follow-up
- Using Fraction Cards to Review and Extend Fraction Concepts
- Playing the *Equivalent Fractions* game
- Fractions of Collections of Things
- Math Boxes 8.5
- Options for individualizing-*Equivalent Fractions Game*

8.6 Comparing Fractions

- T 602-605
- Getting started
- Math message follow-up
- Identifying fractions that are less than , and equivalent to ½
- Playing *Fraction Top-It*
- Playing the *Equivalent Fractions Game*
- Math boxes 8.6
- Options for individualizing-*Advanced Version of Fraction Top- It*

8.7 Fraction Number Stories

- T606 – 609
- Getting started
- Math message follow-up
- Making up and Solving Fraction Number Stories
- Solving Fraction Number Stories
- Playing *Fraction Top-It*
- Math boxes 8.7
- Options for individualizing-*Fraction Number Stories*

8.8 Unit 8 Review and Assessment

- T 610 – 615
- Getting started
- Math message follow-up

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

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Suggested Assessments/Benchmarks:
8.1 Journal p184, Class discussion, teacher observation, slates
8.2 Exit Slip, teacher observation
8.3 Math Boxes, Problem 4, Teacher observation, Journal p193
8.4 Math Boxes, Problem 3, Name That Number Game, teacher observation
8.5 Exit Slip, Slates, Equivalent Fractions Game, Teacher observation
8.6 Math Boxes, Problem 2, Equivalent Fractions Game, Teacher observation
8.7 Journal p206, Problems 1 and 2, Fraction Top-It Game, teacher observation
8.8 Oral, Slate, Written, Self, Open Response Assessments

Unit: 9 **Measurement**	**Suggested Sequence:** **End of March- April**

NJSLS:

2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.

1.NBT.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

2.MD.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

2.MD.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.

2.MD.3 Estimate lengths using units of inches, feet, centimeters, and meters.

2.MD.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

2.G.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

Essential Questions:	***Enduring Understandings:***
• How can measurements be used to solve problems? • Why do we measure? • Why is there a need for standardized units of measurement? • How does what is measured influence how it is measured? • How exact does a measurement have to be? • What are tools of measurement and how can they be used?	• Everyday objects have a variety of attributes, each of which can be measured in many ways. • What we measure affects how we measure it. • Measurements can be used to describe, compare, and make sense of phenomena. • Measurement describes the attributes of objects and events. • Standard units of measure enable people to interpret results or data. • All measurements have some degree of uncertainty.

Knowledge, Skills, and Instructional Objectives:

9.1 Provide review for the concept of nonstandard units of measure; and introduce yard and meter

9.2 Provide review for measuring with inches, feet, centimeters, and decimeters; guide children as they begin a table of equivalent linear measures

9.3 Guide children as they investigate the idea of accuracy, explore 1/8 inch, 1/16 inch, and ½ centimeter on a ruler, and explore measuring to the nearest half-inch and half-centimeter

9.4 Provide experiences with finding perimeters by measuring the nearest centimeter or inch

9.5 Provide experiences with identifying the mile and kilometer as standard units for longer distances and solving problems about road-map distances

9.6 Guide children as they explore the capacities of cylinders, find the areas of shapes by using inch and centimeter grids, and explore measuring tools and units of measure

9.7 Provide experiences with the concept of area, distinguishing between area and perimeter, and finding areas of

rectangular figures by counting squares
9.8 Provide experiences with relationships among units of capacity and identifying equivalent measures of capacity
9.9 Guide children as they compare weights by feel, identify purposes of various scales, explore with units of weight and equivalent measures, and weigh objects
9.10 Assess children's progress on mathematical content through the end of Unit 9

Recommended Instructional Activities/Resources:

9.1 Measuring with Yards and Meters
- T 630 – 635
- Getting started
- Math message follow-up
- Measuring Length with a Nonstandard Unit
- Introducing Yard and Meter as Standard Lengths
- Checking Estimates by Measuring Distances with Yardsticks
- Math boxes 9.1
- Options for individualizing

9.2 Linear Measures
- T 636 - 641
- Getting started
- Math message follow-up
- Measuring to the Nearest Inch and Centimeter
- Revisiting Foot and Decimeter
- Beginning a Table of Equivalent Measures
- Measuring in Feet and Inches, Decimeters and Centimeters
- Math boxes 9.2
- Options for individualizing

9.3 Fractional Untis of Length
- T 642 – 647
- Getting started
- Math message follow-up
- Discussing the Need for Accurate Measurements
- Introducing Fractional Units of Length
- Measuring to the Nearest Half-Inch and Half-Centimeter
- Math boxes 9.3
- Options for individualizing

9.4 Perimeter
- T 648 – 651
- Getting started
- Math message follow-up
- Measuring Distances around Shapes
- Investigating Perimeter of Rectangles
- Investigating Perimeters of Polygons
- Math boxes 9.4
- Options for individualizing

9.5 Measuring Longer Distances
- T 652-654
- Getting started
- Math message follow-up
- Introducing Units Used to Measure Longer Distances

- Introducing Road-Map Stories
- Solving Road-Map Stories
- Finding Perimeters
- Math boxes 9.5
- Options For Individualizing

9.6 Measures All Around

- T 656-660
- Getting started
- Math message follow-up
- Listing Things That Can Be Measured, Measuring Tools, and Units of Measure
- Math boxes 9.6
- Options for individualizing

9.7 Exlporing Capacity Area, and Pattern-Block Walls

- T 661 –666
- Getting started
- Math message follow-up
- Exploration A: discovering Which Cylinder Holds More
- Exploration B : Measuring Area with a Centimeter Grid and an Inch Grid
- Exploration C: Building and Drawing a Pattern-Block Wall
- Playing the *Equivalent Fractions Game* or *Fraction Top-It*
- Math boxes 9.7
- Options for Individualizing

9.8 Area

- T667-671
- Getting started
- Math message follow-up
- Developing the Concept of Area
- Comparing Units Used to Measure Area and Perimeter
- Investigating the Relationships between Perimeter and Area
- Finding the Area of Block Letters
- Challenge: Solving Checkerboard Problems
- Math boxes 9.8
- Options for Individualizing

9.9 Capacity

- T 672- 677
- Getting started
- Math message follow-up
- Demonstrating Equivalent U.S. Customary Units of Capacity
- Reviewing Equivalent Metric Units of Capacity
- Completing “What’s My Rule?” Tables of Equivalent Measures of Capacity
- Math boxes 9.9
- Options for individualizing

9.10 Weight

- T 678-682
- Getting started
- Math message follow-up
- Discussing the Spring Scale and the Bath Scale
- Discussing Units of Weight

- Determining How Many Pennies Weigh 1 Ounce
- Deciding Which Objects Weigh the Same Amount
- Solving Problems about Weight
- Math boxes 9.10
- Options for Individualizing

9.11 Unit 9 Review and Assessment

- T 683-687
- Getting Started
- Math message follow-up
- Math boxes 9.11
- Check in Progress Unit 9

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Suggested Assessments/Benchmarks:

9.1 Mental Math and Reflexes, Teacher observation
9.2 Journal p212, Name That Number Game, teacher observation
9.3 Journal p214, Problems 1-3, Teacher observation, Equivalent Fraction Game
9.4 Journal p216, Problem 5, Home Link 9-4
9.5 Mental Math and Reflexes, Exit Slip
9.6 Exit Slip, Teacher observation
9.7 Math Boxes, Problem 3, slates, Equivalent Fractions Game, Teacher observation
9.8 Journal p224, Problems 4 and 5, Teacher observation
9.9 Math Masters, p462
9.10 Oral, Slate, Written, Self, Open Response Assessments

Unit: 10 **Decimals and Place Values**	**Suggested Sequence:** **April**

NJSLS:

2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

2.NB.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

2.NBT.1.a: 100 can be thought of as a bundle of ten tens — called a "hundred."

2.NBT.1.b: The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

2.NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s.

2.NBT.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

2.NBT.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.

2.NBT.8 Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900

2.MD.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*

2.MD.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

2.G.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words *halves*, *thirds*, *half of*, *a third of*, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape

Essential Questions:	***Enduring Understandings:***
• How can models help us understand the addition and subtraction of decimals? • How would you compare and order whole numbers and decimals through hundredths?	• There are many ways to represent a number. • Number sense develops through experience. • Numerical fluency includes both the understanding of and the ability to appropriately use numbers. • A quantity can be represented numerically in various ways.

Knowledge, Skills, and Instructional Objectives:

10.1 Review notation and equivalencies for money amounts

10.2 Review estimation, dollars-and-cents notation, and names for a dollar, a dime, and a penny

10.3 Guide children as they enter money amounts into a calculator and interpret calculator displays

10.4 Provide experiences with comparing prices and solving problems about price differences
10.5 Provide experiences with estimating costs and then calculating exact costs
10.6 Provide experience making change by counting up and estimating totals by rounding to the nearest 10 cents
10.7 Guide children as they explore finding areas of irregular shapes, make polygons with trapezoids, and form fractions on a geoboard
10.8 Develop place-value concepts, and connect place value in money with place value in base-10 blocks
10.9 Develop place-value concepts by using place-value tools
10.10 Provide experiences with place-value concepts to ten-thousands
10.11 Introduce the use of parentheses in number models
10.12 Assess children's progress on mathematical content through the end of Unit 10

Recommended Instructional Activities/Resources:

10.1 Money

- T698 – 701
- Getting started
- Math message follow-up
- Assessing Knowledge of Values of Coins and Bills
- Assessing Understanding of Exchange Values
- Making Equivalent Amounts with Coins and Bills
- Math boxes 10.1
- Options for individualizing-*Spinning for Money*

10.2 Decimal Notation for Pennies and Dimes

- T 702 – 707
- Getting started
- Math message follow-up
- Reviewing Decimal Notation for Money
- Pennies and Dimes as Fractional Parts of a Dollar
- Matching a Dollar, a Dime, and a Penny with Their Names
- Calculating Word Values
- Math boxes 10.2
- Options for Individualizing-*Relationships among pennies, dimes and dollars*

10.3 Money Amounts with a Calculator

- T 708 – 713
- Getting started
- Math message follow-up
- Entering Amounts Greater Than $1 into a Calculator
- Entering Amounts Less Than $1 into a Calculator
- Examining Variations in Decimals Displayed on Calculators
- Playing *Pick-a-Coin*
- Math boxes 10.3
- Options for Individualizing-*Pick a Coin*

10.4 Using a Calculator to Solve Problems with Money

- T 714 – 717
- Getting started
- Math message follow-up
- Discussing the Then-and-Now Poster
- Making Rough Comparison between Then-and-Now Prices
- Using a Calculator to Solve Then-and-Now Problems
- Making Up and Solving Then-and-Now Problems

- Playing *Pick-a-Coin*
- Math boxes 10.4
- Options for individualizing-*Comparing Prices*

10.5 Estimating and Finding Exact Costs

- T 718-721
- Getting started
- Math message follow-up
- Estimating Costs
- Calculating Exact Costs with a Calculator
- Estimating Costs and Finding Exact Costs
- Math boxes 10.5
- Options for individualizing-*Purchasing Items from a Classroom Store*

10.6 Making Change

- T 722-726
- Getting started
- Math message follow-up
- Using Coins and Bills to Make Change from $10.00
- Shopping for Groceries
- Playing the *Equivalent Fractions Game or Fraction Top-It*
- Math boxes 10.6
- Options for individualizing

10.7 Exploring Area, Polygons, and Geoboard Fractions

- T 727-731
- Getting started
- Math message follow-up
- Exploration A: Tracing Areas of Handprints and Footprints
- Exploration B: Making Pattern-Block Worktables
- Exploration C: Forming Fractions on the Geoboard
- Playing *Pick-a-Coin*
- Math boxes 10.7
- Options for individualizing-*Minute Math*

10.8 Place Value

- T 732 – 735
- Getting started
- Math message follow-up
- Representing 3- and 4-digit Numbers with Base-10 Blocks
- Reviewing the role of 0 as a Placeholder
- Comparing Place Value with Base-10 Blocks and Money
- Playing the *Money Exchange Game*
- Math boxes 10.8
- Options for individualizing-*Building Base 10 Structures*

10.9 Place-Value Tools

- T 736 – 741
- Getting started
- Math message follow-up
- Making a Place-Value Tool
- Establishing a Routine for Place-Value tools
- Displaying Counts with Place-Value Tools

- Displaying and Reading Numbers with Place-Value tools
- Practicing Displaying and Reading Number with Place-Value Tools
- Counting $100, $10 and $1 Bills
- Math boxes 10.9
- Options for individualizing-*Place Value Tools*

10.10 Place Value Notation for Ten-Thousands

- T 742 – 746
- Getting started
- Math message follow-up
- Extending Place-Value Concepts to Ten –Thousands
- Reviewing 0 as a Placeholder
- Reviewing Relationships among Place Values
- Solving 4- and 5- Digit Place-Value Problems
- Playing the *Money Exchange Game*
- Math boxes 10.10
- Options for individualizing-*Digit Game*

10.11 Grouping with Parentheses

- T 747- 751
- Getting started
- Math message follow-up
- Introducing the Use of Parentheses in Number Models
- Solving Parentheses Puzzles and Problems
- Displaying and Reading 4- and 5-digit Numbers
- Math boxes 10.11
- Options for individualizing-*Solving Parenthesis Puzzles*

10.12 Unit 10 Review and Assessment

- T 752-757
- Getting started
- Math message follow-up
- Math boxes 10.12
- Check in progress Unit 10

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:

Technology:

8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.

8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments/Benchmarks:
10.1 Journal p231, Problem 1, Spinning For Money Game, Teacher observation
10.2 Math Message, Journal p296-297, Home Link 10-2
10.3Math Boxes, Problem 2, Slates, Pick-a-Coin Game, Teacher observation
10.4 Math Masters, p469, Pick-a-Coin Game, teacher observation
10.5 Math Boxes, Problem 3, slates, teacher observation
10.6 Exit Slip, Slates, teacher observation, Math Boxes, Problem 3
10.7 Exit Slip, teacher observation, Home Link 10-7
10.8 Mental Math and Reflexes, Exit Slip, Teacher observation
10.9 Math Boxes, Problem 5, Teacher observation
10.10 Journal p258, Problems 2-5,
10.11 Math Boxes, Problem 2, Home Link 10-11
10.12 Oral, Slate, Written, Self, Open Response Assessments

Unit: 11 **Whole-Number Operations Revisited**	**Suggested Sequence:** **May**

NJSLS:

2.OA.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

2.NB.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

2.NBT.1.a: 100 can be thought of as a bundle of ten tens — called a "hundred."

2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.

1.NBT.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.

2.MD.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

Essential Questions:

- How do operations affect numbers?
- How can we use math information to choose an operation?
- What makes a computational strategy both effective and efficient?
- How can we decide when to use an exact answer and when to use an estimate?
- How can technology help solve problems?
- How do patterns help solve problems?
- How can students use modeling to identify math processes?
- What is the best solution to solve problems?
- How do I decide what strategy will work best in a given problem situation?
- What are the mathematical properties that govern addition and multiplication? How would you use them?
- How can multiples be used to solve problems?
- What strategies aid in mastering multiplication and division facts?
- How can I use the array model to explain multiplication?
- How can I relate what I know about skip counting to help me learn the multiples of 2,5,10?
- How are repeated addition and multiplication related?

Enduring Understandings:

- Computational fluency includes understanding the meaning and the appropriate use of numerical operations.
- The magnitude of numbers affects the outcome of the operations on them.
- One representation may sometimes be more helpful than another; and used together, multiple representations give a fuller understanding of the problem.
- Students will be able to explain their mathematical thinking by using critical thinking skills and making connections with mathematical relationships.
- Math processes can give students the "tools" needed to help them become problem-solvers.
- Different math approaches can yield the same results.
- Operations create relationships between numbers.
- The relationships among the operations and their properties promote computational fluency.
- There can be different strategies to solve a problem, but some are more effective and efficient than others.
- The context of a problem determines the reasonableness of a solution.

• How can I use what I know about repeated subtraction, equal sharing, and forming equal groups to solve division problems? • How does my knowledge about multiplication facts help me to solve problems? • How do I know when a result is reasonable? • What is the relationship between solving problems and computation?	

Knowledge, Skills, and Instructional Objectives:

11.1 Guide children as they review finding estimates for sums of money, and calculate values of coin and bill combinations in number stories
11.2 Guide children as they review making change by counting up, and solve comparison number stories with money
11.3 Introduce and provide practice with the trade-first subtraction algorithm
11.4 Provide experiences with finding the total number of items in several equal groups by multiplying
11.5 Provide experiences with solving division number stories; and introduce number models for division stories
11.6 Introduce multiplication fact; and provide review and practice with multiplying by 2, 5, and 10
11.7 Introduce 1s and 0s multiplication facts; guide children as they discover patterns in multiplication facts
11.8 Introduce multiplication and division fact families; provide practice with multiplication and division facts
11.9 Provide practice with multiplication and division facts
11.10 Assess children's progress on mathematical content through the end of Unit 11

Recommended Instructional Activities/Resources:

11.1 Addition Number Stories with Dollars and Cents

- T 770-775
- Getting started
- Math message follow-up
- Solving Problems with 2- and 3-Digit Addends
- Playing *Hit the Target*
- Math boxes 11.1
- Options for individualizing-*Creating Number Stories*

11.2 Subtraction Number Stories with Dollars and Cents

- T 776- 781
- Getting started
- Math message follow-up
- Counting up to the Next Dollar
- Counting up to Larger Dollar Amounts
- Solving Comparison Problems
- Calculating Sums of Money
- Math boxes 11.2
- Options for individualizing-*Hit the Target*

11.3 Multiples of Equal Groups

- T 781-787
- Getting started
- Math message follow-up
- Reviewing Multiplication Ideas and Terms
- Making up and Solving Number Stories about Multiples of Equal Groups
- Math boxes 11.3
- Options for individualizing-*Array Bingo*

11.4 Division Number Models
- T 788-794
- Getting started
- Math message follow-up
- Introducing Number Models for Division Stories
- Making up and Solving Division Number Stories
- Solving Division Number Stories
- Math boxes 11.4
- Options for individualizing

11.5 Multiplication Facts
- T 795-799
- Getting started
- Math message follow-up
- Discussing the Meaning of Multiplication Fact
- Multiplying by 2, 5, and 10
- Listing Multiplication Facts from 2s to 10s
- Using Arrays to Find Products
- Math boxes 11.5
- Options for Individualizing-*Multiplication Draw*

11.6 Products Table
- T 800 –805
- Getting started
- Math message follow-up
- Introducing the Products Table
- Discussing and Recording 1s and 0s Products
- Recording Other Products in the Products Table
- Practicing Multiplication facts with 2, 5, and 10
- Cutting out Fact Triangles
- Math boxes 11.6
- Options for Individualizing-*Minute Math*

11.7 Multiplication/Division Fact Families
- T 806-811
- Getting started
- Math message follow-up
- Making Division Stories from Multiplication Stories
- Introducing Fact Families for Multiplication and Division
- Completing Fact Families for Fact Triangles
- Practicing with Multiplication/ Division Fact Triangles
- Multiplying and Dividing with 2, 5, and 10
- Math boxes 11.7
- Options for Individualizing-*Number Stories*

11.8 Multiplication/Division Fact Practice
- T 812-815
- Getting started
- Math message follow-up
- Playing a Multiplication Version of *Beat the Calculator*
- Practicing Multiplication with Fact Triangles
- Math boxes 11.8

- Options for Individualizing-*Writing Fact Families*

11.9 Climate Comparisons

- T 816 –820
- Getting started
- Math message follow-up
- Discussing the Map of Rainy or Snowy Days
- Comparing the Precipitation in Various Places on the Map
- Play *Beat the Calculator*
- Practicing Multiplication and Division with Fact Triangles
- Math boxes 11.9
- Options for individualizing

11.10 Unit 11 Review and Assessment

- T 821-825
- Getting started
- Math message follow-up
- Math boxes 11.10
- Check in progress Unit 10

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:

Technology:

8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.

8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments/Benchmarks:

11.1 Math Master p457, Hit the Target Game, Teacher Observation
11.2 Mental Math & Reflexes, Exit Slip, Teacher Observation
11.3 Mental Math & Reflexes, Journal p269, Teacher Observation
11.4 Slates, Exit Slip, Math Message, Journal p273
11.5 Math Message, Teacher Observation
11.6 Journal p278, Slates, Teacher Observation
11.7 Journal p277, Slates, Math Boxes Problem 5

11.8 Math Boxes Problem 2, Teacher Observation 11.9 Slates, Exit Slip, Beat the Calculator Game, Teacher Observation 11.10 Oral, Slate, Written, Self, Open Response Assessments

Unit: 12 **Year-End Reviews and Extensions**	**Suggested Sequence:** **End of May-June**

NJSLS:

2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.

1.NBT.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

2.MD.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.

2.MD.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

2.MD.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*

2.MD.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

Essential Questions:	***Enduring Understandings*:**
• What are tools of measurement and how are they used? • What are different models of and for multiplication and division? • What questions can be answered using multiplication and division? • What are efficient methods for finding products and quotients? • What do you think is the connection between data analysis, probability, and discrete math and the real world? • How can students use data analysis,	• The choice of measurement tools depends on the measureable attribute and the degree of precision desired. • Computation involves taking apart and combing numbers using a variety of approaches. • Flexible methods of computation involve grouping numbers in strategic ways. • Proficiency with basic facts aids estimation and computation of smaller and larger numbers. • Being able to read and interpret data are critical elements needed in real-world situations so that students will be able to make decisions and

probability, and discrete math to identify math processes? • How can collecting information be useful in solving problems? • How can the collection, organization, interpretation, and display data be used to answer questions?	inferences. • Using discrete mathematics allows students to learn to interpret and organize information. • The message conveyed in data depends on how the data is collected, represented, and summarized.

Knowledge, Skills, and Instructional Objectives:

12.1 Guide children as they review time equivalencies and calendar facts
12.2 Guide children s they review reading times in different ways, show time to the nearest five minutes on a clock face, and calculate times relative to a given time
12.3 Provide experiences with events on a timeline
12.4 Provide review and extend shortcuts and strategies for learning multiplication facts; and provide practice for multiplication facts
12.5 Guide children as they review multiplication/division fact families, and investigate the relationship between multiplication and division
12.6 Provide experience with reading, creating, and interpreting bar graphs; and guide children as they find the range and middle value (median) of a data set
12.7 Guide children as they organize a set of data with a line plot and frequency table, display a set of data with a bar graph and identify the median and mode
12.8 Assess children's progress on mathematical content through the end of Unit 12

Recommended Instructional Activities/Resources:

12.1 The Calendar
- T 836 –839
- Getting started
- Math message follow-up
- Reviewing calendar facts
- Administering a Time-Telling Assessment
- Practicing Multiplication and Division Facts Using Fact Triangles
- Math boxes 12.1
- Options for Individualizing-*Minute Math*

12.2 Clock Skills
- T 840 –844
- Getting started
- Math message follow-up
- Reviewing Clock Skills
- Discussing Alternate Names for Times
- Finding the Time before and after a Given Time
- Practice Using Alternate Names for Times
- Solving Multidigit Addition and Subtraction Problems
- Math boxes 12.2
- Options for individualizing-*Telling Time in 5 Minutes*

12.3 Timelines
- T 845 –848
- Getting started
- Math message follow-up
- Discussing Ways in Which People Communicate with One Another across Distances

- Examining a Timeline as a Way of Displaying Events in Sequential Order
- Showing Dates for Inventions on a Timeline
- Calculating Elapsed Time for Events on the Timeline
- Math boxes 12.3
- Options for Individualizing-*Creating a Timeline*

12.4 Practice Multiplication Facts

- T 849 –852
- Getting started
- Math message follow-up
- Reviewing Multiplication Shortcuts and Strategies
- Practicing Multiplication Facts with Fact Triangles
- Administering a Written Assessment for the "Easier" Multiplication Facts
- Math boxes 12.4
- Options for Individualizing-*9 facts shortcut*

12.5 Division from Multiplication

- T 853-857
- Getting started
- Math message follow-up
- Using Fact Triangles for Division
- Solving Related Multiplication/ Division Fact Problems
- Playing *Addition Draw*
- Math boxes 12.5
- Options for individualizing-*What's My Rule?*

12.6 Comparing Speeds of Animals and People

- T 858 – 863
- Getting started
- Math message follow-up
- Finding the Middle Value (Median) and Range of the Distances
- Comparing Distances an Adult Can Cover by Various Modes of Travel
- Practicing Division Facts with Fact Triangles
- Math boxes 12.6
- Options for Individualizing

12.7 The Mode of a Set of Data

- Getting started
- Math message follow-up
- Making a Line Plot, Frequency Table, and Bar Graph of Height Changes
- Math boxes 12.7
- Options for Individualizing

12.8 Unit 12 Review and Assessment

- T 869-873
- Math message follow-up
- Math boxes 12.8
- Check in progress Unit 12

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Technology/21st Century/Cross-curricular Connections:
Technology:

8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments/Benchmarks:
12.1 Math Message, Journal p289
12.2 Exit Slip, Journal p292
12.3 Mental Math & Reflexes, Journal p295
12.4 Mental Math & Reflexes, Exit Slip, Teacher observation, Fact Triangles
12.5 Journal p299, Math Message, Fact Triangles, Teacher Observation
12.6 Journal p303, Math Message, Teacher Observation
12.7 Journal p307 Problems 2-5, Teacher Observation
12.8 Oral, Slate, Written, Self, Open Response Assessments

Third Grade

Theme/Unit: **Unit 1: Routines, Review and Assessment**	**Suggested Sequence: 20 days**

NJSLS:

3.OA.9 – Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

3.NBT.1 – Use place value understanding to round whole numbers to the nearest 10 or 100

3.NBT.2 – Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction

3.MD.1 – Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g. by representing the problem on a number line diagram

3.MD.3- Draw a scaled picture graph and a scaled bar graph to represent a set of date with several categories. Solve one- and two- step "how many more" and "how many less" programs using information presented in a scaled bar graph

3.MD.4 – Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scaled is marked off in appropriate units – whole numbers, halves, and quarters.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.

Measurement is a tool to quantify a variety of phenomena.

Algebra provides language through which we communicate the patterns in mathematics.

Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:

- Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions.
- Understanding place value can lead to number sense and efficient strategies for computing with numbers.
- Measurement processes are used in everyday life to describe and quantify the world.
- Data displays describe and represent data in alternative ways.

Enduring Understandings:

- How can different strategies be helpful when solving a problem?
- How's a digit's position affect its value?
- Why does "what" we measure influence "how" we measure?
- Why display data in different ways?

Knowledge, Skills, and Instructional Objectives:

•1.1 Review types and uses of numbers
•1.2 Introduce Math Message routine and review patterns on number grids
•1.3 Introduce the Student Reference Book and establish set of work rules
•1.4 Review telling time, measuring lengths, using calculators and identify and draw 2-dimensional shapes
•1.5 Review data concepts and find data landmarks and use graphs to draw conclusions
•1.6 Review the idea that there are many names for one number
•1.7 Introduce the vocabulary of chance
•1.8 Identify number-grid patterns and use them to find differences between pairs of numbers

•1.9 Review adding, subtracting, and skip counting forward and backward on a calculator and practice place value skills
•1.10 Review money amounts with coins, compare money amounts, and write dollars and cents notation
•1.11 Solve problems involving money, determine whether an exact answer or estimate is needed, and practice estimating
•1.12 Explore number patterns
•1.13 Review telling time and finding elapsed time and introduce the Length-of-Day project
•1.14 Assess children's progress on mathematical content through the end of Unit 1

Instructional Materials/Resources:

1.1 Numbers All Around Museum
- Numbers All Around Museum
- Number Hunt

1.2 Number Grids
- Find Missing Numbers on a Number Grid
- Number Grid puzzles

1.3 Introducing the Student Reference Book
- Rules for Working With Others
- Looking up Information in the SRB
- Minute Math

1.4 Tools for Mathematics
- Review Telling Time
- Addition Top-It

1.5 Analyzing and Displaying Data
- Making Tally Charts and Bar Graphs to Display the Class Data
- Introducing the Math Boxes Routine

1.6 Equivalent Names
- Name Collection Box Problems
- Name that Number

1.7 Finding Differences
- Finding the Differences between Two Numbers
- Skip counting on a Number Grid

1.8 Calculator Routines
- Skip Counting with a Calculator
- Playing Beat The Calculator

1.9 Money
- Reviewing Dollars-and-Cents Notation
- Reviewing the < and > symbols

1.10 Solving Problems with Dollars and Cents
- Simulating a Shopping Trip
- Calculating the Value of a Coin Collection

1.11 Patterns
- Reviewing Frames-And-Arrows Routines
- Solving Pattern Puzzles

Solving Tic-Tac-Toe Addition Problems

Suggested Vocabulary:
Millions, number patterns

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

9.2.4.A.3 Explain how income affects spending and take-home pay.

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Create number puzzle challenges to exchange with peers	

Suggested Assessments:

- Journal 1 p1 & 2, Home Link
- Journal 1 p3, Home Link
- Slates, Journal 1 p4
- Slates, Journal 1 p5, Home Link
- Slates, Journal 1 p56 &7, Home Link
- Journal 1 p6 & 7, Home Link
- Journal 1 p9, Home Link, Name That Number Game-Teacher Observation
- Journal 1 p11, Home Link
- Journal 1 p13, Exit Slip, Home Link, Number-Grid Difference Game-Teacher Observation
- Journal 1 p15 & 16, Beat the Calculator Game-Teacher Observation
- Journal 1 p17, Coin Top-It Game-Teacher Observation, Home Link

Theme/Unit: **Unit 2 : Adding and Subtracting Whole Numbers**	**Suggested Sequence: 15 days**

NJSLS:

3.0A.8.- Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

3.0A.9.- Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example/)* observe that 4 nines a number is always even, and explain why 4 times a number can be decomposed into two equal addends.

3.NBT.1.- Use place value understanding to round whole numbers to the nearest 10 or 100.

3.NBT.2.- Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction .

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.

Algebra provides language through which we communicate the patterns in mathematics.

Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values. • Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions. • Understanding place value can lead to number sense and efficient strategies for computing with numbers.	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • How does a digit's position affect its value?

Knowledge, Skills, and Instructional Objectives:

•2.1 Review fact families and number families and the inverse relationship between addition and subtraction
•2.2 Review ways in which basic addition and subtraction facts are used to solve problems with larger numbers
•2.3 Review and solve "What's My Rule?" problems
•2.4 Use parts-and-total diagrams to help solve parts-and-total number stories
•2.5 Use change diagrams to help solve change number stories
•2.6 Use comparison diagrams to help solve comparison number stories
•2.7 Make ballpark estimates and model and practice the partial-sums algorithm for 2 and 3 digit numbers
•2.8 Review making ballpark estimates and review counting-up and trade-first subtraction algorithms
•2.9 Solve number stories having three or more addends
•2.10 Assess children's progress on mathematical content through the end of Unit 2

Suggested Vocabulary;	**Technology/21st Century/Cross-curricular Connections:**
Part and total Diagrams estimate	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and

	impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

2.1 Fact Families
- Reviewing the Addition/Subtraction Facts Table
- Reviewing Frames-and-Arrows Problems having Two Rules

2.2 Extensions of Addition and Subtraction Facts
- Practicing Fact Extensions
- Calculating Complements
- Equivalent Names for Numbers

2.3 What's My Rule?
- Reviewing Variations of the "What's My Rule?" Routine
- Completing "What's My Rule?" Tables

2.4 Parts-and-Total Number Stories
- Solving Parts and Total Number Stories

2.5 Change Number Stories
- Solving a Change-to-More/Less Number Story
- Solving a Change-to-Number Stories
- Using Parts-and-Total diagrams to Solve Number Stories

2.6 Comparison Number Stories
- Solving Comparison Number Stories

2.7 The Partial-Sums Algorithm
- Making Ballpark Estimates
- Using Base 10 Blocks to Model the Partial-Sums Method for 3-Digit Addends
- Practicing the Partial-Sums Algorithm

2.8 The Trade-First Subtraction Algorithm
- Using Base 10 Blocks to Model the Trade-First Algorithm with 3-Digit Subtraction
- Solving Multidigit Addition Problems

2.9 Addition With Three or More Addends
- Adding Three or Four Numbers in Any Order

Solving Number Stories Having Three Addends

Extension Strategies/Activities: Create "What's My Rule" problems for classmates to solve	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Suggested Assessments:
•Journal 1 p30, Home Link
•Slates, Journal 1 p32, Home Link
•Journal 1 p34, Home Link
•Exit Slip, Journal 1 p36 & 37, Home Link
•Journal 1 p39 & 40, Home Link, Number Grid Difference Game-Teacher Observation
•Journal 1 p42, Math Masters p407
•Journal 1 p45, Home Link, Target 50 Game-Teacher Observation
•Journal 1 p47 & 50, Home Link
•Progress Check 2

Theme/Unit: **Unit 3 : Linear Measures and Area**	**Suggested Sequence: 15 Days**

NJSLS:
3.0A.3. - Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem
3.0A.5. - Apply properties of operations as strategies to multiply and divide. *Examples: If 6 X 4 = 24 is known, then 4 X 6 = 24 is also known. (Commutative property of multiplication.) 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.) Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) = (8 x 2) = 40 + 16 = 56 (Distributive property*
3.0A.9.- Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 nines a number is always even, and explain why 4 times a number can be decomposed into two equal addends.
3.NBT.2.- Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
3.NF.2.- Understand a fraction as a number on the number line; represent fractions on a number line diagram.
3.NF.2a.- Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.
3.NF.2b. - Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.
3.NF.3a.- Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
3.MD.1 - Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g. by representing the problem on a number line diagram
3.MD.4.- Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot where the horizontal scale is marked off in appropriate units . – whole numbers, halves, or quarters
3. MD.5. - Recognize area as an attribute of plane figures and understand concepts of area measurement.
3. MD.5a.- A square with size length 1 unit, called “a unit square”, is said to have “one square unit” of area, and can be used to measure area.
3. MD.5b - A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of an square units.
3. MD.6. - Measure areas by counting unit squares (square cm, square m, square in, square fit, and non-

standard units).

3. MD.7a.- Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.

3. MD.7b.- Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

3. MD.7d.- Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

3. MD.8. - Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhi8biting rectangles with the same perimeter and different areas or with the same area and different perimeters.

3.G.1. - Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:

- Mathematical operations are used in solving problems in which a new value is produced from one or more values.
- Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions.
- Understanding place value can lead to number sense and efficient strategies for computing with numbers.
- Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers.
- Measurement processes are used in everyday life to describe and quantify the world.
- Data displays describe and represent data in alternative ways.
- Geometric attitudes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.

Enduring Understandings:

- In what ways can operations affect numbers?
- How can different strategies be helpful when solving a problem?
- How does a digit's position affect its value?
- Why express quantities, measurements, and number relationships in different ways?
- Why does "what" we measure influence "how" we measure?
- Why display data in different ways?
- How does geometry better describe objects?

Knowledge, Skills, and Instructional Objectives:
•3.1 Discuss the need for standard units of measure and create a unit of length and measure with it
•3.2 Measure line segments to nearest inch, 1/2 inch, 1/4 inch, centimeter, 1/2 centimeter, and millimeter
•3.3 Review US customary and metric units of length and estimate and measure lengths to nearest inch and centimeter
•3.4 Review polygons and the concept of perimeter
•3.5 Collect, tabulate, and interpret experimental data
•3.6 Make rectangles with given perimeters, relate tiling to area, and construct triangles using given lengths and find their perimeters
•3.7 Develop the concept of area, demonstrate the measure of area by using 1-foot and 1-yard squares, and find areas by counting squares
•3.8 Develop the concept of area by measuring with identical squares and demonstrate how to calculate the area of rectangles using number models
•3.9 Relate circumference and diameter through the *about 3 times* rule
•3.10 Assess children's progress on mathematical content through the end of Unit 3

Suggested Vocabulary:
Polygon
Tiling
Area
Circumference
diameter

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Extension Strategies/Activities:
Create polygons with straws (estimate and measure perimeter and area)

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Suggested Assessments:
•Journal 1 p55, Teacher Observation
•Journal 1 p58, Home Link
•Journal 1 p60 & 61, Home Link
•Journal 1 p63, Home Link
•Home Link, Teacher Observation
•Home Link, Journal 1 p67-70

•Journal 1 p72, Home Link •Journal 1 p74, Home Link •Home Link, Teacher Observation •Progress Check 3

Theme/Unit: **Unit 4 Multiplication and Division**	**Suggested Sequence: 14 Days**

NJSLS:

3.0A.1. - Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe and/or represent a context in which a total number of objects can be expressed as 5 x 7.*

3.0A.2. - Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe and/or represent a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.*

3.0A.3.- Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.0A.4. - Determine the unknown whole number in a multiplication or division equation relating three

3.0A.5. - Apply properties of operations as strategies to multiply and divide. *Examples: If 6 X 4 = 24 is known, then 4 X 6 = 24 is also known. (Commutative property of multiplication.) 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.) Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) = (8 x 2) = 40 + 16 = 56 (Distributive property.)*

3.0A.6. - Understand division as an unknown-factor problem. *For example, find 32÷8 by finding the number that makes 32 when multiplied by 8.*

3.0A.7. - Fluently multiply and divide within 100, using strategies such as the relationship between multiplication. and division (e.g., knowing that 8 x 5 = 40, one knows 40÷5=8) or properties of operations. By the end of grade 3, know from memory all products of two one-digit numbers

3.0A.9.- Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 nines a number is always even, and explain why 4 times a number can be decomposed into two equal addends.

3.NBT.2.-Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

3.MD.3 - Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

3.MD.6.- Measure areas by counting unit squares (square cm, square m, square in, square fit, and non-standard units).

3.MD.7a.-Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.

3.MD.7b- Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

3.MD.7d.-Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-. overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems

3.MD.8.- Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhi8biting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.

Measurement is a tool to quantify a variety of phenomena.

Algebra provides language through which we communicate the patterns in mathematics.

Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values. • Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions. • Understanding place value can lead to number sense and efficient strategies for computing with numbers. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways.	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • How does a digit's position affect its value? • Why does "what" we measure influence "how" we measure? • Why display data in different ways?

Knowledge, Skills, and Instructional Objectives:
•4.1 Review multiplication and equal groups, solve and write number stories involving equal groups
•4.2 Use arrays, multiplication/division diagrams, and number models to represent and solve multiplication number stories
•4.3 Review division as equal sharing and equal grouping
•4.4 Provide opportunities to model division number stories with arrays, multiplication/division diagrams, and number models
•4.5 Discuss multiplication facts and the importance of fact power and review fact shortcuts
•4.6 Review fact families and the Multiplication/Division Facts Table, practice multiplication and division facts
•4.7 Practice multiplication facts
•4.8 Estimate the number of dots in an array, solve a problem involving factors of whole numbers, practice multiplication facts
•4.9 Introduce the use of a map scale to estimate distances
•4.10 Develop intuition about equally likely events
•4.11 Assess children's progress on mathematical content through the end of Unit 4

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Arrays Map scales	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being.

	CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

4.1 Multiples of Equal Groups
- Reviewing Multiplication/Division Diagrams
- Solving Number Stories and Equal Groups of Objects

4.2 Multiplication Arrays
- Solving Multiplication Number Stories about Arrays
- Representing Multiplication Situations with Arrays

4.3 Equal Shares and Equal Groups
- Solving Equal-Sharing Division Numbers Stories with Counters
- Playing Division Arrays

4.4 Division Ties to Multiplication
- Using Number Models and Diagrams for Division Stories
- Solving Multiplication and Division Number Stories
- Playing Division Arrays

4.5 Multiplication Fact Power and Shortcuts
- Reviewing Shortcuts for Multiplication Facts
- Finding a Benefit of Fact Power

4.6 The Multiplication/Division Facts Table and Fact Families
- Discussing the Multiplication/Division Facts Table
- Multiplication/Division Fact Triangles

4.7 Baseball Multiplication
- Introducing and playing Baseball Multiplication
- Practicing with multiplication/division Fact Triangles

4.8 Exploring Arrays and Facts
- Estimating a Number of Dots
- Arranging Chairs
- Practicing Multiplication and Division Facts with a “Fact Platter”

4.9 Estimating Distances with a Map Scale
- Introducing Map Scales
- Estimating Distances on the Classroom Map of the United States

Estimating Mileage of a US Map

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Create map scales Multiplication/division stories for classmates to solve	

Suggested Assessments:

•Slates, Journal 1 p79, Home Link
•Journal 1 p81 & 82, Home Link
•Slates, Journal 1 p84, Division Arrays Game-Teacher Observation
•Slates, Journal 1 p86, Division Arrays Game, Home Link
•Home Link, Beat the Calculator Game-Teacher Observation
•Slates, Teacher Observation, Beat the Calculator Game, Home Link

•Slates, Home Link, Teacher Observation-Baseball Multiplication Game •Journal 1 p92 & 93, Home Link •Journal 1 p95 & 96, Home Link •Journal 1 p98, Teacher Observation, Home Link •Progress Check 4

Theme/Unit: **Unit 5 Place Value in Whole Numbers and Decimals**	**Suggested Sequence: 19 Days**

NJSLS:

3.0A.3.- Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.0A.7.- Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one knows 40÷5=8) or properties of operations. By the end of grade 3, know from memory all products of two one-digit numbers.

3.NF.1 - Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.

3.MD.1 - Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g. by representing the problem on a number line diagram.

3.MD.3 - Draw a scaled picture graph and a scaled bar graph to represent a set of date with several categories. Solve one- and two- step "how many more" and "how many less" programs using information presented in a scaled bar graph.

3.MD.4 - Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scaled is marked off in appropriate units – whole numbers, halves, and quarters.

3.MD.7d- Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

3.MD.8.- Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhi8biting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values. • Algebraic thinking involves choosing, combining,	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • How does a digit's position affect its value?

and applying effective strategies for answering quantitative questions. • Understanding place value can lead to number sense and efficient strategies for computing with numbers. • Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways.	• Why express quantities, measurements, and number relationships in different ways? • Why does "what" we measure influence "how" we measure? • Why display data in different ways?

Knowledge, Skills, and Instructional Objectives:
•5.1 Review place value through ten-thousands
•5.2 Practice reading, writing, comparing, and ordering numbers less than 100,000
•5.3 Extend place value to the millions and read and write numbers through millions
•5.4 Read, write and compare large numbers and express relationships as differences and ratios
•5.5 Develop a sense of very large numbers
•5.6 Count base-10 blocks, identify polygons, and compare perimeters and areas
•5.7 Model decimals with base-10 blocks and to review decimals with money
•5.8 Model tenths and hundredths with base-10 blocks and exchanges between tenths and hundredths
•5.9 Demonstrate the use of decimal notation for metric measures and the conversion of centimeters to meters
•5.10 Introduce thousandths by revisiting millimeters and provide opportunities to interpret data from a map
•5.11 Practice decimal place value to thousandths
•5.12 Analyze data from the sunrise-sunset routine and demonstrate how to make and read a line graph
•5.13 Assess children's progress on mathematical content through the end of Unit 5

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Ten-thousand Tenths Hundredths Decimal notation	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

5.1 Place Value Through Ten-Thousands
- Reviewing place value
- Solving problems involving place value

5.2 Reading, Writing, and Ordering Numbers
- Reading and Comparing Numbers
- Playing Number Top-It (5-Digit Numbers)

5.3 Place Value to Millions
- Discussing place value though millions
- Reading/writing numbers in the millions
- Playing Number Top-It with numbers though millions

5.4 Application: the US Census
- Reading 6- and 7- digit numbers
- Comparing population of Cities

5.5 Very Large Numbers
- Calculating Age in Minutes

5.6 Exploring Base-10 Blocks, Polygons, Perimeter, and Area
- Finding the Value of Base-10 Blocks
- Identifying Squares, Rectangles, and Triangles
- Finding Perimeters, Areas, and Shapes of Polygons

5.7 Decimals with Base-10 Blocks
- Using Base-10 Blocks to Review Tenths/Hundredths
- Comparing and Ordering Decimals on a Square Grid

5.8 Tenths and Hundredths
- Exploring Place Value for 1- and 2-Place Decimals
- Making up and solving place-value problems for decimals

5.9 Tenths and Hundredths of a Meter
- Exploring the Relationships Among Metric Units, Using Decimals
- Expressing and Comparing Metric Measurements in Decimal Notation

5.10 Application: Rainfall
- Introducing 3-Place Decimals
- Converting among Centimeters, Milimeters, and Meters
- Plotting and comparing data

5.11 Place Value in Decimals
- Place-Value Tool Routines
- Practicing Decimal Place-Value Skills

Extension Strategies/Activities:
Plot rain data from a weather source for your town and compare with students from another town, state, or country

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Suggested Assessments:
•Math Masters p119, Journal 1 p102
•Number Top-It Game-Teacher Observation, Home Link
•Slates, Home Link, Number Top-It Game
•Exit Slip, Teacher Observation, Journal 1 p106, Home Link
•Number Top-It Game, Journal 1 p108, Home Link
•Journal 1 p110-112, Teacher Observation
•Journal 1 p114 & 115, Math Masters p138
•Math Masters p141, Home Link, Journal 1 p117, Base 10 Decimal Exchange Game

•Journal 1 p119, Home Link, Teacher Observation
•Journal 1 p121, Number Top-It Game with Decimals, Home Link
•Journal 1 p123, Teacher Observation, Home Link
•Exit Slip, Math Masters p159
•Progress Check 5

Theme/Unit: **Unit 6 Geometry**	**Suggested Sequence: 15 Days**

NJSLS:

3.0A.3.- Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the. unknown number to represent the problem

3.0A.5. - Apply properties of operations as strategies to multiply and divide. *Examples: If 6 X 4 = 24 is known, then 4 X 6 = 24 is also known. (Commutative property of multiplication.) 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.) Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) = (8 x 2) = 40 + 16 = 56 (Distributive property.)*

3.0A.7.- Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one knows 40÷5=8) or properties of operations. By the end of grade 3, know from memory all products of two one-digit numbers.

3.MD.7d- Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

3.MD.8 - Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the. same perimeter and different areas or with the same area and different perimeters

3.G.1. - Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values. • Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways. • Geometric attitudes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • Why does "what" we measure influence "how" we measure? • Why display data in different ways? • How does geometry better describe objects?

Knowledge, Skills, and Instructional Objectives:
•6.1 Review line segments and introduce rays and lines
•6.2 Model and draw polygons, parallel and intersecting line segments, rays, and lines
•6.3 Use angles to record turns (rotations)
•6.4 Explore various types of triangles
•6.5 Explore various types of quadrangles
•6.6 Review characteristics of polygons, emphasizing regular polygons
•6.7 Draw angles as records of rotations
•6.8 Measure angles
•6.9 Review symmetry and explore properties of symmetric shapes
•6.10 Explore concept of congruence, draw line segments, and practice naming decimals
•6.11 Review 3-dimensional shapes and identify bases of pyramids and prisms
•6.12 Explore the characteristics of prisms
•6.13 Assess children's progress on mathematical content through the end of Unit 6

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Symmetry Congruence base	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
6.1 Investigating Line Segments, Rays, and Lines
- Reviewing Line Segments
- Introducing Rays
- Introducing Lines
- Drawing Line Segments, Rays, and Lines

6.2 Parallel and Intersecting Line Segments, Rays, and Lines
- Modeling geometric figures
- Going on a Geometry Hunt

6.3 Angles and Turns
- Performing Turn Calisthenics
- Showing turns with two connected straws

6.4 Triangles

- Naming Triangles
- Constructing Triangles with Straws
- Measuring the sides of a triangle

6.5 Quadrangles
- Discussing how Quadrangles are named
- Constructing Quadrangles

6.6 Polygons
- Using straws and twist-ties to construct polygons
- Discussing characteristics of Polygons

6.7 Drawing Angles
- Making angles with connected straws
- Drawing angles to record rotations

6.8 Measuring Angles
- Introducing the Degree as a Unit of Measure for Turns
- Making and using an Angle Measurer

6.9 Symmetry
- Exploring Properties of Symmetric Figures
- Completing Symmetric Figures

6.10 Exploring Congruence, Counting, and Decimals
- Building Shapes out of Pattern Blocks
- Creating and 8-Point Design
- Designing Base-10 Block Decimals

6.11 Polyhedrons, Part 1
- Constructing a Square Pyramid and a Triangular Prism
- Discussing the Characteristics of the Pyramid and Prism

6.12 Polyhedrons, Part 2
- Identifying the Bases of a Rectangular Prism
- Constructing Pattern-Block Prisms and Tracing their Faces
- Discussing the Shapes of the Faces of Prisms

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Create polyhedrons for a polyhedron museum	

Suggested Assessments:
•Teacher Observation, Journal 1 p128, Home Link
•Journal 1 p130, Home Link, Teacher Observation
•Teacher Observation, Journal 1 p132, Home Link
•Home Link, Teacher Observation, Journal 1 p134
•Journal 1 p136, Home Link, Teacher Observation
•Journal 1 p139, Home Link
•Journal 1 p141, Teacher Observation
•Journal 1 p144, Teacher Observation, Home Link
•Journal 1 p146, Angle Race Game-Teacher Observation, Math Masters p185
•Home Link, Journal 1 p149, Math Masters p188, 190, 193
•Math Masters p194 & 195, Home Link, Teacher Observation
•Home Link, Journal 1 p153
•Progress Check 6

Theme/Unit: **Unit 7 Patterns in Products**	**Suggested Sequence: 13 Days**

NJSLS:

3.0A.2 - Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe and/or represent a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.*

3.0A.3.- Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the. unknown number to represent the problem

3.0A.4 - Determine the unknown whole number in a multiplication or division equation relating three

3.0A.5.- Apply properties of operations as strategies to multiply and divide. *Examples: If 6 X 4 = 24 is known, then 4 X 6 = 24 is also known. (Commutative property of multiplication.) 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.) Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) = (8 x 2) = 40 + 16 = 56 (Distributive property.)*

3.0A.6. - Understand division as an unknown-factor problem. *For example, find 32÷8 by finding the number that makes 32 when multiplied by 8.*

3.0A.7.- Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one knows 40÷5=8) or properties of operations. By the end of grade 3, know from memory all products of two one-digit numbers.

3.0A.8. - Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

3.0A.9. - Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example/)* observe that 4 nines a number is always even, and explain why 4 times a number can be decomposed into two equal addends.

3 NBT.1.-Use place value understanding to round whole numbers to the nearest 10 or 100.

3.NBT.2.-Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties . of operations, and/or the relationship between addition and subtraction

3.NBT.3. -Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80 , 5 x 60) using strategies based on place value and properties of operations.

3.MD.3 - Draw a scaled picture graph and a scaled bar graph to represent a set of date with several categories. Solve one- and two- step "how many more" and "how many less" programs using information presented in a scaled bar graph.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values. • Algebraic thinking involves choosing, combining, and applying effective strategies for answering	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • How does a digit's position affect its value? • Why does "what" we measure influence "how" we

quantitative questions. • Understanding place value can lead to number sense and efficient strategies for computing with numbers. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways.	measure? • Why display data in different ways?

Knowledge, Skills, and Instructional Objectives:
•7.1 Review square-number facts, multiplication and division patterns
•7.2 Determine which multiplication facts that the children still need to learn
•7.3 Practice multiplication and division facts
•7.4 Introduce parentheses in number models
•7.5 Express numbers as sums of products using number models that contain parentheses
•7.6 Multiply 1-digit numbers by multiples of 10, 100, and 1000 and divide such multiples by 1 digit numbers
•7.7 Determine when an estimate is appropriate and practice making estimates
•7.8 Multiply multiples of 10 by multiples of 10
•7.9 Explore similar polygons, solve ratio problems, and explore geometric configurations
•7.10 Assess children's progress on mathematical content through the end of Unit 7

Suggested Vocabulary: Parentheses	**Technology/21st Century/Cross-curricular Connections:** **Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
7.1 Patterns in Products
- Finding patterns in the multiplication/division facts table
- Exploring multiplication patterns

7.2 Multiplication Facts Survey

- Administering a Facts Test
- Practicing multiplication/division facts with fact triangles

7.3 Fact Power
- Play Multiplication Bingo
- Solving Multiplication and division facts

7.4 Number Models with Parentheses
- Comparing the use of punctuation marks in word sentences to parentheses in number models
- Writing number models with parentheses

7.5 Scoring in Basketball: An Application
- Finding different ways to score 10 points in basketball

7.6 Extended Facts: Multiplication and Division
- Multiplying 1-digit numbers by multiples of 10, 100, and 1,000
- Dividing multiples of 10, 100, and 1,000 by 1-digit numbers

7.7 Estimating Costs
- Review the meaning of estimation
- Solving problems by estimation

7.8 Extended Facts: Products of Tens
- Introducing and finding products of multiples of 10

7.9 Exploring Rations of Geometric Figures
- Exploring Similar Polygons
- Exploring Ration Problems
- Solving a Geometry Problem

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
find different ways to score 10 runs in a base ball game	

Suggested Assessments:
•Journal 2 p157, Home Link, Teacher Observation, Name That Number Game
•Slate Home Link, Teacher Observation of Fact Triangle Practice
•Slates Multiplication Bingo Game, Journal 2 p162
•Journal 2 p164, Home Link
•Journal 2 p166 & 167, Exit slip, Home Link
•Journal 2 p169, Home Link, Teacher Observation
•Home Link, Teacher Observation, Math Masters p223, Exit Slip
•Journal 2 p173, Home Link, Play Baseball Multiplication with Tens
•Math Masters p228-230, Teacher Observation
•Progress Check 7

Theme/Unit: **Unit 8 - Fractions**	**Suggested Sequence: 13 Days**

NJSLS:

3.0A.3.- Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.0A.5.- Apply properties of operations as strategies to multiply and divide. *Examples: If 6 X 4 = 24 is known, then 4 X 6 = 24 is also known. (Commutative property of multiplication.) 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.) Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) = (8 x 2) = 40 + 16 = 56 (Distributive property.)*

3.NF.1 - Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.

3.NF.2.- Understand a fraction as a number on the number line; represent fractions on a number line diagram.

3.NF.2a.-Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number1/b on the number line

3.NF.2b.-Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.

3.NF.3.- Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

3.NF.3a.-Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.

3.NF.3b.- Recognize and generate simple equivalent fractions, e.g., 1/2=2/4, 4/6=2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.

3.NF.3c.- Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3=3/1; recognize that 6/1=6; locate 4/4 and 1 at the same point of a number line diagram.*

3.NF.3d.- Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. . Record the results of comparisons with the symbols >, =, or ,, and justify the conclusions, e.g., by using a visual fraction model

3. MD.4 - Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot where the horizontal scale is marked off in appropriate units – whole numbers, halves, or quarters.

3.G.2. - Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.*

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values.	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem?

• Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions. • Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways. • Geometric attitudes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.	• Why express quantities, measurements, and number relationships in different ways? • Why does "what" we measure influence "how" we measure? • Why display data in different ways? • How does geometry better describe objects?

Knowledge, Skills, and Instructional Objectives:
•8.1 Use fractions to name a of b equal parts
•8.2 Make predictions based on outcomes and construct situations that meet given conditions
•8.3 Explore fractional relationships, spatial relationships, and combinations
•8.4 Introduce the number line as a model for fractions
•8.5 Find equivalent fractions
•8.6 Compare fractions using region models
•8.7 Name quantities greater that 1 with fractions and mixed numbers
•8.8 Solve number stories involving fractions
•8.9 Assess children's progress on mathematical content through the end of Unit 8

Suggested Vocabulary: Fractional relationships Spatial relationships combinations	**Technology/21st Century/Cross-curricular Connections:** **Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

8.1 Naming Parts with Fractions
- Reviewing fractions as names for parts of regions and sets
- Using fractions to name parts of regions and sets

8.2 Exploring Fractions, Re-Forming Squares, and Combinations
- Finding Relationships among Shapes
- Taking Apart and Putting Together Squares
- Dressing for the Party

8.3 Number-Line Posters for Fractions
- Making a number line poster for fractions
- Reviewing fraction concepts

8.4 Equivalent Fractions
- Using fraction cards to review and extend fraction concepts
- Investigating Equivalent Fractions
- Playing the Equivalent Fractions Game

8.5 Comparing Fractions
- Comparing fractions to ½, 0 and 1
- Playing Fraction Top-It
- Coloring equivalent fractions

8.6 Fractions Greater than One
- Naming fractional parts that are more than one
- Naming collections of fractional parts with fractions and mixed numbers
- Playing Equivalent Fractions Game

8.7 Fractions in Number Stories
- Writing and solving fraction number stories

Playing Fraction Top-It

Extension Strategies/Activities:
Measure objects to the nearest fraction, identify areas and perimeters of lengths and widths with mixed numbers

Modification Strategies/Activities: see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Suggested Assessments:
- Journal 2 p180 & 181, Slates, Home Link
- Journal 2 p183, Play the Block-Drawing Game, Home Link
- Journal 2 p185-189, Home Link
- Home Link, Journal 2 p191
- Journal 2 p194, Equivalent Fractions Game, Home Link
- Teacher Observation, Fraction Top-It Game, Home Link
- Math Masters p436, Journal 2 p197 & 198, Teacher Observation, Home Link
- Slates, Teacher Observation, Journal 2 p200 & 201, Home Link
- Progress Check 8

Theme/Unit: **Unit 9 Multiplication and Division**	**Suggested Sequence: 18 Days**

NJSLS:

3.0A.1. - Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe and/or represent a context in which a total number of objects can be expressed as 5 x 7.*

3.0A.2. - Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe and/or represnt a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.*

3.0A.3.- Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.0A.5. - Apply properties of operations as strategies to multiply and divide. *Examples: If 6 X 4 = 24 is known, then 4 X 6 = 24 is also known. (Commutative property of multiplication.) 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.) Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) = (8 x 2) = 40 + 16 = 56 (Distributive property.)*

3.0A.6. - Understand division as an unknown-factor problem. *For example, find 32÷8 by finding the number that makes 32 when multiplied by 8.*

3.0A.7. - Fluently multiply and divide within 100, using strategies such as the relationship between multiplication. and division (e.g., knowing that 8 x 5 = 40, one knows 40÷5=8) or properties of operations. By the end of grade 3, know from memory all products of two one-digit numbers

3.0A.8. - Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

3.NBT.1.-Use place value understanding to round whole numbers to the nearest 10 or 100.

3.NBT.3.-Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80 , 5 x 60) using strategies based on place value and properties of operations

3.NF.3d.- Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or ,, and justify the conclusions, e.g., by using a visual fraction model.

3.MD.2.- Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

3.MD.4. - Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot where the horizontal scale is marked off in appropriate units – whole numbers, halves, or quarters.

3.MD.5a.-A square with size length 1 unit, called “a unit square”, is said to have “one square unit” of area, and can be used to measure area.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.

Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.

Measurement is a tool to quantify a variety of phenomena.

Algebra provides language through which we communicate the patterns in mathematics.

Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions..

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values. • Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions. • Understanding place value can lead to number sense and efficient strategies for computing with numbers. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways.	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • How does a digit's position affect its value? • Why does "what" we measure influence "how" we measure? • Why display data in different ways?

Knowledge, Skills, and Instructional Objectives:
•9.1 Multiply and divide with multiples of 10, 100, and 1000
•9.2 Use mental math to multiply 1digit numbers by multi-digit numbers
•9.3 Model multiplication with base-10 blocks, explore area relationships, and find fractions of fractions
•9.4 Multiply 1-digit numbers by multi-digit numbers using a partial products algorithm
•9.5 Multiply using mental math and the partial-products algorithm
•9.6 Identify whole-number factors of whole numbers
•9.7 Share whole-dollar amounts equally
•9.8 Explore computational strategies for division and interpret remainders
•9.9 Introduce the lattice method of multiplication
•9.10 Explore 2-digit multiplication, number patterns, and the rigidity of triangles
•9.11 Extend partial-products method to products of 2-digit numbers and 2 digit-multiples of 10
•9.12 Extend partial products algorithm to products of any two 2-digit numbers
•9.13 Investigate positive and negative numbers
•9.14 Assess children's progress on mathematical content through the end of Unit 9

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Partial products algorithm Remainders rigidity	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies.

	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

9.1 Multiply and Divide with Multiples of 10, 100, and 1,000
- Modeling how to solve multiplication and division number stories
- Writing and solving number stories with multiples of 10, 100, and 1,000
- Finding products and quotients involving multiples of 10, 100, and 1,000

9.2 Use Mental Math to Multiply
- Multiplying 1-digit numbers times multi-digit numbers mentally
- Practice mental math strategies

9.3 Exploring Arrays, Areas, and Fractions
- Modeling Multiplication with Base-10 Blocks
- Finding Geoboard Areas
- Finding Fractions of Fractions of Regions

9.4 A Multiplication Algorithm
- Using an Algorithm to multiply 1-digit numbers by multi-digit numbers

9.5 Buying at the Stock-Up Sale
- Solving problems using mental math and the partial-products algorithm
- Solving Stock Up Sale Stories

9.6 Factors of Whole Numbers
- Identifying and finding factors of a number
- Introducing Factor Bingo

9.7 Sharing Money
- Sharing play money equally
- Solving division problems

9.8 Broken Calculator Division
- Exploring computational strategies for division
- Solving division number stories with remainders

9.9 Lattice Multiplication
- Exploring and practicing the lattice method of multiplication

9.10 Exploring Arrays, Equilateral Triangles, and Strength of Paper
- Modeling multiplication with Arrays and Base-10 Blocks
- Finding Number Patterns by Filling Equilateral Triangles
- Building Bridges and Testing Their Strength

9.11 Products of 2-Digit Numbers, Part 1
- Extending the partial-products algorithm to 2-digit number times 2-digit multiples of 10
- Using the partial-products algorithm to find products of 2-digit numbers and 2-digit multiples of 10

9.12Products of 2-Digit Numbers, Part 2
- Finding products of 2-digit numbers

9.13 Positive and Negative Numbers
- Practicing writing temperatures above and below zero
- Using “sea level” as a zero point
- Expressing changes from a beginning point with positive and negative numbers

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Write a step by step guide for completing a lattice multiplication exercise	

Suggested Assessments:

- Journal 2 p206, Teacher Observation, Play Name That Number Game
- Journal 2 p208, Teacher Observation, Home Link
- Journal 2 p214, Home Link
- Journal 2 p217, Teacher Observation, Home Link
- Play Factor Bingo Game, Home Link, Teacher Observation
- Journal 2 p222, Teacher Observation, Home Link
- Journal 2 p224, Teacher Observation, Home Link
- Journal 2 p226 & 227, Home Link
- Journal 2 p229 &230, Math Masters p 298 & 300, Home Link, Teacher Observation
- Journal 2 p233, Home Link
- Journal 2 p235, Home Link
- Journal 2 p237, Home Link, Teacher Observation
- Progress Check 9

Theme/Unit: **Unit 10 Measurement and Data**	**Suggested Sequence: 10 days**

NJSLS:

3.0A.7. - Fluently multiply and divide within 100, using strategies such as the relationship between multiplication. and division (e.g., knowing that 8 x 5 = 40, one knows 40÷5=8) or properties of operations. By the end of grade 3, know from memory all products of two one-digit numbers

3.0A.8. - Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

3.NF.2.- Understand a fraction as a number on the number line; represent fractions on a number line diagram.

3.NF.3a.- Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.

3.NF.3b.- Recognize and generate simple equivalent fractions, e.g., 1/2=2/4, 4/6=2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.

3.NF.3d.- Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or ,, and justify the conclusions, e.g., by using a visual fraction model.

3.MD.2.- Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

3 MD.3. - Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

3.MD.4. - Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot where the horizontal scale is marked off in appropriate units – whole numbers, halves, or quarters.

3.MD.7d.- Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values. • Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions. • Fractions and decimals allow for quantities to be expressed with greater precision than with just	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • Why express quantities, measurements, and number relationships in different ways? • Why does "what" we measure influence "how" we measure? • Why display data in different ways?

whole numbers. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways.	

Knowledge, Skills, and Instructional Objectives:
•10.1 Review units, tools, and measuring length in US customary and metric systems
•10.2 Explore the volume of rectangular prisms
•10.3 Review metric and US customary units of weight, examine different kinds of scales, and read weights on scales
•10.4 Order objects by volume, build rectangular prisms having the same volume but different dimensions, and measure weight using various kinds of scales
•10.5 Explore the concept of capacity and demonstrate equivalencies between measures of capacity
•10.6 Introduce the mean of a set of data and review the median of a set of data
•10.7 Calculate the mean of a set of data and review the median of a set of data
•10.8 Introduce the memory keys on a calculator
•10.9 Make frequency tables and find the mean, median, and mode of data sets
•10.10 Introduce plotting coordinates on coordinate grids
•10.11 Assess children's progress on mathematical content through the end of Unit 10

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Customary units of weight Mean Median	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
10.1 Review: Length
- Discussing tools used to measure distances
- Renaming measurements
- Practicing measurement skills

10.2 Volume
- Introducing the volume of a rectangular prism

10.3 Exploring Volume

- Finding Rectangular Prisms of a Given Volume

10.4 Weight
- Estimating various kinds of scales
- Listing objects that can be weighed with various scales

10.5 Weight and Volume
- Ordering four objects by weight
- Ordering four objects by volume

10.6 Capacity
- Discussing information on labels of food containers

10.7 The Mean and Median
- Finding the mean number of children
- Finding the mean of ostrich egg clutches
- Finding the median of sets of data

10.8 Calculating the Mean
- Finding the Mean and Median arm span of the class
- Finding the Mean and Median Heights and Arm Spans
- Practicing how to find the Mean

10.9 Calculator Memory
- Adding to and subtracting from numbers stored in memory
- Playing Memory Addition/Subtraction
- Practicing using the memory keys on the calculator

10.10 Frequency Distributions
- Making a frequency table of waist-to-floor measurements
- Finding the Median and Mean of the Set of Data
- Finding the Mode of the Set of Data

10.11 Coordinate Grids
- Introducing Ordered Pairs as a Means of Locating Points
- Plotting points on a coordinate grid

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Make a frequency table of heights, calculate the median, mean, and mode of the set of data	

Suggested Assessments:

•Journal 2 p240, Teacher Observation, Math Masters p319
•Journal 2 p244, Home Link
•Journal 2 p246 & 247, 241
•Math Masters p333, 335, Teacher Observation
•Journal 2 p250, Home Link, Slates
•Journal 2 p253 & 254, Home Link, Math Masters p341
•Exit Slip, Journal 2 p256, Home Link
•Memory Addition and Subtraction Game, Journal 2 p258
•Journal 2 p261, Home Link
•Journal 2 p264, Home Link, Math Masters p354
•Progress Check 10

Theme/Unit: **Unit 11 Probability; End-of-Year Review**	**Suggested Sequence: 7 Days**

NJSLS:

3.0A.7. - Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one knows 40÷5=8) or properties of operations. By the end of grade 3, know from memory all products of two one-digit numbers.

3.NF.3.- Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

3.MD.1- Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g. by representing the problem on a number line diagram

3.MD.3.-Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics**.**
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:

- Mathematical operations are used in solving problems in which a new value is produced from one or more values.
- Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions.
- Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers.
- Measurement processes are used in everyday life to describe and quantify the world.
- Data displays describe and represent data in alternative ways.

Enduring Understandings:

- In what ways can operations affect numbers?
- How can different strategies be helpful when solving a problem?
- Why express quantities, measurements, and number relationships in different ways?
- Why does "what" we measure influence "how" we measure?
- Why display data in different ways?

Knowledge, Skills, and Instructional Objectives:

•11.1 Read and interpret line and bar graphs
•11.2 Organize, graph, and interpret data
•11.3 Collect and interpret data from spinner experiments with outcomes that are equally likely and not equally likely
•11.4 Represent the likelihood of outcomes with visual models
•11.5 Organize and analyze survey data, predict outcomes, and estimate the make-up of populations of people and objects
•11.6 Assess children's progress on mathematical content through the end of unit 11

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
outcomes certain uncertain	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

11.1 The Language of Chance Events
- Introducing Words and Phrases Associated with Chance Events
- Making Lists of Certain and Uncertain Events

11.2 A Pattern-Block Toss Experiment
- Performing a Pattern-Block Toss Experiment
- Discussing the Experimental Results

11.3 A Coin-Toss Experiment
- Conducting and Analyzing a Coin-Toss Experiment

11.4 Spinner Experiments
- Demonstrating How To Make and Use a Spinner
- Conducting “Equally Likely” and “Not Equally Likely” Spinner Experiments

11.5 Designing Spinners
- Designing Spinners to Match Given Descriptions

11.6 Blocks-in-a-Bag Experiment
- Predicting the Contents of a Bag by performing a random-draw experiment
- Solving problems involving chance outcomes

11.7 Using Data to Predict Outcomes
- Organizing and Analyzing Survey Data on Hand Preference
- Predict the Number of Left-Handed Teachers at your school
- Solving Random-Draw Problems

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Predict lunch selections of the students in the classroom and in the grade level, compare predictions with actual results	

Suggested Assessments:
•Journal 2 p279 & 280, Teacher Observation
•Journal 2 p176, Teacher Observation
•Journal 2 p269, Teacher Observation, Math Masters p369 & 370
•Journal 2 p272 & 273, Play Spin To Win, Home Link
•Exit Slip, Journal 2 p 275, Home Link

Fourth Grade

Theme/Unit: **Unit 1: Naming and Constructing Geometric Figures**	**Suggested Sequence: 15 Days**

NJSLS:

4.MD.5 – Recognize angles as geometric shapes that are formed whenever two rays share a common endpoint, and understand concepts of angle measurement .

4.G.1 – Draw points, lines, line segments, rays, angles (acute, right, obtuse), and perpendicular and parallel lines.

4.G.2 – Classify two-dimensional figures based on the presence or absence of angles of a specified size. . Recognize right triangles as a category, and identify right triangles

Big Ideas:

Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena. Measurement is a tool to quantify a variety of phenomena.

Essential Questions:	**Enduring Understandings:**
• Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways. • Geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.	• Why does "what" we measure influence "how" we measure/ • Why display data in different ways? • How does geometry better describe objects?

Knowledge, Skills, and Instructional Objectives:

•1.1 Acquaint students with content and organization of the *Student Reference Book*
•1.2 Introduce tools for geometry, review points, line segments, lines and rays
•1.3 Guide students in construction of angles, triangles, quadrangles, in the classification of quadrangles
•1.4 Model the classification of quadrangles based on their properties
•1.5 Provide opportunities to identify properties of polygons and distinguish between convex and non-convex polygons; and to explore geometric definitions and classification
•1.6 Provide practice using a compass
•1.7 Guide students in defining a circle; provide opportunities to explore designs with circles
•1.8 Guide students construction of figures with a compass and straightedge
•1.9 Assess student progress on mathematical content through the end of Unit 1

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Convex Non-convex	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills.

	CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

1.1 Introduction to the Student Reference Book
- Investigating and using the SRB

1.2 Points, Line Segments, Lines, and Rays
- Reviewing and drawing points, line segments, lines, and rays

1.3 Angles, Triangles, and Quadrangles
- Constructing angles, triangles, and quadrangles

1.4 Parallelograms
- Explore properties of parallelograms

1.5 Polygons
- Construct convex and concave polygons out of straws
- Define properties of polygons

1.6 Drawing Circles with a Compass
- Draw circles with a compass
- Construct an inscribed square

Extension Strategies/Activities: Create a museum of constructed polygons	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Suggested Assessments:

•Slates, Math Journal 1 p2 and 3
•Slates, Math Journal 1 p4 and 5, Study Link, Addition Top- It Game- Teacher Observation
•Math Journal 1 p 6, 7, 8, Study Link
•Math Journal 1 p 10 and 11, Study Link, Subtraction Top-It Game- Teacher Observation
•Math Journal 1 p12 and 13, Study Link
•Slates, Math Journal 1 p17, 18, 19, Study Link
•Math Journal 1 p 21-25, Study Link
•Progress Check 1

Theme/Unit: **Unit 2**	**Suggested Sequence: 13 days**

NJSLS:

4.OA.1 – Interpret a multiplication equation as a comparison, e.g. interpret 35 = 5*7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations .

4.OA.3 – Solve multistep word problems posed with whole numbers and having whole number answers using four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

4.OA.5 – Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "add 3" and starting with the number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between. odd and even numbers. Explain informally why the numbers will continue to alternate this way

4.NBT.1 – Recognize that in a multi-digit whole number, a digit in the one place represents then times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.

4.NBT.2 – Read and write multi-digit whole numbers using base-10 numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digit in each place, using >, =, < symbols to record the results of comparisons.

4.MD.1 – Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; oz, lb; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is equal to 12 times as long as 1 inch. Express the length of a 4ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24).

4.MD.2 – Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

4.MD.4 – Make a line plot to display a data set of measurement in fractions of a unit (½, ¼, ⅛). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For . example, from a line plot find and interpret the difference in length between the longest and the shortest specimens in an insect collection

4.G.2 – Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.

Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.

Measurement is a tool to quantify a variety of phenomena.

Algebra provides language through which we communicate the patterns in mathematics.

Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Probability quantifies the likelihood that something will happen and enables us to make predictions and informed decisions.

Essential Questions:

- Mathematical operations are used in solving problems in which a new value is produced from one or more values.
- Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions.
- Understanding place value can lead to number sense and efficient strategies for computing with numbers.
- Measurement processes are used in everyday life to describe and quantify the world.
- Data displays describe and represent data in alternative ways.
- Geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.

Enduring Understandings:

- In what ways can operations affect numbers?
- How can different strategies be helpful when solving a problem?
- How does digit's position affect its value?
- Why does "what" we measure influence "how" we measure?
- Why display data in different ways?
- How does geometry better describe objects?

Knowledge, Skills, and Instructional Objectives:

•2.1 Review examples of various ways in which numbers are used; introduce the World Tour Project
•2.2 Review equivalent names for whole numbers and name collection boxes
•2.3 Provide practice identifying values of digits in numbers up to one billion; provide practice reading and writing numbers up to one billion
•2.4 Provide practice with place-value skills using a calculator routine; review reading and writing large numbers
•2.5 Provide practice organizing and displaying data with a tally chart and determining the maximum, minimum, range, and mode of a set of data
•2.6 Review how to display a set of data with a line plot; review how to find the median of a set of data
•2.7 Review partial-sums algorithm used to solve multi-digit addition problems; to introduce a column addition method similar to the traditional addition algorithm
•2.8 Provide practice measuring length to the nearest half-centimeter; guide the construction and use of bar graphs for a set of collected data
•2.9 Review the trade-first counting up methods, introduce the partial differences method of solving multi-digit subtraction problems; provide practice estimating differences for multi-digit subtraction problems
•2.10 Assess students' progress on mathematical contents through to the end of Unit

Suggested Vocabulary:

Maximum
Minimum
Range
mode

Technology/21st Century/Cross-curricular Connections:

Technology:

8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

	Career Ready Practices: CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
Read "How Much Is a Million?"; How to Spend 1 Million Dollars project; Calculator games;
2.1 A Visit to Washington D.C
- Examine numerical data about Washington D.C

2.2. Many Names for Numbers
- Name a target number using numbers 1-20 and their operations

2.3 Place Value in Whole Numbers
- Review place value for whole numbers
- Write numbers as sums of ones, tens, and hundreds

2.4 Place Value with a Calculator
- Solve riddles involving place value
- Play High-Number Toss

2.5 Organizing and Displaying Data
- Collect, organize, and interpret a set of data
- Determine how many raisins are in a typical ½ ounce box

2.6 The Median
- Find landmarks in data
- Construct line plots
- Analyze data and find the median

2.7 Addition of Multi-digit Numbers
- Practice partial sums method for addition

2.8 Displaying Data with a Bar Graph
- Determine the median head size of the class

2.9 Subtraction of Multi-digit Numbers
Practice trade-first method for subtraction

Extension Strategies/Activities: Develop a plan for saving, spending, and investing money	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Suggested Assessments:
•Slates, Math Journal 1 p28, Study Link
•Slates, Math Journal 1 p30, Name that Number Game, Study Link
•Math Journal 1 p32-34, Study Link
•Math Journal 1 p36, Study Link, Playing Fishing for Digits
•Slates, Math Journal 1 p38, Addition Top-It, Study Link
•Slates, Subtraction Top-It, Study Link
•Slates, Math Journal 1 p42,43
High Number Toss Game, Study Link

•Slates, Math Journal 1 p46-48, Study Link •Slates, Math Journal 1 p49-50, Subtraction Target Practice ,Study Link •Progress Check 2

Theme/Unit: **Unit 3**	**Suggested Sequence: 15 Days**

NJSLS:

4.OA.1 – Interpret a multiplication equation as a comparison, e.g. interpret 35 = 5*7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations

4.OA.2 – Multiply or divide to solve word problems involving multiplicative comparison, e.g. by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison form additive comparison.

4.OA.3 – Solve multistep word problems posed with whole numbers and having whole number answers using four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

4.OA.4 – Find all factor pairs for a whole number in the range of 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range of 1-100 is a prime or composite.

4.NBT.2 – Read and write multi-digit whole numbers using base-10 numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digit in each place, using >, =, < symbols to record the results of comparisons.

4.NBT.6 – Find whole number quotients and remainders with up to four digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or models.

4.MD.2 – Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

4.G.2 – Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.

Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.

Measurement is a tool to quantify a variety of phenomena.

Algebra provides language through which we communicate the patterns in mathematics.

Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Probability quantifies the likelihood that something will happen and enables us to make predictions and informed decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values. • Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions. • Understanding place value can lead to number sense and efficient strategies for computing with numbers. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways. • Geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • How does a digit's position affect its value? • Why does "what we measure influence "how" we measure? • Why display data in different ways? • How does geometry better describe objects?

Knowledge, Skills, and Instructional Objectives:

•3.1 Review "What's My Rule?" problems
•3.2 Review strategies for solving multiplication facts and to help students work toward instant recall of multiplication facts
•3.3 Establish a 50 facts test routines; provide practice with multiplication facts
•3.4 Give 50 facts test and record results; provide practice with multiplication
•3.5 Guide exploration of the relationship between multiplication and division; provide practice with division facts
•3.6 Provide practice interpreting data through World Tour Project
•3.7 Provide practice measuring length and using a map scale
•3.8 Introduce a simplified approach to solving number stories; to provide practice solving number stories
•3.9 Review the meanings of number sentences; provide practice determining whether number sentences are true or false
•3.10 Review the use of parentheses in number sentences
•3.11 Introduce vocabulary and notation for open sentences; provide practice solving open sentences
•3.12 Assess students' progress on mathematical content through the end of Unit 3

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Parentheses Open sentences	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies.

	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

- Multiplication Posters (keep beside bed to study every night); Fact Triangles; Number stories using "Halloween" time

3.1 Multiplication Facts

- Review multiplication shortcuts
- Play fact triangle sort

3.2 Multiplication Facts Practice

- Finding patterns in the 9s, 5s, and other multiplication facts
- Play multiplication baseball

3.3 More Multiplication Facts Practice

- Play multiplication baseball

3.4 Multiplication, Division, and Fractions

- Explore relationships between multiplication and division
- Practice division facts with Fact Triangles
- Play division arrays

3.6 Finding Air Distances

- Find the air distance between two cities
- Write and solve numbers stories about air distances

3.7 A Guide for Solving Number Stories

- Solve number stories about air distances
- Review situation diagrams

3.8 True or False Number Sentences

- Determine whether a number sentence is true or false

3.9 Parentheses in Number Sentences

- Determine whether number sentences containing parentheses are true or false
- Use parentheses in number sentences
- Note parallels between commas and parentheses

3.10 Open sentences

- Explore the meaning of open sentences
- Find the solutions of number sentences
- Solve broken calculator games

3.11 Logic problems

- Using logic grids to solve problems
- Creating logic puzzles

Extension Strategies/Activities: Create logic puzzles to exchange with peers	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Suggested Assessments:

•Slates, Math Journal 1 p53-54, Study Link
•Slates, Math Journal 1 p16, Study Link, play Name that Number, Math Masters p489
•Math Journal 1 p58, 50 Facts Test 1, Baseball Multiplication, Study Link
•Math Masters p81, 50 Facts Test 2, Math Masters p414 & 416, Study Link
•Slates, Math Journal 1 p61, Study Link

•Math Journal 1 p171-175, Study Link, Multiplication Top-It
•Polygon Pair up, Study Link
•Slates, Math Journal 1 p66-67, Study Link, play High Number Toss
•Math Journal 1 p69, Study Link, 50 Facts Test
•Slates, Math Journal 1 p71, Study Link, play Name that Number
•Slates, Broken Calculator Activity, Math Journal 1 p73-75, Study Link
•Progress Check 3

Theme/Unit: **Unit 4**	**Suggested Sequence: 19 Days**

NJSLS:

4.OA.2 – Multiply or divide to solve word problems involving multiplicative comparison, e.g. by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison form additive comparison

4.NBT.1 – Recognize that in a multi-digit whole number, a digit in the one place represents then times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of. place value and division

4.NF.6 – Use decimal notation for fractions with denominators of 10 or 100. For example, rewrite 0.62 and 62/100, describe a length as 0.96 meters, locate 0.62 on a number line diagram.

4.NF.7 – Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when two decimals refer to the same whole. Record the results of comparisons with the symbols, >, =, <, and justify the conclusions, e.g. by using a visual model.

4.MD.1 – Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; oz, lb; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is equal to 12 times as long as 1 inch. Express the length of a 4ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24).

4.MD.2 – Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

4.G.2 – Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values • Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions. • Understanding place value can lead to number sense and efficient strategies for computing with numbers. • Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers. • Measurement processes are used in everyday	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • How does a digit's position affect its value? • Why express quantities, measurements, and number relationships in different ways? • Why does "what we measure influence "how" we measure? • Why display data in different ways? • How does geometry better describe objects?

life to describe and quantify the world. • Data displays describe and represent data in alternative ways. • Geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.	

Knowledge, Skills, and Instructional Objectives:
•4.1 Extend the base-ten place value system to decimal
•4.2 Review basic concepts and notation for decimals through hundredth
•4.3 Guide students as they compare and order decimals in tenths and hundredth
•4.4 Explain why decimals are useful; and to guide estimation of sums and differences of decimals
•4.5 Extend methods for whole-number addition and subtraction to decimals
•4.6 Provide practice adding and subtracting decimals to compute balances in a savings account
•4.7 Extend basic concepts and notation for decimals through thousandths
•4.8 Review the relationships among metric units of length; and to guide students as they work with metric measurements
•4.9 Assist students as they establish personal references for metric units of length.
•4.10 Guide students as they measure lengths to nearest millimeter; and to provide practice converting measurements between millimeters and centimeters
•4.11 Assess students' progress on mathematical content through the end of unit 4

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Conversions Metric measurements notation	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity. 9.2.4.D.1 Determine various ways to save.

Recommended Instructional Activities:
Students create own deposit/withdraw slip from Bank; Understanding Millipedes & Centipede bugs (show pictures); Measuring themselves and partner; Move around school to measure objects

4.1 Decimals

- Model decimals with base-10 blocks
- Review reading tenths and hundredths

4.2 Comparing and Ordering Decimals
- Order decimals
- Write decimal riddles

4.3 Estimating with Decimals
- Discuss why decimals are useful
- Estimate decimal sums

4.4 Decimal Addition and Subtraction
- Add and subtract decimals using an algorithm
- Represent decimals on a grid

4.5 Decimals in Money
- Practice maintaining a bank account
- Practice addition and subtraction of decimals

4.6 Thousandths
- Model decimals with base-10 blocks
- Practice using tenths, hundredths, thousandths

4.7 Metric Units of Study
- Review metric units of linear measures
- Practice conversions among metric units

4.8 Personal references for Metric Length
- Find personal references for metric units of length
- Practice estimating length

4.9 Measuring Millimeters
- Measure lengths in millimeters and centimeters
- Measure invertebrates in metric units

4.10 Decimal Place Value
- Review place value chart for whole numbers and extending decimals
- Practice reading and writing decimals
- Write and solve place value puzzles

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Create a book for younger students explaining how to save money	

Suggested Assessments:
•Slates, Math journal 1 p78, Math Masters p107, Study Link
•Slates, Math Journal 1 p80-81, Play Baseball Multiplication
•Slates, Math Journal 1 p83, Playing Product Pile Up
•Slates, Math Journal 1 p85, Study Link, Playing Number Top It
•Slates, Math Message, Math Journal 1 p87-88, Study Link
•Math Journal 1p90-91, Study Link
•Slates, Math Journal 1 p94, Math Masters p 125, Study Link
•Slates, Math Journal 1 p36, Study Link, Playing fishing for digits
•Math Journal 1 p98-99, Study Link, Playing Number Top It
•Slates, Math Journal 1 p102-103, Study Link
•Progress Check 4

Theme/Unit: **Unit 5**	**Suggested Sequence: 13 Days**

NJSLS:

4.OA.1 – Interpret a multiplication equation as a comparison, e.g. interpret 35 = 5*7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations

4.OA.2 – Multiply or divide to solve word problems involving multiplicative comparison, e.g. by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison form additive comparison

4.OA.3 – Solve multistep word problems posed with whole numbers and having whole number answers using four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

4.NBT.1 – Recognize that in a multi-digit whole number, a digit in the one place represents then times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.

4.NBT.2 – Read and write multi-digit whole numbers using base-10 numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digit in each place, using >, =, < symbols to record the results of comparisons.

4.NBT.3 – Use place value understanding to round multi-digit whole numbers to any place.

4.NBT.5 – Multiply a whole number of up to four digits by one-digit whole number, and multiply two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

4.MD.1 – Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; oz, lb; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is equal to 12 times as long as 1 inch. Express the length of a 4ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24).

4.MD.2 – Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

4.G.1 – Draw points, lines, line segments, rays, angles (acute, right, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures

4.G.2 – Classify two-dimensional figures based on the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.

Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.

Measurement is a tool to quantify a variety of phenomena.

Algebra provides language through which we communicate the patterns in mathematics.

Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values. • Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions. • Understanding place value can lead to number sense and efficient strategies for computing with numbers. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways. • Geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • How does a digit's position affect its value? • Why does "what" we measure influence "how" we measure? • Why display data in different ways? • How does geometry better describe objects?

Knowledge, Skills, and Instructional Objectives:
•5.1 Extend basic multiplication facts to products of ones and tens and products of tens and tens
•5.2 Provide practice with extended multiplication facts; and to introduce the basic principles of multiplication with multi digit numbers
•5.3 Provide practice deciding whether estimation is appropriate in a given situation; and to provide practice estimating sums
•5.4 Provide practice estimating whether a product is in the tens, hundreds, thousands, or more
•5.5 Review and provide practice with the partial-products algorithm for 1-digit multipliers
•5.6 Introduce and provide practice with the partial-products algorithm for 2-digit multipliers.
5.7 Review and provide practice with the lattice method for multiplication
•5.8 Provide practice reading, writing, and comparing large numbers using patterns in the base-ten place-value system
•5.9 Introduce exponential notation for powers of 10 as a way of naming the values of places in our base-ten system
•5.10 Discuss sensible ways of reporting a count when a large number of items has been counted
•5.11 Guide students as they look up and compare numerical data, including geographical measurements
•5.12 Assess students' progress on mathematical content through the end of unit 5

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Notation Algorithm Lattice method	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee.

	CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

- Multiplication Wrestling game; Find the world population;

5.1 Extend Multiplication facts

- Develop a rule for multiplying ones by tens
- Develop a rule for multiplying tens by tens
- Write and solve multiplication number stories with multiples of 10

5.2 Multiplication Wrestling

- Play multiplication wrestling
- Practice extending multiplication facts

5.3 Estimating sums

- Estimate distances and travel times when planning a trip

5.4 Estimating products

- Estimate averages
- Make predictions from data
- Round whole numbers and estimate answers

5.5 The partial-products algorithm for multiplication (one digit multipliers)

- Find products mentally
- Demonstrate partial-products algorithm for 1-digit multipliers
- Model multiplication with base-10 blocks

5.6 The partial-products algorithm for multiplication (two digit multipliers)

- Estimate products
- Extend the partial-products algorithm to 2-digit multipliers
- Model multiplication with base-10 blocks

5.7 Lattice multiplication

- Demonstrate the lattice method for 1-digit multipliers
- Demonstrate the lattice method for 2-digit multipliers
- Compare calculations speeds for partial-products and lattice methods

5.8 Big Numbers

- Practice reading and writing big numbers
- Explore relationships among a thousand, a million, and a billion
- Read and write large numbers on a calculator

5.9 Powers of 10

- Introduce exponential notation for powers of 10
- Identify other number names for powers of 10

5.10 Rounding and reporting large numbers

- Review rounding

Extension Strategies/Activities: Create a PowerPoint presentation that outlines how to do the lattice method of multiplication	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Suggested Assessments:
•Math Journal 1 p106-107, Play Beat the Calculator
•Slates, Play Multiplication Wrestling, Math Journal 1 p 109, Study Link
•Slates, Math Journal 1 p112-113, Playing Product Pile Up, Study Link
•Slates, Math Journal 1 p115, Play Multiplication Wrestling
•Slates, Math Journal 1 p117, 118, 120, Study Link
•Slates, Math Journal 1 p 122-123, Playing Name that Number, Study Link
•Math Journal 1 p124-124, Study Link, Playing Multiplication Top It
•Math Message, Math Journal 1 p126-127, Study Link
•Slates, Math Journal 1 p130, Study Link, Play Polygon Pair Up
•Slates, Math Journal 1 p132, Take 50 fact test
•Slates, Math Journal p134, Study Link, Playing Number Top It
•Progress Check 5

Theme/Unit: **Unit 6**	**Suggested Sequence: 18 Days**

NJSLS:

4.OA.2 – Multiply or divide to solve word problems involving multiplicative comparison, e.g. by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison form additive comparison

4.OA.3 – Solve multistep word problems posed with whole numbers and having whole number answers using four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

4.OA.4 – Find all factor pairs for a whole number in the range of 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range of 1-100 is a prime or composite

4.NBT.2 – Read and write multi-digit whole numbers using base-10 numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digit in each place, using >, =, < symbols to record the results of comparisons.

4.NBT.6 – Find whole number quotients and remainders with up to four digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or models

4.MD.2 – Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. . Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale

4.MD.5 – Recognize angles as geometric shapes that are formed whenever two rays share a common endpoint, and understand concepts of angle measurement:

4.MD.5a –An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a “one degree angle,” and can be used to measure angles.

4.MD.5b –An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.

4.MD.6 – Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

4.MD.7 – Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measure of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g. by using an equation with a symbol for unknown angle measure.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced	• In what ways can operations affect numbers? • How can different strategies be helpful when

from one or more values. • Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions. • Understanding place value can lead to number sense and efficient strategies for computing with numbers. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways. • Geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.	solving a problem? • How does a digit's position affect its value? • Why does "what" we measure influence "how" we measure? • Why display data in different ways? • How does geometry better describe object

Knowledge, Skills, and Instructional Objectives:

•6.1 Provide practice solving multiplication and division number stories by using diagrams to organize information
•6.2 Guide the exploration of a variety of strategies to solve equal grouping division number stories
•6.3 Introduce and provide practice with a "low-stress" division algorithm for 1 digit divisors
•6.4 Introduce the expression of remainders as fractions or decimals; and to provide practice interpreting remainders for division problems
•6.5 Review rotations; and to guide students as they make and use a full circle protractor
•6.6 Provide practice using a full circle protractor to measure and draw angles less than 360 degrees
•6.7 Guide students as they classify angles as acute, right, obtuse, straight, and reflex; and to provide practice using a half circle protractor to measure and draw angles
•6.8 Guide students in the use of letter –number pairs and ordered pairs of numbers to locate points on a grid; to provide practice using a map scale
•6.9 Introduce latitude and longitude; to provide practice finding the latitude and longitude of places on a globe and a map; identify places given latitude and longitude
•6.10 Provide practice with a "low stress" division algorithm for 2 digit divisors
•6.11 Assess students' progress on mathematical content through the end of Unit 6

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Expression Rotations reflex	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in

	solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

- Candy project (cutting apart licorice) to interpret remainders; Create their own park by gridding

6.1 A Multiples Strategy for Division

- Demonstrate and practice multiples of 10 strategy for division
- Find products and quotients involving multiples of 10, 100, 1000

6.2 The Partial-Quotients Division Algorithm

- Introduce and use the Partial-Quotients algorithm
- Find products and quotients involving multiples of 10, 100, 1000
- Play Division Dash

6.3 Multiplication and Division Number Stories

- Solve multiplication and division number stories
- Use counters to solve equal sharing problems

6.4 Expressing and Interpreting Remainders

- Express remainders as fractions
- Interpret remainders in problem contexts
- Create and solve multiplication and division number stories

6.5 Rectangular Coordinate Grids for Maps

- Use ordered pairs to locate points on a map
- Estimate distances on a map

6.6 Rotations and Angles

- Express the relationship between rotations and degree measures
- Form angles given measures
- Measure elapsed time in degrees

6.7 Using a Circular Protractor

- Demonstrate angles and rotations
- Use an angle measurer
- Draw and compare angles

6.8 Half-Circle Protractor

- Introduce the half-circle protractor and measure angles using it
- Measure angles in triangles
- Model angles using rope

6.9 The Global Grid System

- Study a world globe
- Make a model of a world globe

6.10 Latitude and Longitude

- Introduce latitude and longitude
- Locate places on world and regional maps

Extension Strategies/Activities: Create latitude and longitude riddles or classmates to solve	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Suggested Assessments:

•Slates, Math Journal 1 p138-140, Study Link, play Division Arrays
•Slates, Math Journal 1 p142 and 143, Study Link, play High Number Toss
•Slates, Math Journal 1 p144-146, Study Link

•Slates, Math Journal 1 p148-149, Study Link
•Slates, Math Journal 1 p153-154, Study Link
•Slates, Math Journal 1 p155, play Division Dash, Study Link
•Slates, Math Journal 1 p157-158, Study Link
•Math Journal 1 p161-163, play Angle Tangle, Study Link
•Math Journal 1p164, play Over and Up Squares, Study Link
•Slates, Math Journal 1 p 166-167, 50 Facts Test, Study Link
•Progress Check 6

Theme/Unit: **Unit 7**	**Suggested Sequence: 21 days**

NJSLS:

4.OA.4 – Find all factor pairs for a whole number in the range of 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range of 1-100 is a prime or composite

4.NF.1 – Explain why fraction a/b is equivalent to a fraction (n*a)/(n*b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

4.NF.2 – Compare two fractions with different numerators and different denominators, e.g. by creating common denominators or numerators, or by comparing to a benchmark fraction such as ½. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results with symbols >, <, =, and justify the conclusions, e.g. by using a visual fraction model.

4.NF.3 – Understand a fraction a/b with a>1 as a sum of fractions 1/b.

4.NF.3a – Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

4.NF.3b – Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g. by using a visual fraction model. Examples: ⅜=⅛+⅛+⅛.

4.NF.3c – Add and subtract mixed numbers with like denominators, e.g. by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.

4.NF.3d – Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g. by using visual fraction models and equations to represent the problem.

4.NF.4c – Solve word problems involving multiplication of a fraction by a whole number, e.g. by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?

4.NF.5 – Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express 3/10 as 30/100.

4.NF.6 – Use decimal notation for fractions with denominators of 10 or 100. For example, rewrite 0.62 and 62/100, describe a length as 0.96 meters, locate 0.62 on a number line diagram.

4.MD.2 – Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. . Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale

4.MD.4 – Make a line plot to display a data set of measurement in fractions of a unit (½, ¼, ⅛). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and the
. shortest specimens in an insect collection

4.MD.6 – Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

4.MD.7 – Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measure of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g. by using an equation with a symbol for unknown angle measure.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.

Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics**.**
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.
Probability quantifies the likelihood that something will happen and enables us to make predictions and informed decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values. • Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions. • Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways.	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • Why express quantities, measurements, and number relationships in different ways? • Why does "what" we measure influence "how" we measure? • Why display data in different ways?

Knowledge, Skills, and Instructional Objectives:
•7.1 Review fractions as parts of a whole (ONE), fractions on number lines, and uses of fractions
•7.2 Provide practice finding fractional parts of set
•7.3 Review basic vocabulary and concepts of probability; to introduce finding probabilities for events when all the possible outcomes are equally likely
7.4 Guide students as they find fractional parts of polygonal regions
7.5 Guide students in the use of pattern blocks to add and subtract fractions
7.6 Provide practice identifying equivalent fractions
7.7 Guide the development and use of a rule for generating equivalent fractions
7.8 Provide experience renaming fractions as decimals and decimals as fractions; to develop an understanding of the relationship between fractions and division
7.9 Provide practice ordering sets of fractions
7.10 Guide students as they find the whole, or the ONE, for given fractions
7.11 Review basic ideas of probability, including fairness and expected results; and to guide the application of fractions to spinners
7.12 Guide students in comparing predicted and actual results from an experiment with equally likely outcomes
7.13 Assess students' progress on mathematical content through the end of Unit 7

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Regions Probability Ordering fractions Outcomes	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee.

	CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

- Read "Apple Fractions", actually dissect apple into fractions; could be done with pizza or cake etc.; Make spinners for probability

7.1 Review of Basic Fraction Concepts

- Identify fraction parts of pattern-block shapes
- Identify fractional parts of a number line
- Divide shapes into equal parts

7.2 Fractions of Sets

- Model "fraction of "problems with pennies
- Solve "fraction of" problems
- Write and solve "fraction of" number stories

7.3 Pattern-Block Fractions

- Explore fractional parts of regions with pattern blocks
- Explore tangrams

7.4 Fraction Addition and Subtraction

- Model fraction sums with pattern blocks
- Model fraction differences with pattern blocks
- Solve fraction addition and subtraction problems

7.5 Clock Fractions

- Represent fractions on a clock face
- Model fraction addition and subtraction on a clock face

7.6 Many Names for Fractions

- Start a collection of fraction names
- Identify pictorial representations of fractions

7.7 Equivalent Fractions

- Develop a rule for finding equivalent fractions
- Solve "fraction-of" problems

7.8 Fractions and Decimals

- Rename fractions as decimals and decimals as fractions

7.9 Comparing Fractions

- Order fractions
- Compare fractions with ½
- Use digits to create fractions
- Solve fraction problems

7.10 The ONE for Fractions

- Use pattern blocks and counters to find the ONE
- Solve "What is the ONE?" problems
- Play Fraction Top-It
- Name fractional parts of a region

7.11 Probability, Fractions, and Spinners

- Do spinner experiments
- Judge the likelihood of events

7.12 A Cube-Drop Experiment

- Predict the results of an experiment
- Perform a cube drop experiment

Compare actual and expected results

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Create a menu of foods served in fractions	

Suggested Assessments:

•Slates, Math Journal 2 p185-187, play Product Pile up, Study Link
•Slates, Math Journal 2 p189-190, Study Link
•Slates, Math Journal 2 p192, Study Link, play Fraction Of
•Slates, Math Journal 2 p194-196, Study Link
•Slates, Math Journal 2 p198, Study Link
•Slates, Math Journal 2 p343-344, play Grab Bag, Study Link
•Slates, Math Journal 2 p342-343, Study Link
•Slates, Math Journal 2 p203, Study Link, 50 Facts Test
•Slates, Math Journal 2 p 205-206, play Over and Up Squares, Study Link
•Slates, Math Journal 2 p 208-209, Study Link
•Slates, Math Journal 2 p 211, play Chances Are, Study Link
•Slates, Math Journal 2 p 213-214, Study Links
•Progress Check 7

Theme/Unit: **Unit 8**	**Suggested Sequence: 14 days**

NJSLS:

4.OA.1 – Interpret a multiplication equation as a comparison, e.g. interpret 35 = 5*7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations

4.OA.2 – Multiply or divide to solve word problems involving multiplicative comparison, e.g. by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison form additive comparison

4.OA.3 – Solve multistep word problems posed with whole numbers and having whole number answers using four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

4.NF.1 – Explain why fraction a/b is equivalent to a fraction (n*a)/(n*b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

4.NF.3c – Add and subtract mixed numbers with like denominators, e.g. by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. .

4.NF.4 – Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

4.NF.4a – Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 4/5 as the product 5*(1/4), recording the conclusion by the equation 5/4=5*(1/4).

4.NF.6 – Use decimal notation for fractions with denominators of 10 or 100. For example, rewrite 0.62 and 62/100, describe a length as 0.96 meters, locate 0.62 on a number line diagram.

4.MD.1 – Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; oz, lb; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is equal to 12 times as long as 1 inch. Express the length of a 4ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24).

4.MD.2 – Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

4.MD.3 – Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.

4.MD.4 – Make a line plot to display a data set of measurement in fractions of a unit (½, ¼, ⅛). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and the shortest specimens in an insect collection
.

4.MD.7 – Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measure of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g. by using an equation with a symbol for unknown angle measure.

4.G.1 – Draw points, lines, line segments, rays, angles (acute, right, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.

Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.

Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values. • Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions. • Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways. • Geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • Why express quantities, measurements, and number relationships in different ways? • Why does "what" we measure influence "how" we measure? • Why display data in different ways? • How does geometry better describe objects?

Knowledge, Skills, and Instructional Objectives:
•8.1 Provide experience measuring and adding distances; finding the median and other landmarks of a set or measurements; and finding the perimeters of triangles
•8.2 Provide practice measuring distance to the nearest foot; and to provide experience creating a scale drawing on a grid using measurements and a given scale
•8.3 Review basic area concepts; to provide practice estimating the area of a polygon by counting unit squares and using a scale drawing to find area
•8.4 Demonstrate how to estimate the area of a surface having a curved boundary; and to provide practice converting from one square unit to another
•8.5 Guide to development and use of a formula for the area of a rectangle
•8.6 Review the properties of parallelograms; and to guide the development and use of a formula for the area of a parallelogram
•8.7 Guide the development and use of a formula for the area of a triangle
•8.8 Discuss how geographical areas are measured; and to provide practice using division to compare two quantities with like units
•8.9 Assess students' progress on mathematical content through the end of unit 8

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Scale drawing Unit squares Formula Geographical areas	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:**

	CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

- Scale drawings of their rooms, classrooms, or house;

8.1 Kitchen Layouts and Perimeter

- Rating the efficiency of a kitchen
- Analyzing kitchen arrangements
- Sketch work triangles of given perimeters
- Investigate perimeters on a geo board

8.2 Scale Drawings

- Make a rough floor plan for the classroom
- Make scale drawings

8.3 Area

- Estimate areas of polygons by counting squares
- Estimate the areas of the classroom floor
- Investigate geo board areas

8.4 What is the Ares of My Skin?

- Estimate the areas of your skin
- Share results of estimations and convert estimates to square feet
- Estimate areas of irregular regions

8.5 Formula for the Area of a Rectangle

- Develop and use a formula for the area of a rectangle

8.6 Formula for the Area of a Parallelogram

- Review properties of parallelograms
- Develop and use a formula for finding the area of a parallelogram
- Solve area problems
- Build a fence

8.7 Formula for the Area of a Triangle

- Develop and use a formula for finding the area of a triangle
- Solve area problems
- Compare areas

8.8 Geographical Area Measurements

- Compare county areas
- Find areas

Extension Strategies/Activities: Create a scale drawing of your living room	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Suggested Assessments:
•Slates, Math Journal 2 p219-222, Study Link

•Slates, Math Journal 2 p224-225, Take 50 Fact test, Study Link •Slates, Math Journal 2 p227, play Fraction Top-It, Study Link •Slates, Math Journal 2 p230, Study Link •Slates, Math Journal 2 p232-234, Study Link •Slates, Math Journal 2 p236-238, Play Fraction of, Study Link •Slates, Math Journal 2 p240-242, Study Link •Slates, Math Journal 2 p245, Study Link, Play Grab Bag •Progress Check 8

Theme/Unit: **Unit 9**	**Suggested Sequence: 12 days**

NJSLS:

4.OA.3 – Solve multistep word problems posed with whole numbers and having whole number answers using four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

4.NBT.5 – Multiply a whole number of up to four digits by one-digit whole number, and multiply two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

4.NBT.6 – Find whole number quotients and remainders with up to four digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or models.

4.NF.1 – Explain why fraction a/b is equivalent to a fraction (n*a)/(n*b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

4.NF.2 – Compare two fractions with different numerators and different denominators, e.g. by creating common denominators or numerators, or by comparing to a benchmark fraction such as ½. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results with symbols >, <, =, and justify the conclusions, e.g. by using a visual fraction model.

4.NF.4a – Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 4/5 as the product 5*(1/4), recording the conclusion by the equation 5/4=5*(1/4).

4.NF.4b. - Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 x (2/5) as 6 x (1/5), recognizing this product as 6/5. [In general, n x (a/b) = (n x a)/b].*

4.NF.4c – Solve word problems involving multiplication of a fraction by a whole number, e.g. by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?

4.NF.5 – Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express 3/10 as 30/100.

4.NF.6 – Use decimal notation for fractions with denominators of 10 or 100. For example, rewrite 0.62 and 62/100, describe a length as 0.96 meters, locate 0.62 on a number line diagram.

4.MD.2 – Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. . Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale

4.MD.3 – Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values. • Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions. • Understanding place value can lead to number sense and efficient strategies for computing with numbers. • Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways.	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • How does a digit's position affect its value? • Why express quantities, measurements, and number relationships in different ways? • Why does "what" we measure influence "how" we measure? • Why display data in different ways?

Knowledge, Skills, and Instructional Objectives:

•9.1 Guide the use of percents in describing real life situations; to reinforce naming equivalencies among fractions, decimals, and percents
•9.2 Reinforce renaming fourths, fifths, and tenths as decimals and percents; introduce solving percent problems by using equivalent fractions
•9.3 Introduce renaming any fraction as a decimal by using a calculator, to reinforce fraction/percent equivalencies for fourths, fifths, and tenths
•9.4 Reinforce renaming fractions as percents using a calculator; to introduce solving number stories involving discounts expressed as percents
•9.5 Reinforce the use of data table; reinforce renaming fractions as percents using a calculator and renaming decimals as percents
•9.6 Guide the operation and tabulation of survey data; to introduce the use of percents to compare quantities expressed as fractions with unlike denominators
•9.7 Provide practice ranking and comparing data that are reported as percents and displaying ranked data by coloring maps
•9.8 Introduce multiplication of decimals by whole numbers; to reinforce the partial –products and lattice methods for multiplication
•9.9 Introduce division of decimals by whole number; to reinforce the partial quotients division algorithm
•9.10 Assess students' progress on mathematical content through the end of Unit 9

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Percent Equivalencies Partial quotients	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee.

	CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

- Make their own survey and then graph it;

9.1 Fractions, Decimals, and Percents

- Make equivalent names for percents
- Write and solve "Percent-of" number stories

9.2 Converting "Easy" Fractions to Decimals and Percents

- Find equivalent names for other "easy" fractions
- Memorize equivalent names for "easy" fractions

9.3 Using a Calculator to Convert Fractions to Decimals

- Use a calculator to convert fractions to decimals
- Play Fraction/Percent Concentration
- Find fraction, decimal, and percent equivalencies

9.4 Using a Calculator to Convert Fractions to Percents

- Solve number stories involving discounts
- Play Fraction/Percent Concentration
- Estimate what percent of a circle graph is shaded

9.5 Conversions among Fractions, Decimals, and Percents

- Complete an equivalent names for fractions table
- Use a calculator to rename fractions as percents

9.6 Comparing the Results of a Survey

- Make predictions based on individual survey data
- Tabulate and analyze survey results for the whole class
- Graph survey results

9.7 Comparing Population Data

- Discuss a table of population data
- Rank and display population data
- Interpret maps

9.8 Multiplication of Decimals

- Estimate products of a decimal
- Multiple decimals
- Use the lattice method to position decimal points

9.9 Division of Decimals

- Estimate quotients of decimals
- Divide decimals

Extension Strategies/Activities: Write and solve number stories with decimals (exchange with classmates)	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Suggested Assessments:
•Slates, Math Journal 2 p248-250, Study link, play Fraction Match
•Slates, Math Journal 2 p 252-253, play Rugs and Fences, Study Link
•Slates, play Fraction/Percent Concentration, Study Link
•Slates, Math Journal 2 p 256-258, Study Link
•Slates, Math Journal 2 p 342-343, Study Link
•Slates, Math Journal 2 p 261, Take 50 Facts Test, Study Link
•Slates, Math Journal 2 p264-265, Study Link
•Slates, Math Journal 2 p 268-269, play Over and Up Squares, Study Link
•Progress Check 9

Theme/Unit: **Unit 10**	**Suggested Sequence: 10 days**

NJSLS:
4.OA.5 – Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "add 3" and starting with the number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate this way.
4.NF.5 – Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express 3/10 as 30/100.
4.NF.6 – Use decimal notation for fractions with denominators of 10 or 100. For example, rewrite 0.62 and 62/100, describe a length as 0.96 meters, locate 0.62 on a number line diagram.
4.MD.1 – Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; oz, lb; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is equal to 12 times as long as 1 inch. Express the length of a 4ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24).
4.MD.6 – Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
4.G.1 – Draw points, lines, line segments, rays, angles (acute, right, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures
4.G.2 – Classify two-dimensional figures based on the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
4.G.3. - Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Big Ideas:
Numeric reasoning involves fluency and facility with numbers.
Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values. • Algebraic thinking involves choosing, combining, and applying effective strategies for	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • Why express quantities, measurements, and number relationships in different ways?

answering quantitative questions. • Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways. • Geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.	• Why does "what" we measure influence "how" we measure? • Why display data in different ways? • How does geometry better describe objects

Knowledge, Skills, and Instructional Objectives:
•10.1 Guide the exploration of reflections of 2 dimensional figures
•10.2 Guide the exploration of reflections; provide practice identifying lines of reflection
•10.3 Guide the discovery of basic properties of reflections
•10.4 Guide exploration of the connection between reflections and line symmetry
•10.5 Guide the application of reflections, rotations, and translations
•10.6 Introduce addition involving negative integers
•10.7 Assess student's progress on mathematical content through the end of Unit 10

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Dimensions Reflections Rotations Translations Negative integers	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
- Create own images with reflections

10.1 Explorations with Transparent Mirror
- Use a transparent mirror to "move" shapes and reflected images
- Use the transparent mirror to draw images of shapes

10.2 Finding Lines of Reflection

- Play games that involve reflections
- Introduce the concept of reflection

10.3 Properties of Reflections

- Examine the relationships between an object and its reflected image
- Draw reflected images
- Explore reflections of 3-D figures

10.4 Line Symmetry

- Complete symmetrical pictures
- Find lines of symmetry
- Explore lines of symmetry of polygons
- Explore turn symmetry

10.5 Frieze Patterns

- Introduce frieze patterns
- Draw frieze patterns

10.6 Positive and Negative Numbers

- Use credits and debits to practice addition of positive and negative numbers
- Play the Credits/Debits game

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Identify lines of symmetry in the classroom	

Suggested Assessments:

•Slates, Math Journal 2 p 274, play Over and Up Squares, Study Link
•Slates, Math Journal 2 p 276, play Angle Tangle, Study Links
•Slates, Math Journal 2 p 309-310, Study Links
•Slates, Math Journal 2 p 279, 311, 312, 313, 314, Study Links
•Slates, Math Journal 2 p 281-282, play Polygon Pair Up
•Slates, Math Journal 2 p 283, Study Links
•Progress Check 10

Theme/Unit: **Unit 11**	**Suggested Sequence: 15 days**

NJSLS:

4.NF.4a – Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 4/5 as the product 5*(1/4), recording the conclusion by the equation 5/4=5*(1/4).

4.NF.4b.- Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 x (2/5) as 6 x (1/5), recognizing this product as 6/5. [In general, n x (a/b) = (n x a)/b].*

4.NF.4c – Solve word problems involving multiplication of a fraction by a whole number, e.g. by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?

4.MD.1 – Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; oz, lb; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit interms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is equal to 12 times as long as 1 inch. Express the length of a 4ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24).

4.MD.2 – Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

4.MD.3 – Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.

4.MD.4 – Make a line plot to display a data set of measurement in fractions of a unit (½, ¼, ⅛). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and the shortest specimens in an insect collection.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers. • Measurement processes are used in everyday life to describe and quantify the world. • Data displays describe and represent data in alternative ways.	• Why express quantities, measurements, and number relationships in different ways? • Why does “what” we measure influence “how” we measure? • Why display data in different ways?

Knowledge, Skills, and Instructional Objectives:

•11.1 Review grams and ounces as units of weight; to guide the estimation and measurement of weight in grams and ounces
•11.2 Review the properties of common geometric solids
•11.3 Provide practice identifying geometric given their properties; to guide the construction of polyhedrons

•11.4 Review concepts and units of volume
•11.5 Guide the development and use of a formula for finding the volume of a rectangular prism
•11.6 Review addition of positive and negative integers; to introduce subtraction of positive and negative integers
•11.7 Review customary units of capacity
•11.8 Assess students' progress on mathematical content through the end of Unit 1

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Polyhedrons Grams Ounces	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

11.1 Weight
- Set up a gram and ounce museum
- Estimate weights
- Convert between metric and customary weights
- Play "What's My Weight?"

11.2 Geometric Solids
- Review vocabulary for geometric solids
- Model geometric solids and compare them

11.3 Constructing Geometric Solids
- Solve geometric riddles
- Use straws and twist-ties to model polyhedrons

11.4 A Volume Exploration
- Use cubes to find the volume of a rectangular prism

11.5 A Formula for the Volume of Rectangular Prisms
- Solve cube stacking problems
- Derive a formula for the volume of a rectangular prism
- Find the volume of given prisms
- Explore volume by building prisms

11.6 Subtraction of Positive and Negative Numbers
- Use credits and debits to practice subtraction of positive and negative numbers
- Play Credits/Debits Game

11.7 Capacity and Weight

- Find the weight of cup of rice
- Solve problems involving units of weight and capacity

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Create riddles involving attributes of objects including size, shape, and weight	

Suggested Assessments:

•Slates, Math Journal 2 p 286-287, Study Link
•Slates, Math Journal 2 p 289-291, Study Link
•Slates, Math Journal 2 p 293-295, Take 50 Facts Quiz, Study Link
•Slates, play Credits/Debits Game, Study Link
•Slates, Math Journal 2 p298, 300-302, play Chances Are, Study Link
•Slates, Math Journal 2 p 303, Study Link
•Slates, Math Journal 2 p305-306, Study Link
•Progress Check 11

Theme/Unit: **Unit 12**	**Suggested Sequence: 8 days**

NJSLS:

4.OA.3 – Solve multistep word problems posed with whole numbers and having whole number answers using four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

4.OA.4 – Find all factor pairs for a whole number in the range of 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range of 1-100 . is a prime or composite 4.NBT.3 – Use place value understanding to round multi-digit whole numbers to any place.

4.NF.2 **– Co**mpare two fractions with different numerators and different denominators, e.g. by creating common denominators or numerators, or by comparing to a benchmark fraction such as ½. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results with symbols >, <, =, and justify the conclusions, e.g. by using a visual fraction model.

4.NF.5 – Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express 3/10 as 30/100.

4.MD.1 – Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; oz, lb; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is equal to 12 times as long as 1 inch. Express the length of a 4ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24).

4.MD.2 – Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics**.**
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Mathematical operations are used in solving problems in which a new value is produced from one or more values. • Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions. • Understanding place value can lead to number sense and efficient strategies for computing with numbers. • Fractions and decimals allow for quantities to be expressed with greater precision than with just	• In what ways can operations affect numbers? • How can different strategies be helpful when solving a problem? • How does a digit's position affect its value? • Why express quantities, measurements, and number relationships in different ways? • Why does "what" we measure influence "how" we measure. • Why display data in different ways?

whole numbers. • Measurement processes are used in everyday life to describe and quantify the world • Data displays describe and represent data in alternative ways.	

Knowledge, Skills, and Instructional Objectives:
•12.1 Introduce rates; and to provide practice collecting and comparing rate data
•12.2 Provide practice using a rate table to record rate information; and to provide practice solving rate problems
•12.3 Provide practice checking the validity of data by converting the data to more accessible rates
•12.4 Introduce calculating the unit price for a product; and to provide practice comparing unit prices and identifying information needed for comparison shopping
•12.5 Provide practice calculating and comparing unit prices that involve fractions of cents
•12.6 Reflect on this year's World Tour experiences and progress on 50-facts tests
•12.7 Assess students' progress on mathematical content through the end of Unit 12

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Rates Validity Unit price	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity. 9.2.4.E.2 Identify ways interest rates add to the cost of goods and services. 9.2.4.E.4 Apply comparison shopping skills to purchasing decisions.

Recommended Instructional Activities:
12.1 Introducing Rates
- Collect and compare eye blinking data and rates
- List examples of rates
- Use multiplication and division diagrams to solve rate problems

12.2 Solving Rate Problems
- Introducing rate tables
- Solve rate problems

12.3 Converting Between Rates
- Explore methods for checking data
- Analyze data and determine if it makes sense

12.4 Comparison Shopping: Part 1
- Calculate and compare unit prices

12.5 Comparison Shopping: Part 2
- Discuss unit price labels
- Solve problems involving unit pricing
- Calculate unit prices without a calculator
- Compare prices

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Create a sales flyer listing items by unit price Make shopping lists using the sales flyer and determine the total cost of the shopping list	

Suggested Assessments:
•Slates, Math Journal 2 p312-313, Playing the Credits/Debits Game, Study Link
•Slates, Math Journal 2 p316-318, Study Link
•Slates, Math Journal 2 p319-320, Play Name That Number, Study Link
•Slates, Math Journal 2 p322, Playing Fraction Top-It, Study Link
•Slates, Math Journal 2 p324-326, 50 fact test, Study Link
•Unit 12 Progress Check

Fifth Grade

Theme/Unit: **Unit 1: Number Theory**	**Suggested Sequence: 15 Days**

NJSLS:

5.0A.2. - Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 x (8 + 7). Recognize that 3 x (18932 + 921) is three times as large as 18932 + 921without having to. calculate the indicated sum or product*

5.NBT.2.- Explain patterns in the number of zeroes of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

5.NF.5a.- Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Algebra provides language through which we communicate the patterns in mathematics**.**
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• How can we compare and contrast numbers? • What makes a computational strategy both effective and efficient? • How can we decide when to use an exact answer and when to use an estimate?	• A quantity can be represented numerically in various ways. Problem solving depends on upon choosing wise ways. • Computational fluency includes understanding the meaning and the appropriate use of numerical operations. • Context is critical when using estimation.

Knowledge, Skills, and Instructional Objectives:

•1.1 Acquaint students with the content and organization of the Journal and Reference Book
•1.2 Use multiplication number models to represent rectangular arrays
•1.3 Develop automaticity with multiplication facts
•1.4 Review divisibility concepts
•1.5 Introduce divisibility rules and use calculator to test for divisibility
•1.6 Classify whole numbers as prime or composite
•1.7 Introduce square numbers & exponent key on calculator
•1.8 Introduce concept of square root & square root key on calculator
•1.9 Review equivalency concepts for whole numbers; introduce factor strings for prime factorization
•1.10 Assess students' progress on mathematical content of number theory

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Divisibility Prime Composite	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

	Career Ready Practices: CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

1.2 Rectangular Arrays
- Review arrays
- Find all possible rectangular arrays for a number
- Make cube arrays

1.3 Factors
- Introduce the multiplication facts routine
- Review the meaning of factor, product, and factor pair

1.4 The Factor Captor Game
- Review the meaning of divisibility
- Play Factor Captor
- Use fact triangles to practice multiplication facts

1.5 Divisibility
- Use a calculator to test for divisibility by a whole number
- Introduce divisibility tests
- Explore a divisibility test by 4

1.6 Prime and Composite Numbers
- Define and classify prime and composite numbers

1.7 Square Numbers
- Investigate properties of square numbers
- Play Factor Top-It

1.8 Unsquaring Numbers
- Find the square root of numbers
- Compare numbers with their squares
- Make square number collections

1.9 Factor Strings and Prime Factorizations
- Introduce factor strings
- Find factor strings and prime factorization

Extension Strategies/Activities: Play Factor Bingo	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Suggested Assessments:
•Journal 1 p2-3
•Study Link
•Journal 1 p9 – 11

•Game – Teacher Observation
•Study Link
•Journal 1 p16
•Journal 1 p21
Study Link
•Journal 1 p23
•Math Message
Journal 1 p25-26
•Progress Check 1- Written Assessment and Open Response

Theme/Unit: **Unit 2:**	**Suggested Sequence: 17 days**

NJSLS:

5.0A.1.- Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.0A.2. - Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 x (8 + 7). Recognize that 3 x (18932 + 921) is three times as large as 18932 + 921without having to calculate the indicated sum or product.*

5.NBT.1 - Recognize that in a multi-digit number, a digit in the ones place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

5.NBT.2.- Explain patterns in the number of zeroes of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

5.NBT.3a.-Read and write decimals to thousandths using base-ten numerals, number names, and expanded. form, e.g., 347.392=3 x 100 + 4 x 10 + 7 x 1 + 3 x (1/10) + 9 x (1/100) + 2 x (1/1000)

5.NBT.3b.-Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and , symbols to record the results of comparisons.

5.NBT.4. - Use place value understanding to round decimals to any place.

5.NBT.7. - Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties or operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

5.MD.1. - Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.
Probability quantifies the likelihood that something will happen and enables us to make predictions and informed decisions.

Essential Questions:	**Enduring Understandings:**
• How can we compare and contrast numbers? • What makes a computational strategy both effective and efficient? • How can we decide when to use an exact answer and when to use an estimate?	• A quantity can be represented numerically in various ways. Problem solving depends on upon choosing wise ways. • Computational fluency includes understanding the meaning and the appropriate use of numerical operations. • Context is critical when using estimation.

Knowledge, Skills, and Instructional Objectives:

•2.1 Develop estimation strategies
•2.2 Review place value concepts & use various addition methods
•2.3 Review various subtraction methods
•2.4 Review mathematical models to solve number stories
•2.5 Use statistical landmarks to describe experimental data
•2.6 Review the vocabulary associated with probability
•2.7 Use magnitude estimates for multiplication of whole numbers or decimals

•2.8 Review various multiplication methods for whole numbers and decimals
•2.9 Review lattice method of multiplication of whole numbers and decimals
•2.10 Compare relative sizes of large numbers and use a sample to estimate
•2.11 Assess students' progress on estimation and computation

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Statistical landmarks Magnitude estimates	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

2.1 Estimation Challenge
- Introduce the estimation challenge problem
- Discuss estimation and calculation strategies

2.2 Procedures for Addition of Whole Numbers and Decimals
- Reviewing addition algorithms (column and partial sums)
- Practice addition of whole numbers and decimals

2.3 Procedures for Subtraction of Whole Numbers and Decimals
- Review subtraction algorithms
- Practice subtraction of whole numbers and decimals

2.4 Addition and Subtraction Number Stories
- Solve number stories using open sentences
- Write addition and subtraction number stories

2.5 Estimate Your Reaction Time
- Estimate mean reaction time for the class
- Review minimum, maximum, range, mode, and median (statistical landmarks)
- Estimate individual reaction times and share results
- Interpret a table of data
- Display reaction time in line plots

2.6 Chance Events
- Review probability

- Identify the statistical landmarks for a set of data
- Make predictions based on outcomes of a probability experiment

2.7 Estimate Products

- Estimate products
- Play Multiplication Bull's-Eye
- Solve number stories

2.8 Multiplication of Whole Numbers and Decimals

- Review partial-product method for whole numbers
- Introduce and practice multiplication of decimals

2.9 The Lattice Method of Multiplication

- Review the lattice method of multiplication
- Multiple whole numbers and decimals by the lattice method

2.10 Comparing Millions, Billions, and Trillions

- Use sampling to make an estimate
- Make time estimates for 1 billion and 1 trillion

Solve large number problem

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Record reaction times in a frequency table Identify the mean, median, and mode of the reaction times	

Suggested Assessments:

•Journal 1 p29-30
•Journal 1 p32-33
•Journal 1 p35
•Journal p37-38
Study Link
•Journal 1 p41
Study Link
•Study Link
•Game – Teacher Observation
•Journal 1 p50 -51
•Study Link
•Study Link
•Game – Teacher Observation
•Study Link
•Progress Check 2 - Written Assessment and Open Response

Theme/Unit: **Unit 3:**	**Suggested Sequence: 16 days**

NJSLS:

5.0A.2. - Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 x (8 + 7). Recognize that 3 x (18932 + 921) is three times as large as 18932 + 921without having to calculate the indicated sum or product.*

5.NBT.2.- Explain patterns in the number of zeroes of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

5.NBT.3a.-Read and write decimals to thousandths using base-ten numerals, number names, and expanded. form, e.g., 347.392=3 x 100 + 4 x 10 + 7 x 1 + 3 x (1/10) + 9 x (1/100) + 2 x (1/1000)

5.NBT.3b.-Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and , symbols to record the results of comparisons.

5.NBT.4. - Use place value understanding to round decimals to any place.

5.G.3. - Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*

5.G.4. - Classify two-dimensional figures in a hierarchy based on properties.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics**.**
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.
Probability quantifies the likelihood that something will happen and enables us to make predictions and informed decisions.

Essential Questions:	**Enduring Understandings:**
• How can we compare and contrast numbers? • What makes a computational strategy both effective and efficient? • How can we decide when to use an exact answer and when to use an estimate? • How can spatial relationships be described by careful use of geometric language?	• A quantity can be represented numerically in various ways. Problem solving depends on upon choosing wise ways. • Computational fluency includes understanding the meaning and the appropriate use of numerical operations. • Context is critical when using estimation. • Geometric properties can be used to construct geometric figures.

Knowledge, Skills, and Instructional Objectives:

•3.1 Explore data collection, organization, and interpretation
•3.2 Provide experiences with interpreting data
•3.3 Relate circles and relationships among angles to the degree measures of angles
•3.4 Review types of angles and geometric figures
•3.5 Review compass skills and explore angles formed by intersecting lines
•3.6 Explore triangle types
•3.7 Explore geometric properties of polygons
•3.8 Explore side and angle relationships in regular tessellations
•3.9 Find angle measurement sum for any polygon
•3.10 Review polygon attributes and vocabulary
•3.11 Assess students' progress on mathematical content of geometry concepts

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
tessellations	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

3.1 Introduction to the American Tour
- Comparing the 1790 census with the 2000 census
- Take a classroom census
- Post census results on a probability meter

3.2 American Tour: Population Estimates
- Estimate Colonial populations
- Use population tables to answer questions
- Rank states by populations

3.3 Exploring Angle Measures
- Find pattern-block angle measures
- Review ways to name angles

3.4 Using a Protractor
- Practice measuring and drawing angles

3.5 Using a Compass
- Copy line segments
- Find lengths with a compass
- Inscribing a regular hexagon in a circle

3.6 Congruent Triangles
- Copy a triangle using available tools
- Copy a triangle with a compass and straightedge

3.7 Properties of Polygons
- Sort polygons by their properties
- Play Polygon Capture
- Sort attribute blocks by properties

3.8 Regular Tessellations
- Explore tessellations

- Make tessellations with pattern blocks

3.9 Angles of Polygons

- Find the sums of angles in quadrangles, pentagons, and hexagons
- Find angle sums by dividing polygons into triangles

3.10 Solving Problems Using the Geometry Template

- Draw circles with the geometry template
- Solve geometry template challenges

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Create geometry template challenges to exchange and solve with classmates	

Suggested Assessments:

•Journal 1 p60
Study Link
•Journal 1 p62-63
•Study Link
•Journal 1 p69
Study Link
•Journal 1 p72-73
•Journal 1 p75
•Study Link
•Game – Teacher Observation
•Journal 1 p82-83
Study Link
•Journal 1 p85-89
Study Link
•Journal 1 p92-96
•Progress Check 3 - Written Assessment and Open Response

Theme/Unit: **Unit 4:**	**Suggested Sequence: 10 Days**

NJSLS:

5.0A.1.- Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.0A.2. - Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 x (8 + 7). Recognize that 3 x (18932 + 921) is three times as large as 18932 + 921without having to calculate the indicated sum or product.*

5.NBT.2.- Explain patterns in the number of zeroes of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

5.NBT.6 - Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

5.NBT.7. - Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties or operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

5.NF.5a.- Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.

5.G.3. - Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*

5.G.4. - Classify two-dimensional figures in a hierarchy based on properties.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics**.**
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• How can we compare and contrast numbers? • What makes a computational strategy both effective and efficient? • How can we decide when to use an exact answer and when to use an estimate?	• Numeric fluency includes both the understanding of and the ability to appropriately use numbers. • Computational fluency includes understanding the meaning and the appropriate use of numerical operations. • Context is critical when using estimation.

Knowledge, Skills, and Instructional Objectives:

•4.1 Review multiplication and division facts
•4.2 Introduce long division algorithm
•4.3 Develop strategies for estimating straight path distances using a map scale
•4.4 Practice strategies for the long division algorithm
•4.5 Provide experience making magnitude estimates for quotients and using the long division algorithm with decimals
•4.6 Solve division number stories and interpret remainders

•4.7 Investigate the use of variables, review a variety of mathematical skills, and explore division concepts
•4.8 Assess students' progress on division

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Algorithm Variables	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

4.1 Division Facts and Extensions
- Practicing division facts and extend division facts
- Use a mental division strategy

4.2 The Partial-Quotients Division Algorithm
- Review partial quotients division algorithm

4.3 American Tour: Finding Distances on a Map
- Use a map scale to find distances in the United States
- Estimate curved path distances
- Estimate a route length

4.4 Division of Decimal Numbers
- Make magnitude estimates for quotients
- Calculate quotients
- Model division with base ten blocks

4.5 Interpreting the Remainder
- Solve division number stories and interpret remainders
- Write division number stories and illustrate division problems

4.6 Skills Review with First to 100
- Play First to 100

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities,
Division Dash Game	

	including 504 students.

Suggested Assessments:
• Game – Teacher Observation
•Journal 1 p101
Study Link
•Journal 1 p103
Study Link
•Journal 1 p106-107
Study Link
•Journal 1 p109
Study Link
•Journal 1 p111-112
Study Link
•Game – Teacher observation
Study Link
•Progress Check 4 - Written Assessment and Open Response

Theme/Unit: **Unit 5:**	**Suggested Sequence: 19 days**

NJSLS:

5.NBT.3a.-Read and write decimals to thousandths using base-ten numerals, number names, and expanded. form, e.g., 347.392=3 x 100 + 4 x 10 + 7 x 1 + 3 x (1/10) + 9 x (1/100) + 2 x (1/1000)

5.NBT.4. - Use place value understanding to round decimals to any place.

5.NBT.7. - Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties or operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

5.NF.1 - Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. [In general, a/b + c/d = (ad + bc)/bd.]*

5.NF.2.- Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7<1/2.*

5.NF.3.- Interpret a fraction as division of the numerator by the denominator (a/b=a÷b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g. by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.

Algebra provides language through which we communicate the patterns in mathematics.

Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• How can the collection, organization, interpretation, and display of data be used to answer questions? • How do mathematical ideas interconnect and build on one another to produce a coherent whole? • How can we decide when to use an exact answer and when to use an estimate?	• The message conveyed by the data depends on how data is collected, represented, and summarized. • One representation may sometimes be more helpful than another; and, used together, multiple representations give a fuller understanding of a problem. • Context is critical when using estimation.

Knowledge, Skills, and Instructional Objectives:

•5.1 Review fraction concepts; practice parts and whole and fractional parts of whole numbers
•5.2 Review the whole; provide experience with mixed number and improper fraction concepts
•5.3 Review equivalent fractions; compare and order fractions; explore fraction addition
•5.4 Introduce multiplication and division rules for finding equivalent fractions
•5.5 Provide practice renaming fractions and decimals; review rounding decimals
•5.6 Provide experience with graphic models for renaming fractions and decimals
•5.7 Use a calculator to find decimal equivalents for fractions
•5.8 Discuss the uses of percent's; introduce using a calculator to convert decimals to percent's

•5.9 Review bar graphs; discuss properties of circle graphs
•5.10 Use Percent Circle to measure circle graph sectors
•5.11 Construct circle graphs using Percent Circles
•5.12 Extend American Tour with information about mathematics instruction and related historical problems
•5.13 Assess students' progress on fractions, decimals, and percent's

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Improper fractions	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

5.1 Fraction Review
- Review basic fraction ideas
- Solving parts-and-whole problems with fractions
- Using fractions to read a ruler or tape measure

5.2 Mixed Numbers
- Model mixed numbers with pattern blocks
- Solve pattern block puzzles

5.3 Ordering Fractions
- Compare and order fractions
- Introduce the fraction stick chart
- Add with fraction stick pieces

5.4 Two Rules for Finding Equivalent Fractions
- Formulate rules for finding equivalent fractions
- Split fraction sticks to make equivalent fractions

5.5 Fractions and Decimals: Part 1
- Rename fractions as decimals
- Round decimals

5.6 Fractions and Decimals: Part 2
- Use a fraction stick chart and decimal number line to write fractions as decimals
- Create a table of decimal equivalents for fractions

5.7 Fractions and Decimals: Part 3

- Use a calculator to convert fractions to decimals
- Find decimal equivalents for thirds, sixths, ninths
- Order and compare decimals

5.8 Using a Calculator to Convert Fractions to Percents
- Explore the meaning and purpose of percent
- Change fractions to percents

5.9 Bar and Circle Graphs
- Graph survey data
- Discuss properties of bar graphs and circle graphs
- Act out the construction of a circle graph

5.10 The Percent Circle: Reading Circle Graphs
- Introduce the percent circle and demonstrate methods for use
- Measure circle graphs

5.11 The Percent Circle: Making Circle Graphs
- Construct a circle graph using the percent circle
- Convert bar graphs to circle graphs

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Play Fraction/Percent Concentration	

Suggested Assessments:
• Journal 1 p121-122
Study Link
•Journal 1 p124-126
Study Link
•Journal 1 p129-131
Study Link
•Journal 1 p134-135
Study Link
•Journal 1 p137-140
Study Link
•Journal 1 p142-143
Study Link
•Game – Teacher Observation
•Game – Teacher Observation
•Journal 1 p150-151
Study Link
•Journal 1 p153-154
Study Link
•Journal 1 p157-158
Study Link
•Journal 1 p160 -161
Study Link
•Progress Check 5 - Written Assessment and Open Response

Theme/Unit: **Unit 6:**	**Suggested Sequence: 10 Days**

NJSLS:

5.NBT.3a.-Read and write decimals to thousandths using base-ten numerals, number names, and expanded. form, e.g., 347.392=3 x 100 + 4 x 10 + 7 x 1 + 3 x (1/10) + 9 x (1/100) + 2 x (1/1000)

5.NBT.4. - Use place value understanding to round decimals to any place.

5.NBT.7. - Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties or operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

5.NF.1 - Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. [In general, a/b + c/d = (ad + bc)/bd.]*

5.NF.2.- Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7<1/2.*

5.NF.3.- Interpret a fraction as division of the numerator by the denominator (a/b=a÷b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g. by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*

5.NF.5b. - Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n x a)/(n x b) to the effect of multiplying a/b by 1.

5.MD.1. - Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems

5.MD.2. - Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations of fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were distributed equally.*

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• How can the collection, organization, interpretation, and display of data be used to answer questions? • How can experimental and theoretical probabilities be used to make predictions or	• The results of a statistical investigation can be used to support or refute an argument . • Experimental results tend to approach theoretical probabilities after a large number of trials.

draw conclusions? • How can attributes be used to classify data/objects?	• Grouping by attributes (classification) can be used to answer mathematical questions.

Knowledge, Skills, and Instructional Objectives:
•6.1 Review data landmarks and organize data
•6.2 Develop measurement and probability concepts
•6.3 Introduce stem and leaf plots; provide practice for measuring lengths and using a protractor
•6.4 Provide experiences with data presented in line plots and stem and leaf plots
•6.5 Investigate the relationship between sample size and the reliability of derived results
•6.6 Provide experiences with displaying and analyzing data
•6.7 Introduce contour maps as data displays
•6.8 Provide a relative distance model with addition and subtraction of fractions
•6.9 Provide additional references for fraction concepts
•6.10 Reinforce the use of common denominators to compare, add and subtract fractions
•6.11 Assess students' progress on using data and addition and subtraction of fractions

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Data landmarks Stem and leaf plots	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
6.1 Organizing Data
- Organize and describe class data
- Create a stick on note graph

6.2 Natural Measures of Length
- Find personal measures for various body measures
- Review metric conversions

6.3 Stem-and-Leaf Plots for Hand and Finger Measures
- Organize data in a stem and leaf plot

6.4 Mystery Plots
- Identify mystery line plots
- Identify mystery stem and leaf plots

6.5 Sample Size and Good Conclusions
- Take a small sample
- Graph and predict on the basis of a sample
- Investigate how sample size affects the results of chance events

6.6 Analysis of Sample Data
- Display and analyze survey data

6.7 American Tour: Climate
- Use climate maps to answer questions

6.8 Using a Slide Rule to Add and Subtract Fractions
- Make a fraction slide rule
- Add and subtract with the fraction slide rule

6.9 Clock Fractions and Common Denominators
- Use a clock to add and subtract fractions
- Use a common denominator

6.10 Quick Common Denominators
- Use fraction sticks to demonstrate another way to find common denominators
- Use common denominators to compare, add, and subtract fractions
- Find common denominators

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Create fraction riddles for classmates to solve	

Suggested Assessments:
• Journal 1 p164-165
Study Link
•Journal 1 p168-169
Game – Teacher Observation
•Journal 1 p173-174
Study Link
•Journal 1 p176-178
Study Link
•Game – Teacher Observation
Study Link
•Journal 1 p183-185
Study Link
•Journal 1 p187-188
Study Link
•Teacher observation of slide rule usage
•Journal 1 p194-195
•Journal 1 p200-201
Study Link
•Progress Check 6 - Written Assessment and Open Response

Theme/Unit: **Unit 7:**	**Suggested Sequence: 13 Days – use at end of year - MP4**

NJSLS:

5.0A.1.- Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.0A.2. - Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 x (8 + 7). Recognize that 3 x (18932 + 921) is three times as large as 18932 + 921without having to calculate the indicated sum or product.*

5.NBT.1 - Recognize that in a multi-digit number, a digit in the ones place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

5.NBT.2.- Explain patterns in the number of zeroes of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

5.NBT.3b.-Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and , symbols to record the results of comparisons.

5.NF.1 - Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. [In general, a/b + c/d = (ad + bc)/bd.]*

5.MD.2. - Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations of fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were distributed equally.*

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• How can we compare and contrast numbers? • How do operations affect numbers? • How can change be best represented mathematically?	• A quantity can be represented numerically in various ways. Problem solving depends upon choosing wise ways. • The magnitude of numbers affects the outcome of operations on them. • The symbolic language of algebra is used to communicate and generalize the patterns in mathematics.

Knowledge, Skills, and Instructional Objectives:

•7.1 Develop concepts related to exponential notation
•7.2 Introduce number and word notation for large numbers and exponential notation for powers of ten
•7.3 Introduce Scientific Notation
•7.4 Review the use of parentheses
•7.5 Introduce rules of order of operations
•7.6 Introduce the construction of line graphs
•7.7 Review the uses, ordering, and comparing of negative numbers
•7.8 Develop rules for adding positive and negative numbers

•7.9 Develop a rule for subtracting positive and negative numbers
•7.10 Provide experiences with models for adding and subtracting positive and negative numbers
•7.11 Facilitate exploring using calculators to add and subtract positive and negative numbers
•7.12 Assess students' progress on exponents and negative numbers

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Scientific notation	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

7.1 Exponential Notation
- Work with exponents on a calculator
- Explore exponent patterns

7.2 Exponential Notation for Powers of 10
- Introduce exponential notation for powers of 10
- Use guides for powers of 10
- Find patterns in a place value chart

7.3 Scientific Notation
- Practice translation of numbers from scientific notation to standard notation
- Use scientific notation on a calculator

7.4 Parentheses in Number Sentences
- Match number stories to appropriate expressions using parentheses
- Write number stories to match expressions

7.5 Order of Operations
- Introduce rules for order of operations
- Evaluate expressions by applying rules for the order of operations

7.6 Using Negative Numbers
- Graph positive and negative numbers on a number line
- Compare and order positive and negative numbers
- Explore positive and negative numbers in the stock market

7.7 Addition of Positive and Negative Numbers

- Use plus and minus counters to calculate account balances
- Find sums of positive and negative numbers
- Develop rules for adding positive and negative numbers

7.8 Subtraction of Positive and Negative Numbers

- Develop a rule for subtracting positive and negative numbers
- Model subtraction with plus and minus counters
- Play the Advanced Credits/Debits game

7.9 Using a Slide Rule to Add and Subtract

- Demonstrate the slide rule and add and subtract using it

7.10 Calculator Practice: Working with Negative Numbers
Introduce addition and subtraction of positive and negative numbers using a calculator

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Play Exponent Ball Play Scientific Notation Toss	

Suggested Assessments:

• Game – Teacher Observation
Study Link
•Journal 2 p212
Study Link
•Journal 2 p214-216
Study Link
•Journal 2 p219-220
Study Link
•Journal 2 p222-223
Study Link
•Journal 2 p226-227
Study Link
•Journal 2 p229-230
Study Link
•Account Balance Counter Activity (Journal 2 p232-233)
Study Link
•Journal 2 p237-240
Study Link
•Teacher Observation Of Slide Rule Usage
Journal 2 p242
Study Link
•Teacher Observation of calculator use
Journal 2 p244-245
•Progress Check 7 - Written Assessment and Open Response

Theme/Unit: **Unit 8:**	**Suggested Sequence: 18 Days**

NJSLS:

5.NF.1 - Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. [In general, a/b + c/d = (ad + bc)/bd.]*

5.NF.2.- Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7<1/2.*

5.NF.4a.- Interpret the product (a/b) x q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a x q ÷ b. *For example, use a visual fraction model to show (2/3) x 4 = 8/3, and create a story context for this equation. Do the same with (2/3) x (4/5) = 8/15. [In general, (a/b) x (c/d) = ac/bd].*

5.NF.4b.- Find the area of a rectangle with fractional side lengths by tiling it with unit squares of appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

5.NF.5a.- Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.

5.NF.5b. - Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n x a)/(n x b) to the effect of multiplying a/b by 1.

5.NF.6. - Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual. fraction models or equations to represent the problem

5.NF.7a.- Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4 = 1/12 because (1/12) x 4 = 1/3.*

5.NF.7b. - Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 x (1/5) = 4.*

5.NF.7c. - Solve real world problems involving the division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g. by using visual fraction models and equations to. represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb. of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins*

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Why express quantities, measurements, and number relationships in different ways?	• Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers.

Knowledge, Skills, and Instructional Objectives:
•8.1 Review the use of equivalent fractions in comparisons
•8.2 Develop addition concepts related to mixed numbers
•8.3 Develop subtraction concepts related to mixed numbers
•8.4 Practice adding fractions with unlike denominators and using a calculator to solve fraction problems
•8.5 Find a fraction of a fraction
•8.6 Develop a fraction multiplication algorithm
•8.7 Find the product of a whole number and a fraction
•8.8 Introduce multiplication with mixed numbers
•8.9 Broaden students' understanding of calculating percent's to include discount
•8.10 Practice finding the whole when given a fraction or percent of the whole
•8.11 Provide experience with locating information on maps and charts and using percent's to make estimates
•8.12 Introduce division of fractions and mixed numbers
•8.13 Assess students' progress on fractions and ratios

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Algorithm	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
8.1 Review: Comparing Fractions
- Rename fractions as equivalent fractions
- Compare fractions using common denominators
- Order fractions on a rope

8.2 Adding Mixed Numbers
- Add mixed numbers with fractions that have the same denominator
- Add mixed numbers with fractions that have like denominators
- Add mixed numbers

8.3 Subtracting Mixed Numbers
- Subtract mixed numbers with renaming
- Introduce an alternate method for subtracting mixed numbers

8.4 Calculator Fractions; Fractions Action, Fraction Friction

- Explore use of the fraction operation keys on a calculator
- Play Fraction Action, Fraction Friction

8.5 Fractions of Fractions
- Find a fraction of a fraction
- Play Fraction Spin

8.6 An Area Model for Fraction Multiplication
- Use the area model for fraction multiplication
- Develop a fraction multiplication algorithm

8.7 Multiplication of Fractions and Whole Numbers
- Use an area model to represent the product of a fraction and a whole number
- Use the fraction multiplication algorithm to calculate the product of a fraction and a whole number

8.8 Multiplication of Mixed Numbers
- Multiply with mixed numbers
- Multiply fractions and mixed numbers

8.9 Finding a Percent of a Number
- Find the percent of a number
- Use fractions to find the percent of a number
- Calculate a discount when given the percent of a discount

8.10 Using Unit Fractions and Unit Percent's to Find the Whole
- Use unit fractions to find the whole
- Use unit percent's to find the whole
- Solve "What's My Rule?" problems

8.11 American Tour: Rural and Urban
- Investigate data
- Estimate rural and urban populations

8.12 Fraction Division
- Introduce and practice common denominator division
- Solve division problems with fraction or mixed number answers

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Play Fraction Toss	

Suggested Assessments:

• Journal 2 p248-249
Game – Teacher Observation
•Journal 2 p251-252
Study Link
•Journal 2 p254-255
Game —Teacher Observation
•Game – Teacher Observation
Study Link
•Journal 2 p259-261
Study Link
•Journal 2 p264-266
Study Link
•Journal 2 p269-270
Study Link
•Journal 2 p273-275
Study Link
•Journal 2 p277-278
Study Link

- Journal 2 p280-282
  Study Link
- Journal 2 p284-286
  Study Link
- Journal 2 p288-289
  Study Link
- Progress Check 8 - Written Assessment and Open Response

Theme/Unit: **Unit 9:**	**Suggested Sequence: 14 days**

NJSLS:

5.NBT.2.- Explain patterns in the number of zeroes of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

5.NBT.3a.-Read and write decimals to thousandths using base-ten numerals, number names, and expanded. form, e.g., 347.392=3 x 100 + 4 x 10 + 7 x 1 + 3 x (1/10) + 9 x (1/100) + 2 x (1/1000)

5.NBT.4. - Use place value understanding to round decimals to any place.

5.NF.2.- Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7<1/2.*

5.NF.4b.- Find the area of a rectangle with fractional side lengths by tiling it with unit squares of appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

5.NF.7a.- Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4 = 1/12 because (1/12) x 4 = 1/3.*

5.NF.7b. - Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 x (1/5) = 4.*

5.NF.7c. - Solve real world problems involving the division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g. by using visual fraction models and equations to. represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb. of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins*

5.MD.1. - Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems

5.MD.3.- Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

5.MD.3a.- A cube with side length 1 unit, called a “unit cube” is said to have “one cubic unit” of volume, and can be used to measure volume.

5.MD.3b.- A solid figure which can be packed without gaps and overlaps using n unit cubes is said to have a volume of n cubic units.

5.MD.4.- Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.

5.MD.5a.- Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge of lengths,. equivalently by multiplying the height by the area of the base. Represent three-fold whole-number products as volumes, e.g., to represent the associative property of multiplication

5.MD.5b.- Apply the formulas V = l x w x h and V = B x h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and. mathematical problems

5.MD.5c.- Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

5.G.1. **-** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the

two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

5.G.2. - Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situations.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:

- Why express quantities, measurements, and number relationships in different ways?
- Why does "what" we measure influence "how" we measure?
- Why display data in different ways?
- How does geometry better describe objects?
- How does a digit's position affect its value?

Enduring Understandings:

- Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers.
- Data displays describe and represent data in alternative ways.
- Geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.
- Understanding place value can lead to number sense and efficient strategies for computing with numbers.

Knowledge, Skills, and Instructional Objectives:

•9.1 Reinforce students' understanding of coordinate grid structures and vocabulary
•9.2 Reinforce plotting coordinates and their relationships between ordered number pairs and transformations of figures in a plane
•9.3 Reinforce plotting coordinates and their relationships between ordered number pairs and transformations of figures in a plane
•9.4 Reinforce students' understanding of area concepts and units of area
•9.5 Introduce the rectangular method for finding areas of polygons
•9.6 Provide experiences with the use of formulas for the area of triangles and parallelograms
•9.7 Reinforce the use of sampling to make estimates
•9.8 Provide experiences with using a formula for the volume of rectangular prisms
•9.9 Provide experiences for using a formula for the volume of right prisms
•9.10 Reinforce relationships between the liter, milliliter and cubic centimeter
•9.11 Assess students' progress with coordinates, area, volume, and capacity

Suggested Vocabulary:

Plotting coordinates
Transformations of figures

Technology/21st Century/Cross-curricular Connections:

Technology:

8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the

	individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

9.1 Hidden Treasures: A Coordinate Game
- Graph a picture
- Play the Hidden Treasure Game
- Match number stories to graphs

9.2 Coordinate Graphs: Part 1
- Locate, plot, and read number pairs
- Transform and plot ordered number pairs
- Plot pictures and find coordinates in the classroom

9.3 Coordinate Graphs: Part 2
- Transform and plot ordered number pairs
- Discuss the results of operations on ordered number pairs

9.4 Areas of Rectangles
- Discuss and apply area formulas for rectangles

9.5 The Rectangle Method for Finding Area
- Find the area of nonrectangular figures
- Apply the rectangle method for finding the area of triangles and parallelograms

9.6 Formulas for the Area of Triangles and Parallelograms
- Identify base and height
- Use the rectangle method to find the area of triangles and parallelograms

9.7 Earth's Water Surface and the School's Land Area
- Locate points on land or water
- Estimate the ground area of the school
- Write area number stories

9.8 Volume of Rectangular Prisms
- Define base and height for rectangular prisms
- Develop a formula for finding the volume of rectangular prisms

9.9 Volume of Prisms
- Verify the volume formula for prisms
- Build a triangular prism

9.10 Capacity: Liter, Milliliter, and Cubic Centimeter
- Show that 1 liter equals 1000 milliliters
- Show that 1 liter equals 1000 cubic centimeters
- Solve problems about volume and capacity

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Create problems using the rectangular method for area for students in another class to solve	

Suggested Assessments:

• Game – Teacher Observation
Study Link
•Journal 2 p296-298
Study Link
•Journal 2 p300-301
Study Link
•Journal 2 p304-305
Study Link
•Journal 2 p308-310
Study Link
•Journal 2 p312-314
Study Link
•Journal 2 p316
•Journal 2 p321-322
Study Link
•Journal 2 p324-325
Study Link
•Journal 2 p327-329
Study Link
•Progress Check 9- Written Assessment and Open Response

Theme/Unit: **Unit 10:**	**Suggested Sequence: 14 days**

NJSLS:

5.0A.2**. -** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 x (8 + 7). Recognize that 3 x (18932 + 921) is three times as large as 18932 + 921without having to calculate the indicated sum or product.*

5.0A.3**. -** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*

5.NBT.2.- Explain patterns in the number of zeroes of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

5.NBT.4. - Use place value understanding to round decimals to any place.

5.NBT.7. - Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties or operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

5.NF.2.- Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7<1/2.*

5.MD.1. - Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems

5.MD.2. - Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations of fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were distributed equally.*

5.MD.3.- Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

5.MD.3a.- A cube with side length 1 unit, called a "unit cube" is said to have "one cubic unit" of volume, and can be used to measure volume.

5.MD.3b.- A solid figure which can be packed without gaps and overlaps using n unit cubes is said to have a volume of n cubic units.

5.MD.4.- Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.

5.MD.5a.- Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge of lengths,. equivalently by multiplying the height by the area of the base. Represent three-fold whole-number products as volumes, e.g., to represent the associative property of multiplication

5.MD.5b.- Apply the formulas V = l x w x h and V = B x h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and. mathematical problems

5.MD.5c.- Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

5.G.1. **-** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first

number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

5.G.2. - Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situations.

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:

- Why express quantities, measurements, and number relationships in different ways?
- Why does "what" we measure influence "how" we measure?
- Why display data in different ways?
- How does geometry better describe objects?
- Why express quantities, measurements, and number relationships in different ways?
- How does a digit's position affect its value?
- In what ways can operations affect numbers?
- How can different strategies be helpful when solving a problem?

Enduring Understandings:

- Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers.
- Data displays describe and represent data in alternative ways.
- Geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.
- Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers.
- Understanding place value can lead to number sense and efficient strategies for computing with numbers.
- Mathematical operations are used in solving problems in which a new value is produced from one or more values.
- Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions

Knowledge, Skills, and Instructional Objectives:

•10.1 Introduce the pan-balance approach to solving simple equations
•10.2 Develop a pan-balance approach for solving sets of two equations and two unknowns
•10.3 Introduce the use of algebraic expressions to represent situations and describe rules
•10.4 Develop representational forms for rates
•10.5 Provide experience with using a formula for a prediction tool
•10.6 Provide experiences with interpreting tables and graphs
•10.7 Provide experiences with interpreting line graphs
•10.8 Provide experience with comparison ratios and the use of the fractional number Pi
•10.9 Introduce a formula to calculate the area of a circle
•10.10 Assess students' progress on using data, algebra concepts and skills

Suggested Vocabulary:

Algebraic expressions
pi

Technology/21st Century/Cross-curricular Connections:

Technology:

8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems

	individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

10.1 Pan-Balance Problems
- Solve pan-balance problems
- Weigh pennies

10.2 Pan Balance Problems with Two Balances
- Solve complex pan-balance problems

10.3 Algebraic Expressions
- Write algebraic expressions to represent situations described in words
- Express the rule for "What's My Rule?" in words and as algebraic expressions

10.4 Rules, Tables, and Graphs: Part 1
- Display a rate of speed with a table of values and a line graph
- Compare three ways of representing rates

10.5 American Tour: Predicting Old Faithful's Next Eruption
- Predict when Old Faithful will erupt next
- Apply the Old Faithful eruption formula

10.6 Rules, Tables, and Graphs: Part 2
- Solve a footrace problem and graph the footrace data

10.7 Reading Graphs
- Interpret "mystery" graphs
- Interpret "mystery" line plots

10.8 Circumference of a Circle
- Investigate the circumference of a circle
- Demonstrate the value of pi

10.9 Area of Circles
- Investigate the relationship between the radius and the area of circles
- Use a formula to find the area of a circle

Extension Strategies/Activities: Predict volcanic eruptions based on the methods used to predict Old Faithful's Next Eruption	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Suggested Assessments:

- Journal 2 p333-334
  Study Link
- Journal 2 p336-338
  Study Link
- Journal 2 p341-343
  Study Link
- Journal 2 p346-349
  Study Link
- Journal 2 p350-351
  Study Link
- Journal 2 p354-355
  Study Link
- Journal 2 p356-358
  Study Link
- Journal 2 p361-362
  Study Link
- Journal 2 p364-366
  Study Link
- Progress Check 10 - Written Assessment and Open Response

Theme/Unit: **Unit 11:**	**Suggested Sequence: 10 Days**

NJSLS:

5.NBT.2.- Explain patterns in the number of zeroes of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

5.NBT.4. - Use place value understanding to round decimals to any place.

5.NF.4b. - Find the area of a rectangle with fractional side lengths by tiling it with unit squares of appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

5.MD.1. - Convert among different-sized standard measurement units within a given measurement system (e.g.,

5.MD.3.- Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

5.MD.3a.- A cube with side length 1 unit, called a "unit cube" is said to have "one cubic unit" of volume, and can be used to measure volume.

5.MD.3b.- A solid figure which can be packed without gaps and overlaps using n unit cubes is said to have a volume of n cubic units.

5.MD.4.- Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.

5.MD.5a.- Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge of lengths,. equivalently by multiplying the height by the area of the base. Represent three-fold whole-number products as volumes, e.g., to represent the associative property of multiplication

5.MD.5b.- Apply the formulas V = l x w x h and V = B x h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and. mathematical problems

Big Ideas:

Numeric reasoning involves fluency and facility with numbers.
Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics**.**
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Essential Questions:	**Enduring Understandings:**
• Why express quantities, measurements, and number relationships in different ways? • Why does "what" we measure influence "how" we measure? • Why display data in different ways? • Why express quantities, measurements, and number relationships in different ways? • How does a digit's position affect its value?	• Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers. • Data displays describe and represent data in alternative ways. • Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers. • Understanding place value can lead to number sense and efficient strategies for computing with numbers.

Knowledge, Skills, and Instructional Objectives:

•11.1 Review the names and properties of geometric solids
•11.2 Provide experience comparing the properties of geometric solids
•11.3 Introduce the formula for the volume of cylinders
•11.4 Provide experiences with investigating the relationships between the volumes of geometric solids

•11.5 Introduce finding the volume of irregular objects using a water displacement method
•11.6 Provide experience with converting measurements among units of weight, capacity and volume
•11.7 Introduce finding the surface area of prisms, cylinders and pyramids
•11.8 Assess students' progress on volume

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Properties Displacement	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

11.1 Review of Geometric Solids: Part 1
- Explore additional characteristics of geometric solids

11.2 Review of Geometric Solids: Part 2
- Compare properties of prisms, pyramids, cylinders, and cones
- Play 3-D Shape Sort

11.3 Volume of Cylinders
- Verify the cylinder volume formula
- Calculate the volume of cylinders

11.4 Volume of Pyramids and Cones
- Explore the relationship between the volumes of prisms and pyramids
- Explore the relationship between the volumes of cylinders and cones

11.5 Finding Volume by a Displacement Method
- Demonstrate the displacement method for finding the volume of an irregular object

11.6 Capacity and Weight
- Solve problems using units of weight and capacity
- Review equivalent measures

11.7 Surface Area
- Find the surface area of a can
- Find the surface area of a prism and a pyramid

Extension Strategies/Activities:	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.
Predict volumes of irregular objects (justify predictions) Compare predictions to actual results	

Suggested Assessments:
•Journal 2 p369-370
Study Link
•Game – Teacher Observation
Study Link
•Journal 2 p375-377
Study Link
•Journal 2 p379
Study Link
•Journal 2 p382-383
(Displacement Experiment)
Study Link
•Journal 2 p386-387
Study Link
•Journal 2 p389-390
•Progress Check – Written Assessment and Open Response

Theme/Unit: **Unit 12:**	**Suggested Sequence: 9 days**

NJSLS:

5.NBT.4.- Use place value understanding to round decimals to any place.

5.NF.7b.- Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 x (1/5) = 4.*

5.NF.7c.- Solve real world problems involving the division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g. by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb. of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins.*

5.MD.2. - Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations of fractions for this grade to solve problems involving information presented in line plots. . *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were distributed equally*

5.G.1. - Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

Big Ideas:
Numeric reasoning involves fluency and facility with numbers.
Spatial sense and geometric relationships are a means to solve problems and make sense of a variety of phenomena.
Measurement is a tool to quantify a variety of phenomena.
Algebra provides language through which we communicate the patterns in mathematics.
Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.

Probability quantifies the likelihood that something will happen and enables us to make predictions and informed decisions.

Essential Questions:	**Enduring Understandings:**
• Why express quantities, measurements, and number relationships in different ways? • Why does "what" we measure influence "how" we measure? • Why display data in different ways? • How does geometry better describe objects? • Why express quantities, measurements, and number relationships in different ways? • How does a digit's position affect its value?	• Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers. • Data displays describe and represent data in alternative ways. • Geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving. • Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers. • Understanding place value can lead to number sense and efficient strategies for computing with numbers.

Knowledge, Skills, and Instructional Objectives:
•12.1 Find the greatest common factor and the least common multiple of two numbers
•12.2 Introduce the Multiple Counting Principle and tree diagrams
•12.3 Provide experiences with the use of ratios and ratio comparisons
•12.4 Provide experience with ratios of part of a set to the whole set
•12.5 Introduce writing number models for ratio number stories
•12.6 Provide experience calculating rates from data
•12.7 Provide experience with using graphs to represent, compare and interpret data
•12.8 Provide experience with calculating rates and using rates to compare data
•12.9 Assess students' progress on probability, ratios and rate

Suggested Vocabulary:	**Technology/21st Century/Cross-curricular Connections:**
Tree diagrams	**Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management.

	CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:

12.1 Factor Trees
- Make factor trees and use them to find the greatest common factors and least common multiples
- Use factor trees to find common denominators

12.2 Choices, Tree Diagrams, and Probability
- Use multiplication counting principle and tree diagrams
- Solve combination problems

12.3 American Tour: Ratio Exploration
- Read and write rations in equivalent forms
- Use ratios to examine trends

12.4 Ratios to Parts to Wholes
- Solve ratio problems
- Use ratios to compare

12.5 Number Models for Ratio Number Stories
- Solve ratio number stories with the help of number models
- Use cross multiplication to solve ratio problems

12.6 Finding Your Heart Rate
- Find heart rates
- Calculate heart beats

12.7 Collecting, Graphing, and Interpreting Exercise Data
- Record heart rates after exercise
- Construct side by side line plots and compare them

12.8 Finding Your Cardiac Output
- Calculate cardiac output
- Compare output at rest and after exercise

Extension Strategies/Activities: Make a frequency table of heart rates Identify the mean, median, and mode of the data	**Modification Strategies/Activities:** see Addendum for modifications for Gifted and Talented, English Language Learners, At-Risk Students and Students with Disabilities, including 504 students.

Suggested Assessments:

•Journal 2 p393-396
Study Link
•Journal 2 p398-400
Study Link
•Journal 2 p404-405
Study Link
•Journal 2 p408-409
Study Link
•Journal 2 p412-413
Study Link
•Journal 2 p416 (Heart Activity)
Game – Teacher Observation
•Journal 2 p418-419
•Journal 2 p424-425 (Heart Pump Activity)
Study Link
•Progress Check 12 – Written Assessment and Open Response

6th Grade

Theme/Unit: Ratios and Proportional Relationships	**Suggested Sequence:**

NJSLS:

6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there." was 1 beak." "For every vote candidate A received, candidate C received nearly three votes

6.RP.A.2 Understand the concept of a unit rate a/b associated with a ratio a:b with $b \neq 0$, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger.

6.RP.A.3.a Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

6.RP.A.3.b Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?

6.RP.A.3.c Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

6.RP.A.3.d Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

Big Ideas:

- Understand ratio concepts and use ratio reasoning to solve problems.

Essential Questions:	**Enduring Understandings:**
• How do mathematical ideas interconnect and build on one another to produce a coherent whole? • How can we compare and contrast numbers?	• One representation may sometimes be more helpful than another; and, used together, multiple representations give a fuller understanding of a problem. • A quantity can be represented numerically in various ways. Problem solving depends upon choosing wise ways.

Knowledge, Skills, and Instructional Objectives:

- To understand and apply the concept of a ratio.
- To understand the concept of a unit rate.
- To use rate language.
- To solve problems involving ratios.
- To solve problems involving rates.
- To make tables of equivalent ratios.
- To find missing values in tables of equivalent ratios.
- To use tables to compare ratios.
- To solve unit rate problems.
- To find a percent of a quantity.
- To find the whole, given a part and the percent.
- To convert measurement units.
- To transform measurement units when multiplying or dividing quantities.

Instructional Materials/Resources:	**Suggested Vocabulary:**
Newspaper article [12-1]; Markers, 2-Color Counters [12-6]; Coordinate Grids [13-5]; Masking Tape, Yardsticks and rulers [16-1]; Inch Rulers, set of 3 classroom objects [16-3]; Inch & Centimeter rulers, food containers with weight or capacity given in customary units [16-4]; Problem-Solving Recording Sheet [16-6];	ratio, rate, unit rate, proportion, terms, formula, percent, capacity, meter, gram, liter, centi-, milli-, kilo-
	Technology: Interactive Learning Recording Sheet 8, Ruler [14-3]

Recommended Instructional Activities:

- Lesson 7-7 Make A Table [Problem Solving]
- Lesson 12-1 Understanding Ratios
- Lesson 12-3 Understanding Rates/ Unit Rates
- Lesson 12-4 Comparing Rates
- Lesson 12-6 Draw a Picture [Problem Solving]
- Lesson 13-1 Using Ratio Tables
- Lesson 13-2 Using Unit Rates
- Lesson 13-5 Ratios and Graphs
- Lesson 14-3 Percent's Greater Than 100- Less Than 1
- Lesson 14-5 Percent of a Number
- Lesson 14-7 Reasonableness [Problem Solving]
- Lesson 16-1 Converting Customary Measures
- Lesson 16-2 Converting Metric
- Lesson 16-4 Relating Customary & Metric Units
- Lesson 16-5 Elapsed Time
- Lesson 16-6 Use Reasoning [Problem Solving]

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Create higher level proportions from challenging numbers [T12] • Create word problems involving proportions; Present to class [T12] • Design own scale drawings; Design a recreation center and prepare a scale drawing [T13] • Write all the positive fractions between 0 and 1 that have a whole number numerator, a denominator of 20, and a decimal value that ends in 5 [T14] • Create and solve their own problems using the measurements in the chart [T16] • Provide chart that uses rods, links, chains, fathoms, and nautical miles and challenge students to create word problems [T16]	• Show each step for solving a proportion in a chart [Missing Number] [Topic 12] • Speed Relay [T12] • Use diagrams to solve proportions [T13] • Provide a circular to find unit prices [T13] • Use benchmark fractions to find the percent of a number mentally [T14] • Provide different objects such as water bottles, books, and have them estimate the length, weight, and capacity of each item in customary and metric measures [T16]

Cross-curricular Connections/Standards:

Technology/21st Century/Cross-curricular Connections:

Technology:

8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.

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Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
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CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

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Suggested Assessments:
Performance Task:

- Students find and use ratios, equal ratios, rates, and unit rates in designing and publishing a cookbook [T12].
- Students use unit rates to plan a road trip using two different travel routes [T13].
- Students find loan interest and profit using three repayment plans for a business [T14].
- Students convert measures to find capacity, distance, length, and weight/mass [T16].

Other Assessment Evidence:

Theme/Unit: The Number System	**Suggested Sequence:**

NJSLS:

6.NS.A.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context or (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?.

6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm

6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

6.NS.B.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2).

6.NS.C.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

6.NS.C.6a Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.

6.NS.C.6b Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

6.NS.C.6c Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

6.NS.C.7a Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.

6.NS.C.7b Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write –3 oC > –7 oC to express the fact that –3 oC is warmer than –7 oC.

6.NS.C.7c Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.

6.NS.C.7d Distinguish comparisons of absolute value from statements about order. For example, recognize that an account

balance less than –30 dollars represents a debt greater than 30 dollars.

6.NS.C.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Big Ideas:

- Apply and extend previous understanding of multiplication and division to divide fractions by fractions.
- Compute fluently with multi-digit numbers and find common factors and multiples.
- Apply and extend previous understandings of numbers to the system of relational numbers.

Essential Questions:

- How can counting, measuring, or labeling help to make sense of the world around us?
- What makes a computational strategy both effective and efficient?
- How do operations affect numbers?
- How do mathematical representations reflect the needs of society across cultures?

Enduring Understandings:

- Numeric fluency includes both the understanding of the ability to appropriately use numbers.
- Computational fluency includes understanding the meaning and the appropriate use of numerical operations.
- The magnitude of numbers affects the outcome of operations on them.
- In many cases, there are multiple algorithms for finding a mathematical solution, and those algorithms are frequently associated with different cultures.

Knowledge, Skills, and Instructional Objectives:

- Divide fractions.
- Solve word problems involving division of fractions.
- Fluently divide multi-digit numbers using the standard algorithm.
- Fluently add multi-digit decimals using the standard algorithm.
- Use the distributive property.
- Show rational numbers of the number line.
- Graph points with negative number coordinates.
- Interpret opposites of numbers.
- Relate signs of numbers in ordered pairs to quadrants.
- Find and position integers on a horizontal or vertical number line.
- Find distances between points with the same first coordinate or the same second coordinate.
- Interpret the absolute value of a rational numbers.
- Relate inequalities to a numbers line.
- Find and position pairs of rational numbers on a coordinate plane.
- Find the greatest common factor of two numbers.
- Find the least common multiple of two numbers.
- Fluently subtract multi-digit decimals using the standard algorithm.
- Fluently divide decimals using the standard algorithm.
- Interpret positive and negative numbers.
- Show points on the number line with negative number coordinates.
- Order rational numbers.
- Understand absolute value.
- Relate signs of numbers in ordered pairs to reflections in the coordinate plane.
- Find and position pairs of integers on a coordinate plane.
- Write, interpret, and explain ordering of rational numbers in real-world contexts.
- Relate absolute value and order.
- Graph points in the coordinate plane.
- Fluently multiply multi-digit decimals using the standard algorithm.

Instructional Materials/Resources:

Number Lines [9-1; 10-8]; Fraction Strips [9-2]; Inch Rulers [9-5]; Thermometers [10-1]; Coordinate Grid Paper [10-9; 10-10]; Decimal grids [3-2; 3-4]; Grocery Store Fliers [3-3]; Number Cubes [3-5]; Decimal Models [3-6; 3-7];

Suggested Vocabulary:

reciprocals; opposites; integers; absolute value; rational number; coordinate plane; x-axis; y-axis; quadrants; ordered pairs; origin; estimate; compatible numbers; inequality

	Technology: Interactive Learning Recording Sheet 2 [10-6]; Interactive Learning Recording Sheet 3 [10-7];

Recommended Instructional Activities:

- Lesson 9-1 – Understanding Division of Fractions
- Lesson 9-2 – Dividing a Whole Number by a Fraction
- Lesson 9-3 – Dividing Fractions
- Lesson 9-4 – Estimating Quotients
- Lesson 9-5 – Dividing Mixed Numbers
- Lesson 2-6 – Evaluating Expressions
- Lesson 1-5 – Multiplying and Dividing By Powers of 10
- Lesson 3-1 – Estimating Sums and Differences
- Lesson 3-2 – Adding and Subtracting
- Lesson 3-3 – Estimating Products and Quotients
- Lesson 3-4 – Multiplying Decimals
- Lesson 3-5 – Dividing Whole Numbers
- Lesson 3-6 – Dividing By A Whole Number
- Lesson 3-7 – Dividing Decimals
- Lesson 3-10 – Multiple-Step Problems [Problem Solving]
- Lesson 5-3 - Greatest Common Factor
- Lesson 7-2 – Least Common Factor
- Lesson 9-7 – Look For A Pattern [Problem Solving]
- Lesson 10-1 – Understanding Integers
- Lesson 10-2 – Comparing and Ordering Integers
- Lesson 10-3 – Rational Numbers on a Number Line
- Lesson 10-4 – Adding Integers
- Lesson 10-5 – Subtracting Integers
- Lesson 10-6 – Multiplying Integers
- Lesson 10-7 – Dividing Integers
- Lesson 10-8 – Absolute Value
- Lesson 10-9 – Graphing Points on a Coordinate Plane
- Lesson 10-10 – Use Reasoning [Problem Solving
- Lesson 4-4 – Solving Multiplication and Division Equations

Extension Strategies/Activities:

- Create word problems that use the decimal, fraction, and integer computations.

Modification Strategies/Activities:

- Use index card fractions to practice computation [T9]
- Provide detailed notes for each algorithm
- Differentiate through leveled grouping.
- Use integer index cards for computation [T10]
- Vocabulary flash cards

Cross-curricular Connections/Standards:

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Suggested Assessments:
Performance Task:

- Students divide fractions and mixed numbers with like and unlike denominators to rewrite a recipe[T9].
- Students identify and compare rational numbers, integers, and absolute value [T10]
- Students determine combinations of foods that will serve four people without exceeding a weight limit. [T3]

Theme/Unit: **Statistics and Probability**	**Suggested Sequence:**

NJSLS:

6.SP.A.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.
6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
6.SP.A.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number
6.SP.B.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
6.SP.B.5 Summarize numerical data sets in relation to their context, such as by:
6.SP.B.5a Reporting the number of observations
6.SP.B.5b Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
6.SP.B.5c Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
6.SP.B.5d Relating the choice of measures of center and variability to the shape of the data distribution and the context in

which the data were gathered

Big Ideas:

- Develop understanding of statistical variability.
- Summarize and describe distributions.

Essential Questions:	**Enduring Understandings:**
• How can the collection, organization, interpretation, and display of data be used to answer questions? • How can experimental and theoretical probabilities be used to make predications or draw conclusions?	• The message conveyed by the data depends on how the data is collected represented, and summarized, • The result of a statistical investigation can be used to support or refute an argument. • Experimental results tend to approach theoretical probabilities after a large number of trials.

Knowledge, Skills, and Instructional Objectives:

- To understand statistical questions.
- To understand how data are described by a measure of center.
- To understand how data are described by their spread.
- To understand how data are described by the overall shape.
- To understand how a measure of variability describes how the data values in a set vary.
- To display numerical data in plots on a number line.
- To display numerical data in dot plots.
- To display numerical data in box plots.
- To summarize numerical data in relation to their context.
- To report the number of observations for numerical data.
- To describe the nature of the attribute under investigation for numerical data.
- To describe how the investigated attribute was measured and its units of measurement.
- To find the median of a set of data.
- To find the mean of a set of data.
- To find the interquartile range and/or mean absolute deviation of a data set.
- To describe overall patterns of deviations of a data set.
- To relate a measure of center to the shape of the data distribution and context of data collection.
- To relate a measure of variability to the shape of the data distribution and context of data collection.

Instructional Materials/Resources:	**Suggested Vocabulary:**
Tennis ball, meter stick [19-9]; Problem-Solving Recording Sheet [19-10]	Statistical question, data distribution, outlier, mean, average, range, median, mode, frequency table, histogram, box plot, quartiles, absolute deviation, interquartile range (IQR), mean absolute, deviation
	Technology: Interactive Learning Recording Sheet

Recommended Instructional Activities:

- Lesson 19-1 Statistical Questions
- Lesson 19-2 Looking at Data Sets
- Lesson 19-3 Mean
- Lesson 19-4 Median, Mode, and Range
- Lesson 19-5 Frequency Tables and Histograms
- Lesson 19-6 Box Plots

- Lesson 19-7 Measures of Variability
- Lesson 19-8 Appropriate Use of Statistical Measures
- Lesson 19-9 Summarizing Data Distributions
- Lesson 19-10 [Problem Solving] Try, Check, and Revise

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Have students create their own statistics for others to challenge. Ask pairs of students to make a claim that can be justified by statistics they generate and a claim that cannot be justified [T19]	• Have groups of students use data that is posted on the board and create one data point on the plot [T19]

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Suggested Assessments:

Performance Task:

- Students use data and statistics to analyze surveys and sales from a fund-raising project [T19].

Theme/Unit:	**Suggested Sequence:**

Expressions and Equations	
NJSLS: 6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents. 6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers. 6.EE.A.2.a Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as 5 – y. 6.EE.A.2.b Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression 2 (8 + 7) as a product. of two factors; view (8 + 7) as both a single entity and a sum of two terms 6.EE.A.2.c Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = 1/2. 6.EE.A.3 Apply the properties of operations to generate equivalent expressions. For example, apply the distributive propert to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y. 6.EE.A.4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.. 6.EE.B.5 Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. 6.EE.B..6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. 6.EE.B.7 Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers 6.EE.B.8 Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams 6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at. constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time	
Big Ideas: • Apply and extend previous understandings of arithmetic to algebraic expressions. • Reason about and solve one-variable equations and inequalities. • Represent and analyze quantitative relationships between dependent and independent variables.	
Essential Questions: • How can change be best represented mathematically? • How can patterns, relations, and functions be used as tools to best describe and help explain real-life situations?	**Enduring Understandings:** • The symbolic language of algebra is used to communicate and generalize the patterns in mathematics. • Algebraic representation can be used to generalize patterns and relationships.

• How are patterns of change related to the behavior of functions? • How can we use mathematical models to clarify and describe physical relationships? • What makes an algebraic algorithm both effective and efficient?	• Patterns and relationships can be represented graphically, numerically, symbolically, or verbally. • Mathematical models can be used to describe and quantify physical relationships. • Algebraic and numeric procedures are interconnected and build on another to produce a coherent whole.

Knowledge, Skills, and Instructional Objectives:

- To write numerical expressions with exponents.
- To evaluate numerical expressions with exponents.
- To read and write algebraic expressions.
- To evaluate algebraic expressions.
- To write algebraic expressions that record operations.
- To identify parts of an expression using mathematical terms.
- To view one or more parts of an expression as a single entity.
- To evaluate expressions at specific values of their variables.
- To evaluate expressions that arises from formulas.
- To evaluate expressions using Order of Operations.
- To generate equivalent expressions.
- To identify when two expressions are equivalent.
- To determine the values from a specified set that makes an equation true.
- To determine the values from a specified set that makes an inequality true.
- To solve problems by using variables to represent numbers and write expressions.
- To understand how variables are used.
- To write and solve equations of the form $x + p = q$.
- To write and solve equations of the form $px = q$.
- To write an inequality of the form $x > c$ or $x < c$.
- To recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions.
- To represent solutions of inequalities on number lines.
- To use variables to represent two quantities that change in relationship to one another.
- To analyze relationships between dependent and independent variables.

Instructional Materials/Resources: Trillions Place-Value Chart [1-3]; Unit cubes, pan balance [4-1]; Paper bag [4-2, 4-3, 4-4]; Coordinate Grid Paper [15-4]; Two-Color counters, Problem-Solving Recording Sheet [15-7]; Centimeter Grid Paper [17-1, 17-2]; scissors [17-3]	**Suggested Vocabulary:** Power, exponential form, exponent, base, variable, algebraic expression, coefficient, Commutative Property of Addition, Commutative Property of Multiplication, Associative Property of Addition, Associative Property of Multiplication, Identity Property of Addition, Identity Property of Multiplication, order of operations, Distributive Property, evaluate, substitution, input/output table, inequality, equation, Addition Property of Equality, Subtraction Property of Equality, Multiplication Property of Equality, Division Property of Equality, inverse relationship, perimeter, area, formula, T-table, linear equation

	Technology: Interactive Learning Recording Sheet 1 [2-6]; Interactive Learning Recording Sheet 9[2-9]

Recommended Instructional Activities:

- Lesson 2-1 Using Variables to Write Expressions
- Lesson 2-2 Properties of Operations
- Lesson 2-3 Order of Operations
- Lesson 2-4 The Distributive Property
- Lesson 2-6 Evaluating Expressions
- Lesson 2-7 Using Expressions to Describe Patterns
- Lesson 2-8 [Problem Solving] – Make a table
- Lesson 3-8 Evaluating Expressions
- Lesson 3-9 Solutions for Equations and Inequalities
- Lesson 4-1 Properties of Equality
- Lesson 4-2 Solving Addition and Subtraction Equations
- Lesson 4-4 Solving Multiplication and Division Equations
- Lesson 15-2 Patterns and Equations
- Lesson 15-4 Graphing Equations
- Lesson 11-9 [Problem Solving] Make a Table and Look for a Pattern
- Lesson 12-5 Distance, Rate, and Time
- Lesson 15-6 Understanding Inequalities
- Lesson 15-7 [Problem Solving] Act It Out and Use Reasoning
- Lesson 17-1 Perimeter
- Lesson 17-2 Area of Rectangles and irregular Figures
- Lesson 17-3 Area of Parallelograms and Triangles

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Student work in groups to generate three expressions with assigned values for four or more variables [T2-6] • Students solve equations that have solutions that are not whole numbers [T4] • Challenge advanced students to make their own tables by using multiple patterns and write the • equations that describe the patterns.	• Replacement Cards for Order of Operations [T2-6] • Show students how they can add or subtract to both sides of the equation by writing the amount under the original equation, allowing the student to work in vertically [T4]. • Use masking tape to create a coordinate grid on the floor. Have students move along the grid to plot points [T15-1]

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Suggested Assessments:

Performance Task:

- Students generate an input/output table for a given situation, and write and evaluate algebraic expressions [T2].
- Students find the missing numbers in the chart showing the packing and pricing of gadgets [T4].
- Students convert measures to find capacity, distance, length, and weight/mass [T16].

Theme/Unit: Geometry	Suggested Sequence:

NJSLS:

6.G.A.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

6.G.A.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the. edge lengths of the prism. Apply the formulas V = l w h and V = B h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems

6.G.A.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems

6.G.A.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Big Ideas:

- Solve real-world and mathematical problems involving area, surface area, and volume.

Essential Questions:	Enduring Understandings:
• How can spatial relationships be described by careful use of geometric language? • How do geometric relationships help us to solve problems and/or make sense of phenomena? • How can we best represent and verify geometric/algebraic relationships? • How can measurements be used to solve problems	• Geometric properties can be used to construct • geometric figures. • Geometric relationships provide a means to make sense of variety of phenomena • Reasoning and/or proof can be used to verify or • refute conjectures or theorems in geometry. • Coordinate geometry can be used to represent and verify geometric/algebraic relationships. • Everyday objects have a variety of attributes, each of which can be measured in many ways. • What we measure affects how we measure it. • Measurements can be used to describe, compare, and make sense of phenomena.

Knowledge, Skills, and Instructional Objectives:

- To find area by composing a figure into rectangles.
- To find area by decomposing a figure into triangles and other shapes.
- To find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths.
- To show that the volume of a right rectangular prism with fractional edge lengths can be found by multiplying the edge lengths of the prism.
- To apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths.
- To draw polygons in the coordinate plane.
- To find the length of a side of a polygon drawn in the coordinate plane.
- To represent three-dimensional figures using nets.
- To use nets to find the surface area of three-dimensional figures

Instructional Materials/Resources:	Suggested Vocabulary:
Coordinate Grids [10-10, 17-2]; Scissors [17-3]; Color tiles, ¼ inch Grid Paper [17-6]; Net for Cylinder, Net for Rectangular Prism, scissors, tape or glue, square and cube models [18-1]; Net for rectangular prism, ¼ inch Grid paper, 1 per pair, scissors, markers [18-2]; Cubes [18-3; 18-4]; Base ten unit cubes, Problem-Solving Recording Sheet [18-5]	Area, volume, vertex, prism, polyhedron, cylinder, pyramid, faces, sphere, net, edge, cone
	Technology: Interactive Learning Recording Sheet 9 [17-3]; Interactive Learning Recording Sheet 12 [18-3];

Recommended Instructional Activities:

- Lesson 10-10 [Problem Solving] Use Reasoning
- Lesson 17-2 Area of Rectangles and Irregular Figures
- Lesson 17-3 Area of Parallelograms and Triangles
- Lesson 17-6 [Problem Solving] Use Objects
- Lesson 18-1 Solid Figures
- Lesson 18-2 Surface Area
- Lesson 18-3 Volume of Rectangular Prisms
- Lesson 18-4 Volume with Fractional Edge Lengths
- Lesson 18-5 [Problem Solving] Use Objects and Reasoning

Extension Strategies/Activities:

- Have students work independently can investigate how the area of a figure changes based upon changes in the lengths of sides of the figure [T17-3]
- Have students use blocks to create a three-dimensional figure using blocks. Then have students draw the top, front, and side views of their shape [T18-3]

Modification Strategies/Activities:

- Have students make a prism using blocks. Then have them find the volume [T18-1]
- Give students several three-dimensional figures. Have them trace the base onto a piece of paper and use a ruler to measure and find the area of the base. Then have them measure the height of the object [T18-3]

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Suggested Assessments:

Performance Task:

- Students find the perimeter and areas of rectangles, squares, parallelograms, and triangles as they decide which shape to use to create a design on the side of a building [T17].
- Students find the volume of rectangular prisms to help them decide how to pack and store an irregular shaped wall hanging, They analyze how changing dimension affects volume, find the surface area of a solid, and count vertices, edges, and faces of a rectangular prism [T18].

7th Grade

Theme/Unit: **Geometry**	**Suggested Sequence:**

NJSLS:

7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

7.G.A.2 Draw (with technology, with ruler and protractor as well as freehand)) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

7.G.A.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids

7.G.B.4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

7.G.B.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

7.G.B.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms

Essential Questions:

- How does geometry help us describe real-world objects?

Knowledge, Skills, and Instructional Objectives:

- Classify angles and identify vertical and adjacent angles
- Identify complementary and supplementary angles
- Draw triangles using given angles or given side lengths
- Identify and classify triangles and find missing angle measures
- Solve problems by making a model
- Use online maps to reproduce a scale drawing at a different scale
- Solve problems involving scale drawings
- Draw 3D figures given the top, side, and front views
- Identify and draw 3D figures
- Describe the relationship between the diameter and circumference of a circle
- Find the circumference of circles
- Develop a formula for the area of a circle
- Find the area of circles
- Find the area of composite figures
- Find the volume of prisms
- Solve problems by solving a simpler problem
- Justify formulas for the volume of pyramids
- Find the volume of pyramids
- Find the surface area of prisms using models and nets
- Find the surface area of prisms
- Compare surface area and volume of rectangular prisms
- Find the surface area of pyramids
- Explore volume and surface area of composite figures
- Find the volume and surface area of composite figures

Instructional Materials/Resources:	**Suggested Vocabulary:**
Plastic drinking straws, patty paper, protractor, paper plates,	Acute angle, acute triangle, adjacent angles, base, complementary angles, cone, congruent, congruent segments, coplanar, cross section, cylinder, diagonal, edge, equilateral triangle, face, isosceles triangle, obtuse angle, obtuse triangle, plane, polyhedron, prism, pyramid, right angle, right triangle, scale, scale drawing, scale factor, scale model, scalene triangle, straight angle, supplementary angles, triangle, vertex, vertical angles, center, circle, circumference, composite figure, diameter, lateral face, lateral surface area, pi, radius, regular pyramid, semicircle, slant height, surface area, volume
	Technology: • Video Tutors • Lessons on Interactive Whiteboard • Online Map IQL

Recommended Instructional Activities:
Are You Ready? Chapter 7, 7-1, 7-2, IQL: Create Triangles, 7-3, PSI: Make a Model, 7-4, 7-5, 7-6, 21st Century Career in Design Engineering, Are You Ready? Chapter 8, IQL: Circumference, 8-1, IQL: Area of Circles, 8-2, 8-3, 8-4, PSI: Solve a Simpler Problem, IQL: Volume of Pyramids, 8-5, IQL: Nets of 3-Dimensional Figures, 8-6, IQL: Relate Surface Area and Volume, 8-7, IQL: Composite Figures, 8-8, 21st Century Career in Landscape Architecture

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• IQL: Investigate Online Maps and Scale Drawings • Unit Project: Turn Over a New Leaf • H.O.T. problems • Extended Response Tests	• Additional Inquiry Labs • Hands-On Activities • Video Tutors

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments:
Performance Task:
Pretest
Mid-chapter quizzes for chapters 7 and 8 (teacher-created)
Chapter tests for Chapters 7 and 8
Unit Test
Unit 4 Project
Other Assessment Evidence:
Student Journal and Portfolio

Theme/Unit: **The Number System**	**Suggested Sequence:**

NJSLS:

7.NS.A.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

7.NS.A.1a Describe situations in which opposite quantities combine to make 0. *For example, In the first round of a game, Maria scored 20 points. In the second round of the same game, she lost 20 points, What is her score at the end of the second round?*

7.NS.A.1b Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.

7.NS.A.1c Understand subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

7.NS.A.1d Apply properties of operations as strategies to add and subtract rational numbers.

7.NS.A.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers

7.NS.A.2a Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

7.NS.A.2b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then –(p/q) = (–p)/q = p/(–q). Interpret quotients of rational numbers by describing real-world contexts.

7.NS.A.2c Apply properties of operations as strategies to multiply and divide rational numbers.

7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

7.EE.B.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If

you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation

Essential Questions:

- How can mathematical ideas be represented?

Knowledge, Skills, and Instructional Objectives:

- Read and write integers, and find the absolute value of an integer
- Model addition of integers
- Add integers
- Model subtraction of integers
- Subtract integers
- Find the distance between two rational numbers on a number line
- Solve problems by looking for a pattern
- Model multiplication of integers
- Multiply integers
- Use properties to prove the rules for multiplying integers
- Divide integers
- Graph rational numbers on the number line
- Write fractions as terminating or repeating decimals and write decimals as fractions
- Compare and order rational numbers
- Add and subtract like fractions on a number line

- Add and subtract fractions with like denominators
- Add and subtract fractions with unlike denominators
- Add and subtract fractions mixed numbers
- Solve problems by drawing a diagram
- Multiply fractions and mixed numbers
- Convert units of measure between the customary and metric systems
- Divide fractions and mixed numbers

Instructional Materials/Resources:

- Red and yellow counters (IQL: Add Integers, 3-2, IQL:Subtract Integers, 3-3)
- Number lines (3-2, 3-3, IQL: Distance on a Number Line)

Suggested Vocabulary:
Absolute value, additive inverse, graph, integer, negative integer, opposites, positive integer, zero pair, bar notation, common denominator, least common denominator, like fractions, rational numbers, repeating decimal, terminating decimal, unlike fractions

Technology:

- Video tutors
- Lessons and videos on Interactive White Board

Recommended Instructional Activities:
Chapter 3 Are You Ready?, 3-1, 3-2, 3-3, IQL: Distance on a Number Line, PSI: Look for a Pattern, 3-4, IQL: Use Properties to Multiply, 3-5, 21st Century Career: Space Weather Forecaster, Chapter 4 Are You Ready?, 4-1, 4-2, 4-3, 4-4, 4-5, PSI: Draw a Diagram, 4-6, 4-7, 4-8, 21st Century Career: Fashion Designer

Extension Strategies/Activities:

- H.O.T. problems
- Extended Response Tests

Modification Strategies/Activities:

- IQL: Adding Integers
- IQL: Subtracting Integers
- IQL: Multiplying Integers
- IQL: Rational Numbers on the Number Line
- IQL: Add and Subtract on the Number Line

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments:
Performance Task:

- Pretest
- Mid-chapter quizzes for chapters 3 and 4 (teacher-created)
- Chapter tests for Chapters 3 and 4
- Unit Test
- Unit 2 Project

Other Assessment Evidence:

- Student Journal and Portfolio

Theme/Unit: **Ratios and Proportional Relationships**	**Suggested Sequence:**

NJSLS:

7.RP.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.

7.RP.2 Recognize and represent proportional relationships between quantities.

7.RP.2a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin

7.RP.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

7.RP.2c Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.

7.RP.2d Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.

7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

Essential Questions

- How can you use mathematics to describe change and model real-world situations?

Knowledge, Skills, and Instructional Objectives:

- Use bar diagrams to solve problems involving ratios
- Determine unit rates
- Simplify complex fractions and find unit rates
- Convert units of measure between derived units to solve problems
- Identify proportional and nonproportional relationships
- Solve problems by using the four-step plan
- Identify proportional relationships by graphing on the coordinate plane
- Compare and contrast proportional and nonproportional linear functions
- Use proportions to solve problems
- Understand slope as it relates to rate of change
- Identify constant rates of change using tables and graphs
- Identify slope using tables and graphs
- Use direct variations to solve problems
- Use percent diagrams to solve problems

- Find percent of a number
- Estimate percent's using fractions and decimals
- Solve problems involving percent's
- Use the percent proportion
- Use the percent equation
- Solve problems by determining reasonable answers
- Use bar diagrams to solve problems involving percent of change
- Find percent of change and percent error
- Solve problems involving sales tax, tips and markup
- Solve problems involving discount
- Solve problems involving simple interest

Instructional Materials/Resources:

- Centimeter cubes (IQL: Proportional and Nonproportional Relationships)

Suggested Vocabulary:
Complex fraction, constant of proportionality, constant rate of change, constant of variation, coordinate plane, cross products, dimensional analysis, direct variation, equivalent ratios, nonproportional, proportion, proportional, ordered pair, origin, quadrants, rate, rate of change, slope, unit rate, unit ratio, x-axis, x-coordinate, y-axis, y-coordinate, discount, gratuity, markdown, markup, percent equation, percent error, percent of change, percent of decrease, percent of increase, percent proportion, principal, sales tax, selling price, simple interest, tip

Technology:

- Video tutors
- Excel spreadsheets
- Lessons and videos on Interactive White Board

Recommended Instructional Activities:
Chapter 1 Are You Ready?, IQL: Unit Rates, 1-1, 1-2, 1-3, 1-4, PSI: The Four-Step Plan, 1-5, IQL: Proportional and Nonproportional Relationships, 1-6, IQL: Rate of Change, 1-7, 1-8, 1-9, 21st Century Career: Biomechanical Engineering, Chapter 2 Are You Ready?, IQL: Percent Diagrams, 2-1, 2-2, IQL: Find Percents, 2-3, 2-4, PSI: Determine Reasonable Answers, IQL: Percent of Change, 2-5, 2-6, 2-7, 2-8, Unit 1 Project

Extension Strategies/Activities:

- IQL: Spreadsheet: Compound Interest
- H.O.T. problems
- Extended Response Tests

Modification Strategies/Activities:

- Differentiated assignments based on level
- Personal Tutor videos

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the

environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments:
Performance Task:

- Pretest
- Mid-chapter quizzes for chapters 1 and 2 (teacher-created)
- Chapter tests for Chapters 1 and 2
- Unit Test
- Unit 1 Project

Other Assessment Evidence:

- Student Journal and Portfolio

Theme/Unit: **Statistics and Probability**	**Suggested Sequence:**

NJSLS:

7.SP.A.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. . Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.

7.SP.B.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For. example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable

7.SP.B.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-

grade science book are generally longer than the words in a chapter of a fourth-grade science book.

7.SP.C.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

7.SP.C.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times

7.SP.C.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

7.SP.C.7a Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.

7.SP.C.7b Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?

7.SP.C.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

7.SP.C.8a Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

7.SP.C.8b Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.

7.SP.C.8c Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?

Essential Questions:

- Why is learning mathematics important?

Knowledge, Skills, and Instructional Objectives:

- Find and interpret the probability of a simple event
- Use an experiment to determine relative frequency
- Find and compare experimental and theoretical probabilities
- Use experimental and theoretical probabilities to decide whether a game is fair or unfair
- Find probabilities of compound events
- Perform probability simulations to model real-world situations involving uncertainty
- Use a simulation to generate frequencies for a compound event
- Solve problems by acting them out
- Use multiplication to count outcomes and find probabilities
- Find the number of permutations of a set of objects and find probabilities
- Find the probability of independent and dependent events
- Predict actions of a larger group by using a sample
- Determine whether sample methods are valid
- Analyze the variation in multiple samples of data
- Recognize when statistics and graphs are misleading
- Solve problems by using a graph

- Use measures of center and the range to compare two populations
- Compare two populations
- Analyze the visual overlap of two numerical data distributions
- Select, organize, and construct appropriate data displays

Instructional Materials/Resources:
Number cubes, plastic cups, red and yellow counters, random number table, spinners, coins, paper bags, red and white counters, blue and red marbles,

Suggested Vocabulary:
Complementary events, compound event, dependent events, experimental probability, fair, Fundamental Counting Principle, independent events, outcome, permutation, probability, random, relative frequency, sample space, simple event, simulation, theoretical probability, tree diagram, uniform probability model, unfair, biased sample, convenience sample, double box plot, double dot plot, population, sample, simple random sample, statistics, survey, systematic random sample, unbiased sample, voluntary response sample

Technology:
- Unit Project: Internet Research
- Video Tutors
- Lessons on Interactive Whiteboard
- Random number generator on graphing calculator or internet

Recommended Instructional Activities:
Are You Ready? Chapter 9, 9-1, IQL: Relative Frequency, 9-2, IQL: Fair and Unfair Games, 9-3, 9-4, IQL: Simulate Compound Events, PSI: Act It Out, 9-5, 9-6, 9-7, 21st Century Career in Medicine, Are You Ready? Chapter 10, 10-1, 10-2, IQL: Multiple Samples of Data, 10-3, PSI: Use a Graph, IQL: Collect Data, 10-4, IQL: Visual Overlap of Data Distributions, 10-5, 21st Century Career in Market Research, Unit Project: Math Genes

Extension Strategies/Activities:
- H.O.T. problems
- Extended Response Tests

Modification Strategies/Activities:
- IQL: Independent and Dependent Events
- Additional Inquiry Labs
- Hands-On Activities
- Video Tutors

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.

CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments:

Performance Task:

- Pretest
- Mid-chapter quizzes for chapters 9 and 10 (teacher-created)
- Chapter tests for Chapters 9 and 10
- Unit Test
- Unit 5 Project

Other Assessment Evidence:

- Student Journal and Portfolio

Theme/Unit: **Expressions and Equations**	**Suggested Sequence:**

NJSLS:

7.EE.A.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

7.EE.A.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."

7.EE.B.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

7.EE.B.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

7.EE.B.4a Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

7.EE.B.4b Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at. least $100. Write an inequality for the number of sales you need to make, and describe the solutions

Essential Questions:

- How can you communicate mathematical ideas effectively?

Knowledge, Skills, and Instructional Objectives:

- Evaluate simple algebraic expressions
- Describe the relationships and extend terms in arithmetic sentences
- Explore patterns in sequence of geometric figures
- Identify and use mathematical properties to simplify algebraic expressions
- Apply the Distributive Property to rewrite algebraic expressions
- Solve problems by making a table
- Simplify algebraic expressions
- Add linear expressions
- Subtract linear expressions
- Use properties of mathematics to factor linear expressions
- Solve addition and subtraction equations
- Solve one-step multiplication and division equations
- Solve equations with rational coefficients
- Solve two-step equations
- Solve two-step equations of the form $p(x+q)=r$
- Solve problems by working backward
- Solve inequalities by using the Addition and Subtraction Properties of Inequality
- Solve inequalities by using the Multiplication and Division Properties of Inequality
- Solve and graph two-step inequalities in one variable

Instructional Materials/Resources:	**Suggested Vocabulary:** Additive Identity Property, algebra, algebraic

• Algebra tiles (IQL: Solve One-Step Addition and Subtraction , Equations, 5-4, 5-5, 5-6, 5-7, 5-8) • Toothpicks (IQL: Sequences) • Counters (5-4	expression, arithmetic sequence, Associative Property, coefficient, Commutative Property, constant, counterexample, define a variable, Distributive Property, equivalent expressions, factor, factored form, like terms, linear expression, monomial, Multiplicative Identity Property, Multiplicative Property of Zero, property, sequence, simplest form, term, variable, Addition Property of Equality, Addition Property of Inequality, Division Property of Equality, Division Property of Inequality, equation, equivalent equation, inequality, Multiplication Property of Equality, Multiplication Property of Inequality, solution, Subtraction Property of Equality, Subtraction Property of Inequality, two-step equation, two-step inequality
	Technology: • Unit Project: Internet Research • Video Tutors • Lessons on Interactive Whiteboard

Recommended Instructional Activities:
Are You Ready? Chapter 5, 5-1, 5-2, IQL: Sequences, 5-3, 5-4, PSI: Make a Table, 5-5, 5-6, 5-7, 5-8, 21st Century Career: Shark Scientist, Are You Ready? Chapter 6, 6-1, 6-2, 6-3, 6-4, 6-5, PSI: Work Backward, 6-6, 6-7, 6-8, 21st Century Career: Veterinary Technician, Unit Project: Stand Up and Be Counted

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• H.O.T. problems • Extended Response Tests	• IQL: Factor Linear Expressions • IQL: Solve One-Step Addition and Subtraction Equations • IQL: Multiplication Equations with Bar Diagrams • IQL: Solve Equations with Rational Coefficients • IQL: Solve Two-Step Equations • IQL: More Two-Step Equations • IQL: Solve Inequalities

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.

CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments:

Performance Task:

Pretest
Mid-chapter quizzes for chapters 5 and 6 (teacher-created)
Chapter tests for Chapters 5 and 6
Unit Test
Unit 3 Project

Other Assessment Evidence:

Student Journal and Portfolio

7th Grade Pre-Algebra

Theme/Unit: Creating, Comparing, and Analyzing Geometric Figures	**Suggested Sequence:**

NJSLS:

7.G.A.2 Draw (with technology, with ruler and protractor as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

7.G.A.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

7.G.B.4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

7.G.B.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

7.G.B.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Essential Questions:

- How can you determine congruence and similarity?

Knowledge, Skills, and Instructional Objectives:

- Examine relationships between pairs of angles
- Examine relationships of angles formed by parallel lines and a transversal
- Find the circumference and area of circles
- Find the circumference of circles
- Solve problems involving circumference
- Find areas of circles
- Use areas of circles to solve problems
- Solve problems involving the area of composite figures
- Identify three-dimensional figures
- Describe and draw vertical, horizontal, angled cross sections of three-dimensional figures
- Find volumes of prisms
- Find volumes of composite figures
- Find the volumes of circular cylinders
- Find the volumes of composite figures involving circular cylinders
- Find the surface area of prisms
- Find lateral area and surface area of prisms
- Find surface area of real-world objects like prisms
- Find the surface area of cylinders
- Find lateral and surface areas of cylinders
- Compare surface areas of cylinders
- Find the lateral areas and surface areas of pyramids and cones

Instructional Materials/Resources:

Circular objects, tape measure, string, rulers, heavy paper, ruler, tape, rice, scissors, empty boxes, cylinder-shaped containers,

Suggested Vocabulary:

Adjacent angles, alternate exterior angles, alternate interior angles, center of rotation, complementary angles, diagonal, dilation, exterior angle, image, interior angle, line of reflection, line segment, parallel lines, perpendicular lines, polygon, reflection, regular polygon, reflection, regular polygon, rotation, rotational symmetry, supplementary angles, tessellation, transformation, translation, transversal, triangle, vertex, vertical angles, bases, center, circle, circumference, composite figure, cone, cross section, cylinder, diameter, edge, face, lateral area, lateral faces, pi, plane, polyhedron, prism, pyramid, radius, regular pyramid, slant height, solids, sphere, surface area, vertex, volume

Technology:

- Video tutors
- Lessons and videos on Interactive White Board

Recommended Instructional Activities:

11-1, IQL:Circles, 12-1, 12-2, 12-3, 12-4, 12-5, 12-6, 21st Century Career in Architecture, IQL: Volume of Pyramids and Cones, IQL: Surface Area of Prisms, 12-8, IQL: Surface Area of Cylinders, 12-9, 12-10

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• IQL: Triangles • Lesson 11-2 • IQL: Create Triangles • Lesson 11-3 • IQL: Transformations • Lesson 11-4 • Lesson 11-5 • Lesson 11-6 • Lesson 11-7 • Lesson 11-8 • Lesson 12-7 • HOT Problems • Extended Response Tests	• Differentiated assignments based on level • Personal Tutor videos

Technology/21st Century/Cross-curricular Connections:

Technology:

8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.

8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments:

Performance Task:

- Pretests
- Mid-chapter quizzes for 12 (teacher-created)
- Chapter test for Chapters12
- Unit Test

Other Assessment Evidence:

- Student Journal and Portfolio

Theme/Unit: **Introduction to Sampling and Inference**	**Suggested Sequence:**

NJSLS:

7.SP.A.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.

7.SP.B.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For. example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable

7.SP.B.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-

7.SP.C.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event

7.SP.C.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.

7.SP.C.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

7.SP.C.7a Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability. that Jane will be selected and the probability that a girl will be selected

7.SP.C.7b Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?

7.SP.C.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

7.SP.C.8a Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs

7.SP.C.8b Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample. space which compose the event

7.SP.C.8c Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?

Essential Questions:

- How are statistics used to draw inferences about and compare populations?

Knowledge, Skills, and Instructional Objectives:

- Use measures of center, choose appropriate measures of center
- Find and use measures of variability to interpret and analyze data
- Find the mean absolute deviation of a set of data
- Compare the mean absolute deviations of two data sets
- Analyze the visual overlap of two numerical data distributions
- Compare two populations using the measures of center and variability
- Identify various sampling techniques
- Determine the validity of a sample and predict the actions of a larger group
- Analyze the variation in multiple samples of data
- Find the probability of simple events
- Find the probability of the complement of an event
- Find the probability of simple events, predict the actions of a larger group
- Find and compare experimental and theoretical probabilities
- Find the number of outcomes for an event
- Find the probability of a compound event
- Use a simulation to generate frequencies for a compound event

Instructional Materials/Resources:
Red and blue pencils, number cubes, random number generator, spinners

Suggested Vocabulary:
Biased sample, box plot, complement, compound event, convenience sample, distribution, double box plot, experimental probability, first quartile, Fundamental Counting Principle, interquartile range, mean absolute deviation, measures of center, measures of variability, outcome, outliers, population, probability, quartiles, random, range, relative frequency, sample, sample space, simple event, simple random sample, simulation, statistics, stratified random sample, systematic random sample, theoretical probability, third quartile, tree diagram, unbiased sample, uniform probability model, visual overlap, voluntary response sample

Technology

- Random Number Generator on computer
- Video tutors
- Lessons and videos on Interactive White Board

Recommended Instructional Activities:
Are You Ready? Chapter 10, 10-1, 10-2, 10-3, IQL: Visual Overlap of Data Distributions, 10-4, 21st Century Career in Market Research, 10-5, IQL: Multiple Samples of Data, 10-6, IQL: Relative Frequency and Probability, 10-7, 10-8, IQL: Simulate Compound Events

Extension Strategies/Activities:

- HOT Problems
- Extended Response Tests

Modification Strategies/Activities:

- Differentiated assignments based on level
- Personal Tutor videos

Technology/21st Century/Cross-curricular Connections:

Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

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Suggested Assessments:
Performance Task:

- Pretests
- Mid-chapter quiz for chapter 10 (teacher-created)
- Chapter test for Chapter 10

Other Assessment Evidence:

- Student Journal and Portfolio

Theme/Unit: **Proportionality and Linear Relationships**	**Suggested Sequence:**

NJSLS:

7.RP.A.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.

7.RP.A.2 Recognize and represent proportional relationships between quantities.

7.RP.A.2a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

7.RP.A.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

7.RP.A.2c Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.

7.RP.A.2d Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.

7.RP.A.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error

7.EE.A.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

7.EE.A.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that “increase by 5%” is the same as “multiply by 1.05.”

7.EE.B.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you

want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

7.EE.B.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

7.EE.B.4a Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

7.EE.B.4b Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific. rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions

7.NS.A.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

7.NS.A.2c Apply properties of operations as strategies to multiply and divide rational numbers.

7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale

Essential Questions:

- How can you identify and represent proportional relationships?

Knowledge, Skills, and Instructional Objectives:

- Write ratios as fractions in simplest form and simplify ratios involving measurements
- Find, compare and use unit rates
- Simplify complex fractions
- Convert rates using dimensional analysis
- Convert between systems of measurement
- Identify proportional and nonproportional relationships in tables and graphs
- Describe a proportional relationship using an equation
- Identify and analyze proportional relationships
- Use cross products and the constant of proportionality to solve problems
- Use and construct scale drawings
- Use scale factor to draw enlargements and reductions
- Find missing measures of similar figures
- Use scale factors to solve problems involving similar figures
- Solve problems involving indirect measurement using shadow reckoning
- Solve problems using surveying methods
- Use and apply the percent proportion to solve problems
- Compute mentally and estimate with percents
- Solve percent problems and problems involving taxes using percent equations
- Find percent of increase, decrease and percent error
- Solve real-world problems involving discount and markup
- Solve simple and compound interest problems
- Apply the simple interest equation to real-world problems
- Use the Distributive Property to write equivalent numerical and algebraic expressions

- Identify parts of an algebraic expression and use the Distributive Property to simplify algebraic expressions
- Add linear expressions and find perimeter by adding linear expressions
- Subtract linear expressions
- Solve real-world problems by subtracting linear expressions
- Find the greatest common factor of two monomials
- Use properties to factor linear expressions
- Solve problems by using the Division and Multiplication Properties of Equality
- Solve two-step equations
- Solve real-world problems involving two-step equations
- Write two-step equations
- Solve verbal problems by writing and solving two-step equations
- Solve equations of the form p(x+q)=r
- Solve equations with variables on each side
- Write inequalities
- Graph inequalities on a number line
- Solve inequalities by using the Addition and Subtraction Properties of Inequality
- Solve inequalities by multiplying or dividing by a positive or negative number
- Solve multi-step equations
- Solve multi-step inequalities
- Determine whether a relation is a function and write a function using function notation
- Solve linear equations with two variables and graph linear equations using ordered pairs
- Find the constant rate of change for a linear relationship and find the slope of a line
- Graph and analyze slope triangles
- Identify and use direct variation
- Determine slopes and y-intercepts of lines and use them to graph linear equations

Instructional Materials/Resources:
Grid paper, algebra tiles,

Suggested Vocabulary:
Complex fraction, congruent, constant of proportionality, corresponding parts, cross products, dimensional analysis, indirect measurement, nonproportional, proportion, proportional, rate, ratio, scale, scale drawing, scale factor, scale model, similar figures, unit rate, compound interest, discount, interest, markup, percent equation, percent error, percent of change, percent of decrease, percent of increase, percent proportion, principal, selling price, simple interest, coefficient, constant, Distributive Property, equivalent expressions, factor, factored form, like terms, linear expression, simplest form, simplifying the expression, term, constant of variation, constant rate of change, direct variation, function, function notation, function rule, function table, dependent variable, independent variable, linear equation, linear relationship, rate of change, slope, slope-intercept form, substitution, system of equations, vertical line test, x-intercept, y-intercept

Technology:
- Video tutors

	• Lessons and videos on Interactive White Board

Recommended Instructional Activities:
Are You Ready? Chapter 5, 5-1, 5-2, 5-3, 5-4, 5-5, 21st Century Career in Engineering, 5-6, 5-7, 5-8, IQL: Similar Figures, 5-9, 5-10, Are You Ready? Chapter 6, 6-1, 6-2, 6-3, 21st Century Career in Video Game Design, 6-4, 6-5, 6-6, Are You Ready? Chapter 7, 7-1, 7-2, 7-3, 21st Century Career in Design Engineering, 7-4, 7-5, Are You Ready? Chapter 8, 8-1, 8-2, 8-3, 8-4, 21st Century Career in Veterinary Medicine, 8-5, 8-6, 8-7, 8-8, Are You Ready? Chapter 9, 9-1, 9-2, 9-3, IQL: Slope Triangles, 9-4, 21st Century Career in Music, 9-5, 9-6, 9-7

Extension Strategies/Activities:
- IQL: Compound Interest
- HOT Problems
- Extended Response Tests

Modification Strategies/Activities:
- IQL: Percent Models
- IQL: Percent of Change
- IQL: Simplifying Algebraic Expressions
- IQL: Factoring Linear Expressions
- IQL: Solving Two-step Equations
- IQL: More Two-step Equations
- IQL: Solve Equations with Variables on Both Sides

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments:
Performance Task:
- Pretests
- Mid-chapter quizzes for chapters 5, 6, 7, 8 and 9 (teacher-created)
- Chapter tests for Chapters 5, 6, 7, 8 and 9
- Unit Test

Other Assessment Evidence:
- Student Journal and Portfolio

Theme/Unit: **Rational Numbers and Exponents**	**Suggested Sequence:**

NJSLS:

7.NS.A.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

7.NS.A.1d Apply properties of operations as strategies to add and subtract rational numbers.

7.NS.A.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

7.NS.A.2a Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

7.NS.A.2c Apply properties of operations as strategies to multiply and divide rational numbers.

7.NS.A.2d Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.

7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

7.EE.A.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational

coefficients.

7.EE.A.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."

7.EE.B.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of. answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation

7.EE.B.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities

Essential Questions:

- How can you use numbers and symbols to represent mathematical ideas

Knowledge, Skills, and Instructional Objectives:

- Use the four step plan to solve problems
- Translate verbal phrases into numerical expressions
- Use the order of operations to evaluate expressions
- Determine rules for a given pattern
- Translate verbal phrases into algebraic expressions
- Evaluate expressions containing variables
- Identify and use properties of addition and multiplication
- Select appropriate problem-solving strategies to solve nonroutine problems
- Use ordered pairs to locate points
- Use graphs to represent relations
- Translate among different verbal, tabular, graphical, and algebraic representations of relations
- Compare and order integers
- Find the absolute value of an expression
- Add integers
- Subtract integers
- Find distances on the number line
- Multiply integers
- Simplify algebraic expressions
- Divide integers
- Find the mean of a set of data
- Graph points on a coordinate plane
- Graph algebraic relationships
- Write fractions as termination or repeating decimals
- Compare fractions and decimals
- Write rational numbers as fractions
- Identify and classify rational numbers
- Multiply positive and negative fractions
- Evaluate algebraic expressions with fractions
- Divide positive, negative and algebraic fractions
- Add and subtract rational numbers with common denominators

- Add and subtract unlike fractions

Instructional Materials/Resources:	**Suggested Vocabulary:**
Algebra tiles, integer mats	Algebra, algebraic expression, coordinate plane, coordinate system, counterexample, deductive reasoning, defining a variable, domain, equation, evaluate, four-step plan, graph, guess check and revise, look for a pattern, make a table, numerical expression, order of operations, ordered pair, origin, properties, range, relation, simplify, variable, work backward, x-axis, x-coordinate, y-axis, y-coordinate, absolute value, additive inverse, coordinate, inductive reasoning, inequality, integer, negative number, opposites, positive number, quadrant, zero pair, bar notation, like fractions, multiplicative inverse, rational number, reciprocal, repeating decimal, terminating decimal, unlike fractions
	Technology: • Video tutors • Lessons and videos on Interactive White Board

Recommended Instructional Activities:
Are You Ready? Chapter 1, 1-1, 1-2, IQL: Rules and Expressions, 1-3, 1-4, 21st Century Career in Animal Conservation, 1-5, 1-6, 1-7, Are You Ready? Chapter 2, 2-1, 2-2, 2-3, 21st Century Career in Astronomy, 2-4, 2-5, 2-6, Are You Ready? Chapter 3, 3-1, 3-2, 3-3, 21st Century Career in Fashion Design, 3-4, 3-5, 3-6

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• HOT Problems • Extended Response Tests	• IQL: Adding Integers • IQL: Subtracting Integers • IQL: Multiplying Integers • IQL: Fractions and Decimals on the Number Line

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
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Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments:

Performance Task:

- Pretests
- Mid-chapter quizzes for chapters 1, 2, and 3 (teacher-created)
- Chapter tests for Chapters 1, 2, and 3
- Unit Test

Other Assessment Evidence:

- Student Journal and Portfolio

8th Grade

Theme/Unit: **Expressions & Equations**	**Suggested Sequence:**

NJSLS:

8.EE.B.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

8.EE.B.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.

Big Ideas:

- Understand the connections between proportional relationships, lines, and linear equations.

Essential Questions:

- Why are graphs helpful?
- How can you determine congruence and similarity?

Knowledge, Skills, and Instructional Objectives:

- Identify proportional and non-proportional linear relationships by finding a constant rate of change.
- Use a graphing calculator to find rates of change.
- Find the slope of a line.
- Use direct variation to solve problems.
- Graph and analyze slope triangles.
- Graph linear equations using the slope and y-intercept.
- Relate slope of a line to similar triangles.

Instructional Materials/Resources:

Graph paper

Suggested Vocabulary:

Linear relationship, constant rate of change, slope, rise, run, direct variation, constant of variation, constant of proportionality, y-intercept

Technology/21st Century/Cross-curricular Connections:

Technology:

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8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:

CRP1. Act as a responsible and contributing citizen and employee.

	CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
Are you Ready? (pre-requisite skills)
Chapter 3: Lesson 1, Lesson 2, Lesson 3, Lesson 4, Inquiry Lab
Chapter 7: Lesson 7.6

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Projects for beyond level learners (teacher made) • HOT Problems • Extended Response Test	• Differentiated Assignments based on level • Personal Tutor Video

Suggested Assessments:
Performance Task:
Pre-Test (made by teacher)
Quiz on 3-1 & 3-2
Quiz on 3-3 & 3-4
Quiz on 7-6
Post-Test (made by teacher
Other Assessment Evidence:
Student Journal & Portfolio

Theme/Unit: **Expressions & Equations**	**Suggested Sequence:**
NJSLS: 8.EE.C.7a Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers). 8.EE.C.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. 8.EE.C.8 Analyze and solve pairs of simultaneous linear equations.	
Big Ideas: • Analyze and solve linear equations and pairs of simultaneous linear equations	
Essential Questions: • How can you communicate mathematical ideas effectively? • What is equivalence?	
Knowledge, Skills, and Instructional Objectives: • Solve equations with rational coefficients. • Use a bar diagram to write and solve two-step equations. • Solve two-step equations. • Write two-step equations that represent real-world situations. • Solve problems by working backward. • Solve equations with variables on each side. • Solve multi-step equations. • Graph a function using the x- and y-intercepts. • Write an equation for a line. • Find one solution for a set of two equations. • Solve systems of equations by graphing. • Solve systems of equations algebraically. • Solve real-world mathematical problems using two linear equations in two variables.	
Instructional Materials/Resources: • Algebra tiles, equation mats (Chapter 2: Lesson 2 & 4)	**Suggested Vocabulary:** Multiplicative inverse, coefficient, properties, two-step equation, variable, null set, identity, x-intercept, standard form, point-slope form, systems of equations, substitution
	Technology/21st Century/Cross-curricular Connections: **Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an

	understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
Are you Ready? (pre-requisite skills)
Chapter 2: Lesson 1, Inquiry Lab 2-2, Lesson 2, Lesson 3, Lesson 4, Lesson 5
Ch 2 PSI
21st Century Career: Skateboard Designer
Chapter 3: Lesson 5, Lesson 6, Lesson 7, Lesson 8
Ch 3 PSI
21st Century Career: Mastering Engineer
Unit Project: Web Design 10

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• HOT Problems • Extended Response Test	• Differentiated Assignments based on level • Personal Tutor Video • Inquiry Lab 2-4 (Solving equations with variables on each side using algebra tiles)

Cross-curricular Connections/Standards:
Career Projects

Suggested Assessments:
Performance Task:
Pre-Test (made by teacher)
Quiz on 2-1 & 2-2
Quiz on 2-3 & 2-4
Quiz on 2-5

Post-Test (made by teacher)
Pre-Test (made by teacher)
Quiz on 3-5 & 3-6
Quiz on 3-7 & 3-8
Post-Test (made by teacher)
Unit Test

Other Assessment Evidence:
Student Journal
Portfolio (student work and career projects)

Theme/Unit: **Expressions & Equations**	**Suggested Sequence:**

NJSLS:

8.EE.A.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $32 \times 3^{-5} = 3^{-3} = 1/33 = 1/27$.

8.EE.A.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational

8.EE.A.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the. population of the United States as 3 times 108 and the population of the world as 7 times 109, and determine that the world population is more than 20 times larger

8.EE.A.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology

Big Ideas:

- Work with Radicals and Integer Exponents

Essential Questions:

- Why is it helpful to write numbers in different ways?

Knowledge, Skills, and Instructional Objectives:

- Use powers and exponents to write large and small numbers.
- Simplify real number expressions by multiplying and dividing monomials.
- Use laws of exponents to find powers of monomials.
- Solve problems by using the four-step plan.
- Write and evaluate expressions using negative exponents.
- Use scientific notation to write large numbers and small numbers.
- Compute with numbers written in scientific notation.
- Interpret scientific notation when using technology.
- Find square roots and cube roots.

Instructional Materials/Resources:

- Index cards (Lesson 6)
- Math tiles (Lesson 8)

Suggested Vocabulary:
Power, base, exponent, monomial, scientific notation, Square root, perfect square, radical sign, cube root, perfect cube

Technology/21st Century/Cross-curricular Connections:
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Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of

	problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
Are you Ready? (pre-requisite skills)
Chapter 1: Lesson 2, Lesson 3, Lesson 4, Lesson 5, Lesson 6, Inquiry Lab 7, Lesson 7, Lesson 8
21st Century Career: Robotics Engineer

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Unit Project (Music to My Ears) • HOT Problems • Extended Response Test (#2)	• Differentiated Assignments based on level • Personal Tutor Video

Cross-curricular Connections/Standards:
Lesson 5 (size of atoms, mass of molecules)
Lesson 6 (plant cell, name things that can be measured in nanometers, mass of elements)
Lesson 7 (neurons)
Inquiry Lab (solar system)

Suggested Assessments:
Performance Task:
Pre-Test (made by teacher)
Quiz on 1-2 & 1-3
Quiz on 1-4 & 1-5
Quiz on 1-6 & 1-7
Quiz on 1-8
Post-Test (made by teacher)
Other Assessment Evidence:
Student Journal
Portfolio (student work and career projects)

Theme/Unit: **Expressions & Equations**	**Suggested Sequence:**
NJSLS: 8.F.A.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. 8.F.A.2 Compare properties (e.g., rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change. 8.F.A.3 Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A = s2 giving the area of a square as a function of its side. length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line 8.F.B.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a. table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values 8.F.B.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally	
Big Ideas: • Define, evaluate, and compare functions. • Use functions to model relationships between quantities.	
Essential Questions: • How can we model relationships between quantities?	
Knowledge, Skills, and Instructional Objectives: • Translate tables and graphs into linear equations. • Use the coordinate plane to represent relations. • Determine whether a relation is a function. • Find function values and complete function tables. • Represent linear functions using function tables and graphs and determine whether a set of data is continuous or	

discrete.
- Solve problems by making a table.
- Compare properties of functions.
- Determine and interpret the rate of change and the initial value of a function.
- Determine whether a function is linear or nonlinear.
- Graph quadratic functions.
- Use a graphing calculator to graph families of nonlinear functions.
- Sketch and describe qualitative graphs.

Instructional Materials/Resources:
Graph paper

Suggested Vocabulary:
Linear equation, relation, domain, range, function, function table, independent variable, dependent variable, linear function, continuous function, discrete function, quadratic function, qualitative graphs

Technology/21st Century/Cross-curricular Connections:
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Career Ready Practices:
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CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
Are you Ready? (pre-requisite skills)
Chapter 4: Lesson 1, Inquiry Lab 2-2, Lesson 2, Lesson 3, Lesson 4, Lesson 5, Lesson 6, Lesson 7, Lesson 8, Lesson 9
Ch 4 PSI
21st Century Career: Physical Therapist
Unit Project: Green Thumb

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• HOT Problems • Extended Response Test	• Differentiated Assignments based on level • Personal Tutor Video

Cross-curricular Connections/Standards:
Career Projects, Unit Project

Suggested Assessments:
Performance Task:
Pre-Test (made by teacher)
Quiz on 4-1 & 4-2
Quiz on 4-3 & 4-4
Quiz on 4-5 & 4-6
Quiz on 4-7 & 4-8
Quiz on 4-9
Post-Test (made by teacher)
Other Assessment Evidence:
Student Journal
Portfolio (student work and career projects)

Theme/Unit: **Geometry**	**Suggested Sequence:**

NJSLS:

8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations:
a. Lines are transformed to lines and line segments to line segments of the same length
b. Angles are transformed to angles of the same measure
c. Parallel lines are transformed to parallel lines

8.G.A.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

8.G.A.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

8.G.A.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.

Big Ideas:

- Understand congruence and similarity using physical models, transparencies, or geometry software.

Essential Questions:

- How can we best show or describe the change in position of a figure.
- How can you determine congruence and similarity?

Knowledge, Skills, and Instructional Objectives:

- Identify and apply flips, slides, and turns.
- Graph translations on the coordinate plane.
- Graph reflections on the coordinate plane.
- Identify rotational symmetry.
- Graph rotations on the coordinate plane.
- Identify dilations.
- Use scale factor to graph dilations.
- Use a series of transformations to create congruent figures.
- Write congruence statements for congruent figures.
- Use transformations to create similar figures.
- Identify similar polygons and find missing measures of similar polygons.
- Solve problems involving similar triangles.
- Find the relationship between perimeters and areas of similar figures.
- Examine angle relationships formed by parallel lines and a transversal.
- Identify relationships of angles formed by two parallel lines cut by a transversal.
- Find missing angle measures in triangles.
- Find the sum of the angle measures of a polygon and the measure of one interior angle of a regular polygon.

Instructional Materials/Resources:	**Suggested Vocabulary:**
Tracing paper, straightedge, protractor (IQL 6-1) Ruler (IQL 6-4) Patty Paper (IQL 7-2)	Transformation, pre-image, image, translation, congruent, reflection, line of reflection, rotation, center of rotation, dilation, composition of

Rulers & Protractors (IQL 7-3) Protractor (IQL 5-1) Protractor (Lesson 5-3)	transformations, corresponding parts, similar, fractal, similar polygons, scale factor, indirect measurement, perpendicular lines, parallel lines, transversal, interior angles, exterior angles, alternate interior angles, alternate exterior angles, corresponding angles, triangle, interior angle, exterior angle, remote interior angles, polygon, equiangular, regular polygon
	Technology/21st Century/Cross-curricular Connections: **Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
Are you Ready? (pre-requisite skills) Ch 6
Chapter 6: Lesson 1, Lesson 2, Lesson 3, Lesson 4
Ch 6 PSI
21st Century Career: Computer Animator

Are you Ready? (pre-requisite skills) Ch 7
Chapter 7: Lesson 1, Lesson 2, IQL 7-3, Lesson 3, Lesson 4, Lesson 5, Lesson 7
Ch 7 PSI
21st Century Career: Car Designer
Ch 5: IQL 5-1, Lesson 1, IQL 5-3, Lesson 3, Lesson 4
Ch 5 PSI

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• HOT Problems • Extended Response Test	• Differentiated Assignments based on level • Personal Tutor Video • Inquiry Lab 6-1, 6-3, 6-4 • Inquiry Lab 7-1, 7-2

Cross-curricular Connections/Standards:
Career Project

Suggested Assessments:
Performance Task:
Pre-Test (made by teacher)
Quiz on 6-1 & 6-2
Quiz on 6-3 & 6-4
Post-Test (made by teacher)
Pre-Test (made by teacher)
Quiz on 7-1 & 7-2
Quiz on 7-3 & 7-4
Quiz on 7-5 & 7-7
Post-Test (made by teacher)
Pre-Test (made by teacher)
Quiz on 5-1
Quiz on 5-3 & 5-4
Post-Test (made by teacher)

Other Assessment Evidence:
Student Journal
Portfolio (student work and career projects)

Theme/Unit: **Geometry**	**Suggested Sequence:**

NJSLS:
8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse.
8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Big Ideas:
- Understand and Apply the Pythagorean Theorem

Essential Questions:
- How can algebraic concepts be applied to geometry?

Knowledge, Skills, and Instructional Objectives:

- Write geometric proofs.
- Find the relationship among the sides of a right triangle.
- Use the Pythagorean Theorem.
- Prove the Pythagorean Theorem and its converse.
- Solve problems using the Pythagorean Theorem.
- Find the distance between two points on the coordinate plane.

Instructional Materials/Resources:

Prepare copies of a right triangle (8 per student) IQL 5-6

Suggested Vocabulary:

Inductive reasoning, deductive reasoning, proof, paragraph proof, informal proof, two-column proof, formal proof, theorem, legs, hypotenuse, Pythagorean Theorem, converse, distance formula

Technology/21st Century/Cross-curricular Connections:

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Career Ready Practices:

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
Are you Ready? (pre-requisite skills) Ch 5
Chapter 5: Lesson 2, IQL 5-5, Lesson 5, IQL 5-6, Lesson 6, Lesson 7
21st Century Career: Travel Agent

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• HOT Problems • Extended Response Test	• Differentiated Assignments based on level • Personal Tutor Video

Cross-curricular Connections/Standards:
Career Project

Suggested Assessments:
Performance Task:
Pre-Test (made by teacher)
Quiz on 5-2 & 5-5
Quiz on 5-6 & 5-7
Post-Test (made by teacher)
Other Assessment Evidence:
Student Journal
Portfolio (student work and career projects)

Theme/Unit: **Geometry**	**Suggested Sequence:**

NJSLS:
8.G.C..9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Big Ideas:
- Solve Real-World and Mathematical Problems Involving Volume of Cylinders, Cones, and Spheres.

Essential Questions:
- Why are formulas important in math and science?

Knowledge, Skills, and Instructional Objectives:
- Determine how some three-dimensional figures are related to circles.
- Find the volume of cylinders.
- Find the volume of cones.
- Find the volume of spheres.
- Find the surface area of cylinders.
- Find the surface area of cones.
- Determine how changes in dimensions affect area and volume.
- Solve problems involving similar solids.

Instructional Materials/Resources:	**Suggested Vocabulary:**
• Cylinder • Cone • sphere	Volume, cylinder, composite solids, cone, sphere, hemisphere, lateral area, total surface area, similar solids
	Technology/21st Century/Cross-curricular Connections:

	Technology: 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
Are you Ready? (pre-requisite skills) Ch 8
Chapter 8: IQL 8-1, Lesson 1, Lesson 2, Lesson 3, Lesson 4, Lesson 5, IQL 8-6, Lesson 6
8 PSI
21st Century Career: Space Architect
Unit Project

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• HOT Problems • Extended Response Test • IQL 8-5	• Differentiated Assignments based on level • Personal Tutor Video • IQL 8-4

Cross-curricular Connections/Standards:
Career Project

Suggested Assessments:

Performance Task:
Pre-Test (made by teacher)
Quiz on 8-1 & 8-2
Quiz on 8-3 & 8-4
Quiz on 8-5 & 8-6
Post-Test (made by teacher)

Other Assessment Evidence:
Student Journal
Portfolio (student work and career projects)

Theme/Unit: **The Number System**	**Suggested Sequence:**

NJSLS:

8.NS.A.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

8.NS.A.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π2). For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.

Essential Questions:

- Why is it helpful to write numbers in different ways?

Knowledge, Skills, and Instructional Objectives:

- Write rational numbers as decimals and decimals as fractions.
- Estimate square roots of non-perfect squares.
- Use roots to estimate solutions.

Instructional Materials/Resources:	**Suggested Vocabulary:**
• Index cards • Dot paper	Rational number, repeating decimal, terminating decimal, ratio, inequality, radical
	Technology/21st Century/Cross-curricular Connections: **Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society,

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Recommended Instructional Activities:
Are you Ready? (pre-requisite skills)
Chapter 1: Lesson 1, Inquiry Lab 9, Lesson 9, Lesson 10

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Projects for beyond level learners (teacher made) • HOT Problems • Extended Response Test (#1 & 3)	• Differentiated Assignments based on level • Personal Tutor Video

Cross-curricular Connections/Standards:
- Lesson 9 (Newton – Gravity)

Suggested Assessments:
Performance Task:
Pre-Test (made by teacher)
Quiz on 1-1 and 1-9
Quiz on 1-10
Post-Test (made by teacher)
Other Assessment Evidence:
Student Journal & Portfolio

Theme/Unit: **Statistics and Probability**	**Suggested Sequence:**

NJSLS:
8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between

.	two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association
8.SP.A.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (e.g., line of best fit) by judging the closeness of the data points to the line
8.SP.A.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.
8.SP.A.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?

Big Ideas:

- Investigate Patterns of Association with Bivariate Data

Essential Questions:

- How are patterns used when comparing two quantities?

Knowledge, Skills, and Instructional Objectives:

- Use a scatter plot to investigate the relationship between two sets of data.
- Construct and make conjectures about scatter plots.
- Use models to make predictions.
- Draw lines of best fit and use them to make predictions about data.
- Use technology to describe associations in scatter plots.
- Construct and Interpret two-way tables.
- Find measures of center and variation.
- Find and interpret the mean absolute deviation for a data.

Instructional Materials/Resources:

Meter stick (IQL 9-1)
Uncooked spaghetti (IQL 9-2)

Suggested Vocabulary:

Bivariate data, scatter plot, line of best fit, relative frequency, two-way table, univariate data, qualitative data, five-number summary

Technology/21st Century/Cross-curricular Connections:

Technology:

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Recommended Instructional Activities:
Are you Ready? (pre-requisite skills) Ch 9
Chapter 9: IQL 9-1, Lesson 1, IQL 9-2, Lesson 2, Lesson 3, Lesson 4, 9 PSI
21st Century Career: Sports Marketer
Unit Project

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• HOT Problems • Extended Response Test • Lesson 9-5 and Lesson 9-6	• Differentiated Assignments based on level • Personal Tutor Video

Cross-curricular Connections/Standards:
Career Project

Suggested Assessments:
Performance Task:
Pre-Test (made by teacher)
Quiz on 9-1 & 9-2
Quiz on 9-3 & 9-4
Post-Test (made by teacher)
Other Assessment Evidence
Student Journal
Portfolio (student work and career projects)

Algebra

Theme/Unit: **Relationships between Quantities**	**Suggested Sequence:** **1st Unit (September)**

NJSLS:

SSE.A.1a	Interpret parts of an expression, such as terms, factors, and coefficients.
SSE.A.1b	Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)n as the product of P and a factor not depending on P.
SSE.A.2	Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).
CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions
REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method
REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
REI.D.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph

	equations on coordinate axes with labels and scales.
CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R
8.F.A.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output

Big Ideas:

- Why is learning mathematics important?

Essential Questions:

- How can mathematical ideas be represented?
- Why is it helpful to represent the same mathematical idea in different ways?

Knowledge, Skills, and Instructional Objectives:

- Write verbal expressions for algebraic expressions.
- Write algebraic expressions for verbal expressions.
- Evaluate numerical expressions by using the order of operations.
- Evaluate algebraic expressions by using the order of operations.
- Recognize the properties of equality and identity.
- Recognize the Commutative and Associative Properties.
- Use the distributive property to evaluate expressions.
- Use the distributive property to simplify expressions.
- Solve equations with one variable.
- Solve equations with two variables.
- Determine whether a relation is a function.
- Find function values.
- Represent relations,
- Interpret graphs of relations.
- Use technology to represent a function as a table and a graph.
- Translate sentences into equations.
- Translate equations into sentences.
- Solve equations by using addition or subtraction.
- Solve equations by using multiplication and division.
- Solve equations involving more than one operation.
- Solve equations involving consecutive integers.
- Solve equations with the variable on one side.
- Solve equations involving grouping symbols.
- Evaluate absolute value expressions.
- Solve absolute value equations.
- Compare ratios.
- Solve proportions.
- Find the percent of change.
- Solve problems involving percent of change.
- Solve equations for given variables.
- Use formulas to solve real-world problems.
- Solve mixture problems.
- Solve uniform motion problems.

Instructional Materials/Resources:	**Suggested Vocabulary:**
eStudent Edition	Ch 1: Algebraic expressions, variable, term, factor, product, power,

eTeacher Edition Interactive Classroom Leveled Worksheets Personal Tutor Self-Check Quiz Algebra Tiles (Explore 2-2 and 2-3)	exponent, base, evaluate, order of operations, equivalent expressions, additive identity, multiplicative identity, multiplicative inverse, reciprocal, like terms, simplest form, coefficient, open sentence, equation, solving, solution, replacement set, set, element, solution set, identity, coordinate system, coordinate plane, x-and y-axes, origin, ordered pair, x- and y-coordinates, relation, mapping, domain, range, independent variable, dependent variable, function, discrete function, continuous function, vertical line test, function notation, nonlinear function Ch 2: formula, solve an equation, equivalent equations, multi-step equation, consecutive integers, number theory, identity, ratio, proportion, means, extremes, rate, unit rate, scale, scale model, percent of change, percent of increase, percent of decrease, literal equation, dimensional analysis, unit analysis, weighted average, mixture problem, uniform motion problem, rate problem

Recommended Instructional Activities:
Getting Ready for the Chapter (Ch 1)
Lesson 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7
Mid-Chapter Quiz
Study Guide & Review
Practice Test
Getting Ready for the Chapter (Ch 2)
Lesson 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, 2-9
Mid-Chapter Quiz
Study Guide & Review
Practice Test

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Enrichment Worksheets • HOT problems	• Study Guide & Intervention Worksheets • Pair with student mentor • Skills Review • Personal Tutor (Glencoe) • Explore 2-2, 2-3

Technology/21st Century/Cross-curricular Connections:
Technology:
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Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments:
Performance Task:
Pre-Test (Ch 1)
Quiz 1.1 – 1.2
Quiz 1.3 - 1.4
Quiz 1.5 - 1.6
Quiz 1.7
Mid-Chapter Quiz (Formative Assessment)
Post-Test (Ch 1)
Pre-Test (Ch 2)
Quiz 2.1 – 2.3
Quiz 2.4 – 2.5
Quiz 2.6 - 2.7
Quiz 2.8 – 2.9
Mid-Chapter Quiz (Formative Assessment)
Post-Test (Ch 2)
Other Assessment Evidence:
Student Journal & Portfolio

Theme/Unit: **Linear Relationships**	**Suggested Sequence:** **2nd Unit (Nov – Jan)**
NJSLS:	

REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
REI.C.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables
REI.D.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
REI.D.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes
CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
8.EE.B.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
8.EE.B.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.
8.EE.C.8	Analyze and solve pairs of simultaneous linear equations.
8.EE.C.8c	Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.
8.F.A.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.
8.F.A.3	Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A = s2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line
8.F.B.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Big Ideas:

- Why is learning mathematics important?

Essential Questions:

- Why are graphs useful?
- Why is math useful to model real-world situations?
- How are symbols useful in mathematics?
- What mathematical symbols do you know?
- How can you find the solution to a math problem?

Knowledge, Skills, and Instructional Objectives:

- Identify linear equations, interecepts, and zeros.
- Graph linear equations.

- Solve linear equations by graphing.
- Estimate solutions to an equation by graphing.
- Use rate of change to solve problems.
- Find the slope of a line.
- Write and graph direct variation equations.
- Solve problems involving direct variation.
- Write an equation for a proportional relationship.
- Write an equation for anonproportional relationship.
- Find the inverse of a relation.
- Find the inverse of a linear function.
- Write and graph linear equations in slope-intercept form.
- Model real-world data with equations in slope-intercept form.
- Write an equation of a line in slope-intercept form given the slope and one point.
- Write an equation of a line in slope-intercept form given two points.
- Write an equation of lines in point-slope form.
- Write linear equations in different forms.
- Write an equation of the line that passes through a given point, parallel to a given line.
- Write an equation of the line that passes through a given point, perpendicular to a given line.
- Investigate relationships between quantities by using points on scatter plots.
- Use lines of best fit to make and evaluate predictions.
- Solve linear inequalities by using addition and subtraction.
- Solve linear inequalities by using multiplication and division.
- Solve linear inequalities involving more than one operation.
- Solve linear inequalities involving the distributive property.
- Identify compound statements connected by the word *and* or *or* as true or false.
- Solve compound inequalities containing the word *and* and graph their solution set.
- Solve compound inequalities containing the word *or* and graph their solution set.
- Solve and graph absolute value inequalities (<) and (>).
- Graph linear inequalities on the coordinate plane.
- Solve inequalities by graphing.
- Use a graphing calculator to investigate the graphs of inequalities.
- Determine the number of solutions a system of linear equations has, if any.
- Solve systems of linear equations by graphing.
- Use a graphing calculator to solve a system of equations.
- Solve systems of equation by using substitution.
- Solve real-world problems involving systems of equation sby using substitution.
- Solve systems of equations by using elimination with addition.
- Solve systems of equations by using elimination with subtraction.
- Solve systems of equations by using elimination with multiplication.
- Solve real-world problems involving systems of equations.
- Determine the best method for solving systems of equations.
- Apply systems of equations.
- Solve systems of linear inequalities by graphing.
- Apply systems of linear inequalities.

Instructional Materials/Resources:	**Suggested Vocabulary:**
eStudent Edition	Ch 3: linear equation, standard form, constant, x-

eTeacher Edition Interactive Classroom Leveled Worksheets Personal Tutor Self-Check Quiz Algebra Tiles (Explore 5-2) Graphing Calculators (Extend 5-6, Extend 6-1, Extend 6-5)	intercept, y-intercept, linear function, parent function, family of graphs, root, zeros, rate of change, slope, direct variation, constant of variation, constant of proportionality Ch 4: slope-intercept form, constant form, constraint, linear extrapolation, point-slope form, parallel lines, perpendicular lines, bivariate data, scatter plot, line of fit, lineat interpolation, inverse relation, inverse function Ch 5: set-builder notation, compound inequality, intersection, union, boundary, half-plane, closed(open) half-plane Ch 6: system of equations, consistent, independent, dependent, inconsistent, substitution, elimination, system of inequalities

Recommended Instructional Activities:
Getting Ready for the Chapter (Ch 3)
Lesson 3-1, 3-2, 3-3, 3-4, 3-6
Getting Ready for the Chapter (Ch 4)
Lesson 4-1, 4-2, 4-3, 4-4, 4-5, 4-7
Getting Ready for the Chapter (Ch 5)
Lesson 5-1, Explore 5-2, 5-2, 5-3, Explore 5-4, 5-4, 5-5, 5-6, Extend 5-6
Getting Ready for the Chapter (Ch 6)
Lesson 6-1, Extend 6-1, 6-2, 6-3, 6-4, 6-5, Extend 6-5, 6-6, Extend 6-6

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Enrichment Worksheets • HOT problems	• Study Guide & Intervention Worksheets • Pair with student mentor • Skills Review • Personal Tutor (Glencoe)

Technology/21st Century/Cross-curricular Connections:
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CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

Suggested Assessments:
Performance Task:
Pre-Test (Ch 3)
Quiz 3.1-3.2
Quiz 3.3-3.4
Quiz 3-6
Post-Test (Ch 3)
Pre-Test (Ch 4)
Quiz 4.1-4.2
Quiz 4.3-4.4
Quiz 4.5-4.6
Quiz 4.7
Post-Test (Ch 4)
Pre-Test (Ch 5)
Quiz 5.1-5.3
Mid-Chapter Quiz (5.1-5.3)
Quiz 5.4-5.5
Quiz 5.6
Post-Test (Ch 5)
Pre-Test (Ch 6)
Quiz 6.1
Quiz 6.2 -6.4
Mid-Chapter Quiz (6.1-6.4)
Quiz 6.5 & 6.6
Post-Test (Ch 6)
Other Assessment Evidence:
Student Journal & Portfolio

Theme/Unit: **Exponential & Quadratic Relationships**	**Suggested Sequence:**

NJSLS:

SSE.A.1a	Interpret parts of an expression, such as terms, factors, and coefficients.
SSE.A.2	Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).
SSE.B.3a	Factor a quadratic expression to reveal the zeros of the function it defines.
SSE.B.3b	Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
SSE.B.3c	Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be rewritten as (1.151/12)12t ≈ 1.01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%
REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
REI.B.4	Solve quadratic equations in one variable.
REI.B.4b	Solve quadratic equations by inspection (e.g., for x2 = 49), taking square roots, completing the square, the. quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b
REI.D.11	Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.
APR.A.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
8.F.A.3	Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A = s2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.
8.F.B.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Big Ideas:

- Why is learning mathematics important?

Essential Questions:

- How can you make good decisions?
- What factors can affect good decision making?

- When could a nonlinear function be used to model a real-world situation?

Knowledge, Skills, and Instructional Objectives:

- Multiply monomials using the properties of exponents.
- Simplify expressions using the multiplication properties of exponents.
- Divide monomials using properties of exponents.
- Simplify expressions containing negative and zero exponents.
- Express numbers in scientific notation.
- Find products and quotients of numbers expressed in scientific notation.
- Use a graphing calculator to solve exponential equations and inequalities.
- Use properties of rational exponents to transform expressions for exponential functions into equivalent forms to solve problems.
- Write polynomials in standard form.
- Add and subtract polynomials.
- Multiply a polynomial by a monomial.
- Solve equations involving the products of monomials and polynomials.
- Multiply binomials using the FOIL method.
- Multiply polynomials by using the distributive property.
- Find squares of sums and differences.
- Find the product of a sum and a difference.
- Use the distributive property to factor polynomials.
- Analyze the characteristics of the graphs of quadratic functions.
- Graph quadratic functions.
- Use a given quadratic function to investigate the rate of change of a quadratic function.
- Solve quadratic equations of the form $ax^2 + bx = 0$.
- Factor trinomials of the form $x^2 + bx + c$.
- Solve equations of the form $x^2 + bx + c = 0$.
- Factor trinomials of the form $ax^2 + bx + c$.
- Solve equations of the form $ax^2 + bx + c = 0$.
- Factor binomials that are the difference of squares.
- Use the difference of squares to solve equations.
- Factor perfect square trinomials.
- Solve equations involving perfect squares.
- Solve quadratic equations by graphing.
- Estimate solutions of quadratic equations by graphing.
- Use a graphing calculator to investigate families of quadratic functions.
- Apply translations of quadratic functions.
- Use a graphing calculator to solve a system of one linear and one quadratic equation.
- Complete the square to write perfect square trinomials.
- Solve quadratic equations by completing the square.
- Complete the square in a quadratic expression to find the maximum or minimum value of the related function.
- Solve quadratic equations by using the quadratic formula.
- Use the discriminant to determine the number of solutions to a quadratic equation.

Instructional Materials/Resources:	**Suggested Vocabulary:**
eStudent Edition eTeacher Edition Interactive Classroom	Ch 7: monomial, constant, zero exponent, negative exponent, order of magnitude, scientific notation, compound interest

Leveled Worksheets Personal Tutor Self-Check Quiz Graphing Calculator (Extend 7-5, Extend 7-6) Algebra Tiles (Explore 8-1, 8-3, 8-5, 8-6) Graphing Calculator (Extend 9-2, Explore 9-3, Extend 9-3)	Ch 8: polynomial, binomial, trinomial, degree of a monomial, degree of a polynomial, leading coefficient, FOIL method, quadratic expression, factoring, factoring by grouping, zero product property, quadratic equation, prime polynomial, difference of two squares, perfect square trinomial Ch 9: quadratic function, standard form, parabola, axis of symmetry, vertex, minimum, maximum, double root, transformation, translation, vertex form, completing the square, quadratic formula, discriminant

Recommended Instructional Activities:
Getting Ready for the Chapter (Ch 7)
Lesson 7-1, 7-2, 7-4, Extend 7-5, Extend 7-6
Getting Ready for the Chapter (Ch 8)
Explore 8-1,Lesson 8-1, 8-2, Explore 8-3, 8-3, 8-4, Explore 8-5, 8-5, Explore 8-6, 8-6, 8-7, 8-8, 8-9
Getting Ready for the Chapter (Ch 9)
Lesson 9-1, Extend 9-1, 9-2, Extend 9-2, Explore 9-3, 9-3, Extend 9-3, 9-4, Extend 9-4, 9-5

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Enrichment Worksheets • HOT problems	• Study Guide & Intervention Worksheets • Pair with student mentor • Skills Review • Personal Tutor (Glencoe)

Technology/21st Century/Cross-curricular Connections:
Technology:
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Suggested Assessments:
Performance Task:
Pre-Test (Ch 7)

Quiz 7.1 - 7.2
Quiz 7.4
Quiz on Extensions 7-5 & 7-6
Post-Test (Ch 7)
Pre-Test (Ch 8)
Quiz 8.1 & 8.2
Quiz 8.3 & 8.4
Mid-Chapter Quiz (8.1-8.4)
Quiz 8.5
Quiz 8.6 & 8.7
Quiz 8.8 & 8.9
Post-Test (Ch 8)
Pre-Test (Ch 9)
Quiz 9.1 & 9.2
Quiz 9.3
Quiz 9.4
Mid-Chapter Quiz (9.2-9.4)
Quiz 9.5
Post-Test (Ch 9)

Other Assessment Evidence:
Student Journal & Portfolio

Theme/Unit: **Advanced Functions and Equations**	**Suggested Sequence:**

NJSLS:

REI.B.4a Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p)2 = q that has the same solutions. Derive the quadratic formula from this form.

REI.D.11 Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales

.8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

8.EE.A.2 Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.

Big Ideas:

- Why is learning mathematics important?

Essential Questions:

- How can you choose a model to represent a real-world situation?
- How can simplifying mathematical expressions be useful?

Knowledge, Skills, and Instructional Objectives:

- Simplify radical expressions by using the Product Property of Square Roots.
- Simplify radical expressions by using the Quotient Property of Square Roots.
- Solve radical equations.
- Solve radical equations with extraneous solutions.
- Solve problems by using the Pythagorean Theorem.
- Determine whether a triangle is a right triangle.
- Investigate distances on the coordinate plane.
- Identify and use inverse variations.
- Graph inverse variations.
- Use graphing technology to investigate families of rational functions.
- Identify excluded values.
- Identify and use asymptotes to graph rational functions.
- Identify values excluded from the domain of a rational expression.
- Simplify rational expressions.
- Use a graphing calculator to simplify rational expressions, and verify solutions and excluded values.
- Multiply rational expressions.
- Divide rational expressions.
- Divide a polynomial by a monomial.
- Divide a polynomial by a binomial.
- Add and subtract rational expressions with like denominators.
- Add and subtract rational expressions with unlike denominators.
- Simplify mixed expressions.
- Simplify complex fractions.
- Solve rational equations.
- Use rational equations to solve problems.

Instructional Materials/Resources:

eStudent Edition
eTeacher Edition
Interactive Classroom
Leveled Worksheets
Personal Tutor
Self-Check Quiz

Suggested Vocabulary:

Ch 10: radical expression, hypotenuse, legs, converse, Pythagorean Triple, distance formula, midpoint, rationalizing the denominator, conjugate, radical equations, extraneous solutions
Ch 11: inverse variation, product rule, rational function, excluded value, asymptote, rational expression, least common multiple, lease common denominator, mixed expression, complex fraction, rational equation, extraneous solution, work and rate problems

Recommended Instructional Activities:

Getting Ready for the Chapter (Ch 10)
Lesson 10-2, 10-4, 10-5, Extend 10-5
Getting Ready for the Chapter (Ch 11)
Lesson 11-1, Explore 11-2, 11-2, 11-3, Extend 11-3, 11-4, 11-5, 11-6, 11-7, 11-8

Extension Strategies/Activities:

- Enrichment Worksheets
- HOT problems

Modification Strategies/Activities:

- Study Guide & Intervention Worksheets
- Pair with student mentor
- Skills Review

	• Personal Tutor (Glencoe)

Technology/21st Century/Cross-curricular Connections:
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Career Ready Practices:
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CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
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CRP11. Use technology to enhance productivity.

Suggested Assessments:
Performance Task:
Pre-Test (Ch 10)
Quiz 10.2
Quiz 10.4
Quiz 10.5
Post-Test (Ch 10)
Pre-Test (Ch 11)
Quiz 11.1
Quiz 11.2
Quiz 11.3 & 11.4
Mid-Chapter Quiz (11.1-11.4)
Quiz 11.5 & 11.6
Quiz 11.7 & 11.8
Post-Test (Ch 11)
Other Assessment Evidence:
Student Journal & Portfolio

Theme/Unit: **Geometry**	**Suggested Sequence:**

NJSLS:
8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and

mathematical problems.

Big Ideas:

- Solve Real-World and Mathematical Problems Involving Volume of Cylinders, Cones, and Spheres.

Essential Questions:

- Why are formulas important in math and science?

Knowledge, Skills, and Instructional Objectives:

- Determine how some three-dimensional figures are related to circles.
- Find the volume of cylinders.
- Find the volume of cones.
- Find the volume of spheres.
- Find the surface area of cylinders.
- Find the surface area of cones.
- Determine how changes in dimensions affect area and volume.
- Solve problems involving similar solids.

Instructional Materials/Resources:

- Cylinder
- Cone
- Sphere

Suggested Vocabulary:
Volume, cylinder, composite solids, cone, sphere, hemisphere, lateral area, total surface area, similar solids

Recommended Instructional Activities:
Are you Ready? (pre-requisite skills) Ch 8
Chapter 8: IQL 8-1, Lesson 1, Lesson 2, Lesson 3, Lesson 4, Lesson 5, IQL 8-6, Lesson 6
8 PSI
21st Century Career: Space Architect
Unit Project

Extension Strategies/Activities:

- HOT Problems
- Extended Response Test
- IQL 8-5

Modification Strategies/Activities:

- Differentiated Assignments based on level
- Personal Tutor Video
- IQL 8-4

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Suggested Assessments:
Performance Task:
Pre-Test (made by teacher)
Quiz on 8-1 & 8-2
Quiz on 8-3 & 8-4
Quiz on 8-5 & 8-6
Post-Test (made by teacher)
Other Assessment Evidence:
Student Journal
Portfolio (student work and career projects)

Theme/Unit: **Geometry**	**Suggested Sequence:** **After Unit 2**

NJSLS:

8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations:
a. Lines are transformed to lines and line segments to line segments of the same length
b. Angles are transformed to angles of the same length
c. Parallel lines are transformed to parallel lines

8.G.A.1a Lines are taken to lines, and line segments to line segments of the same length.

8.G.A.1b Angles are taken to angles of the same measure.

8.G.A.1c Parallel lines are taken to parallel lines.

8.G.A.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

.8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

8.G.A.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

8.G.A.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For. example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so

8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Big Ideas:

- Understand congruence and similarity using physical models, transparencies, or geometry software.

Essential Questions:

- How can algebraic concepts be applied to geometry?
- How can we best show or describe the change in position of a figure?
- How can you determine congruence and similarity?

Knowledge, Skills, and Instructional Objectives:

- Examine angle relationships formed by parallel lines and a transversal.
- Identify relationships of angles formed by two parallel lines cut by a transversal.
- Write geometric proofs.
- Find missing angle measures in triangles.
- Find the sum of the angle measures of a polygon and the measure of one interior angle of a regular polygon.
- Find the distance between two points on the coordinate plane.
- Identify and apply flips, slides, and turns.
- Graph translations on the coordinate plane.
- Graph reflections on the coordinate plane.
- Identify rotational symmetry.
- Graph rotations on the coordinate plane.
- Identify dilations.
- Use scale factor to graph dilations.
- Use a series of transformations to create congruent figures.
- Write congruence statements for congruent figures.
- Use transformations to create similar figures.
- Identify similar polygons and find missing measures of similar polygons.
- Solve problems involving similar triangles.
- Find the relationship between perimeters and areas of similar figures.

Instructional Materials/Resources:

eStudent Edition
eTeacher Edition
Interactive Classroom
Leveled Worksheets
Personal Tutor
Self-Check Quiz

Suggested Vocabulary:

Glencoe (Ch 5) perpendicular lines, parallel lines, transversal, interior angles, exterior angles, alternate interior angles, alternate exterior angles, corresponding angles, inductive reasoning, deductive reasoning, proof, paragraph proof, informal proof, two-column proof, formal proof, theorem, triangle, interior angle, exterior angle, remote interior angles, polygons, equiangular, regular polygon, distance formula
Glencoe (Ch 6) Transformation, pre-image, image, translation, congruent, reflection, line of reflection, rotation, center of rotation, dilation, composition of transformations
Glencoe (Ch 7) corresponding parts, similar, fractal, similar polygons, scale factor, indirect measurement

Recommended Instructional Activities: Glencoe Course 3 (8th math)

Getting Ready for the Chapter (Ch 5)
Lesson 5-1, 5-2, 5-3, 5-4, 5-7
Getting Ready for the Chapter (Ch 6)
Lesson 6-1, 6-2, 6-3, 6-4
Getting Ready for the Chapter (Ch 7)
Lesson 7-1, 7-2, 7-3, 7-4, 7-5, 7-7

Extension Strategies/Activities:

- Enrichment Worksheets
- HOT problems

Modification Strategies/Activities:

- Study Guide & Intervention Worksheets
- Pair with student mentor
- Skills Review

	• Personal Tutor (Glencoe)

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Career Ready Practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments:
Performance Task:
Pre-Test (Ch 5)
Quiz 5.1 & 5.2
Quiz 5.3 & 5.4
Quiz 5.6 & 5.7
Post-Test (Ch 5)
Pre-Test (Ch 6)
Quiz 6.1 & 6.2
Quiz 6.3 & 6.4
Post-Test (Ch 6)
Pre-Test (Ch 7)
Quiz 7.1 & 7.2
Quiz 7.3-7.5
Quiz 7.7
Post-Test (Ch 7)
Other Assessment Evidence:
Student Journal & Portfolio

Theme/Unit:	**Suggested Sequence:**
Statistics & Probability	

NJSLS:

8.SP.A.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?

Big Ideas:

- Investigate patterns of association in bivariate data.

Essential Questions:

- How are patterns used when comparing two quantities?

Knowledge, Skills, and Instructional Objectives:

- Construct and interpret two-way tables.

Instructional Materials/Resources:

eStudent Edition
eTeacher Edition
Interactive Classroom
Leveled Worksheets
Personal Tutor
Self-Check Quiz

Suggested Vocabulary:

Glencoe (Ch 9) relative frequency, two-way table, Venn diagram

Recommended Instructional Activities: Glencoe Course 3 (8th math)

Lesson 9.3

Extension Strategies/Activities:

- Enrichment Worksheets
- HOT problems

Modification Strategies/Activities:

- Study Guide & Intervention Worksheets
- Pair with student mentor
- Skills Review
- Personal Tutor (Glencoe)

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CRP11. Use technology to enhance productivity.

Suggested Assessments:
Performance Task:
Quiz 9.3
Other Assessment Evidence:
Student Journal & Portfolio

Honors Algebra

Theme/Unit: **Geometry**	**Suggested Sequence:**

NJSLS:
8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Big Ideas:
- Solve Real-World and Mathematical Problems Involving Volume of Cylinders, Cones, and Spheres.

Essential Questions:
- Why are formulas important in math and science?

Knowledge, Skills, and Instructional Objectives:
- Determine how some three-dimensional figures are related to circles.
- Find the volume of cylinders.
- Find the volume of cones.
- Find the volume of spheres.
- Find the surface area of cylinders.
- Find the surface area of cones.
- Determine how changes in dimensions affect area and volume.
- Solve problems involving similar solids.

Instructional Materials/Resources:	**Suggested Vocabulary:**
• Cylinder • Cone • Sphere	Volume, cylinder, composite solids, cone, sphere, hemisphere, lateral area, total surface area, similar solids

Recommended Instructional Activities:
Are you Ready? (pre-requisite skills) Ch 8
Chapter 8: IQL 8-1, Lesson 1, Lesson 2, Lesson 3, Lesson 4, Lesson 5, IQL 8-6, Lesson 6
8 PSI
21st Century Career: Space Architect
Unit Project

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• HOT Problems • Extended Response Test • IQL 8-5	• Differentiated Assignments based on level • Personal Tutor Video • IQL 8-4

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Career Ready Practices:
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CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP11. Use technology to enhance productivity.

Suggested Assessments:

Performance Task:

Pre-Test (made by teacher)
Quiz on 8-1 & 8-2
Quiz on 8-3 & 8-4
Quiz on 8-5 & 8-6
Post-Test (made by teacher

Other Assessment Evidence:

Student Journal
Portfolio (student work and career project

Theme/Unit: **Geometry**	**Suggested Sequence:**

NJSLS:

8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations
a. Lines are transformed to lines and lines segments to line segments of the same length
b. Angles are transformed to angles of the same measure
c. Parallel lines are transformed to parallel lines

8.G.A.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

8.G.A.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them

8.G.A.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For. example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so

8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems

Big Ideas:

- Understand congruence and similarity using physical models, transparencies, or geometry software.

Essential Questions:

- How can algebraic concepts be applied to geometry?
- How can we best show or describe the change in position of a figure?

- How can you determine congruence and similarity?

Knowledge, Skills, and Instructional Objectives:

- Examine angle relationships formed by parallel lines and a transversal.
- Identify relationships of angles formed by two parallel lines cut by a transversal.
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- Find missing angle measures in triangles.
- Find the sum of the angle measures of a polygon and the measure of one interior angle of a regular polygon.
- Find the distance between two points on the coordinate plane.
- Identify and apply flips, slides, and turns.
- Graph translations on the coordinate plane.
- Graph reflections on the coordinate plane.
- Identify rotational symmetry.
- Graph rotations on the coordinate plane.
- Identify dilations.
- Use scale factor to graph dilations.
- Use a series of transformations to create congruent figures.
- Write congruence statements for congruent figures.
- Use transformations to create similar figures.
- Identify similar polygons and find missing measures of similar polygons.
- Solve problems involving similar triangles.
- Find the relationship between perimeters and areas of similar figures.

Instructional Materials/Resources:

eStudent Edition
eTeacher Edition
Interactive Classroom
Leveled Worksheets
Personal Tutor
Self-Check Quiz

Suggested Vocabulary:

Glencoe (Ch 5) perpendicular lines, parallel lines, transversal, interior angles, exterior angles, alternate interior angles, alternate exterior angles, corresponding angles, inductive reasoning, deductive reasoning, proof, paragraph proof, informal proof, two-column proof, formal proof, theorem, triangle, interior angle, exterior angle, remote interior angles, polygons, equiangular, regular polygon, distance formula
Glencoe (Ch 6) Transformation, pre-image, image, translation, congruent, reflection, line of reflection, rotation, center of rotation, dilation, composition of transformations
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Recommended Instructional Activities: Glencoe Course 3 (8th math)
Getting Ready for the Chapter (Ch 5)
Lesson 5-1, 5-2, 5-3, 5-4, 5-7
Getting Ready for the Chapter (Ch 6)
Lesson 6-1, 6-2, 6-3, 6-4
Getting Ready for the Chapter (Ch 7)
Lesson 7-1, 7-2, 7-3, 7-4, 7-5, 7-7

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Enrichment Worksheets • HOT problems	• Study Guide & Intervention Worksheets • Pair with student mentor • Skills Review • Personal Tutor (Glencoe)

Suggested Assessments:
Performance Task:
Pre-Test (Ch 5)
Quiz 5.1 & 5.2
Quiz 5.3 & 5.4
Quiz 5.6 & 5.7
Post-Test (Ch 5)
Pre-Test (Ch 6)
Quiz 6.1 & 6.2
Quiz 6.3 & 6.4
Post-Test (Ch 6)
Pre-Test (Ch 7)
Quiz 7.1 & 7.2
Quiz 7.3-7.5
Quiz 7.7
Post-Test (Ch 7)
Other Assessment Evidence:
Student Journal & Portfolio

Theme/Unit: **Relationships between Quantities**	**Suggested Sequence:**

NJSLS:

SSE.A.1a Interpret parts of an expression, such as terms, factors, and coefficients.

SSE.A.1b Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)n as the product of P and a factor not depending on P.

SSE.A.2 Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).

CED.A.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

REI.D.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

IF.A.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).

IF.A.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

Q.A.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

Big Ideas:

- Why is learning mathematics important?

Essential Questions:

- How can mathematical ideas be represented?
- Why is it helpful to represent the same mathematical idea in different ways?

Knowledge, Skills, and Instructional Objectives:

- Write verbal expressions for algebraic expressions.
- Write algebraic expressions for verbal expressions.
- Evaluate numerical expressions by using the order of operations.
- Evaluate algebraic expressions by using the order of operations.
- Recognize the properties of equality and identity.
- Recognize the Commutative and Associative Properties.
- Use the distributive property to evaluate expressions.
- Use the distributive property to simplify expressions.
- Solve equations with one variable.
- Solve equations with two variables.

- Represent relations,
- Interpret graphs of relations.
- Use technology to represent a function as a table and a graph.
- Translate sentences into equations.
- Translate equations into sentences.
- Solve equations by using addition or subtraction.
- Solve equations by using multiplication and division.
- Solve equations involving more than one operation.
- Solve equations involving consecutive integers.
- Solve equations with the variable on one side.
- Solve equations involving grouping symbols.
- Evaluate absolute value expressions.
- Solve absolute value equations.
- Compare ratios.
- Solve proportions.
- Find the percent of change.
- Solve problems involving percent of change.
- Solve equations for given variables.
- Use formulas to solve real-world problems.
- Solve mixture problems.
- Solve uniform motion problems.

Instructional Materials/Resources:
eStudent Edition
eTeacher Edition
Interactive Classroom
Leveled Worksheets
Personal Tutor
Self-Check Quiz

Suggested Vocabulary:
Ch 1: Algebraic expressions, variable, term, factor, product, power, exponent, base, evaluate, order of operations, equivalent expressions, additive identity, multiplicative identity, multiplicative inverse, reciprocal, like terms, simplest form, coefficient, open sentence, equation, solving, solution, replacement set, set, element, solution set, identity, coordinate system, coordinate plane, x-and y-axes, origin, ordered pair, x- and y-coordinates, relation, mapping, domain, range, independent variable, dependent variable, function, discrete function, continuous function, vertical line test, function notation, nonlinear function, intercepts, x- and y-intercept, line symmetry, positive, negative, increasing, decreasing, extrema, relative maximum, relative minimum, end behavior
Ch 2: formula, solve an equation, equivalent equations, multi-step equation, consecutive integers, number theory, identity, ratio, proportion, means, extremes, rate, unit rate, scale, scale model, percent of change, percent of increase, percent of decrease, literal equation, dimensional analysis, unit analysis, weighted average, mixture problem, uniform motion problem, rate problem

Technology/21st Century/Cross-curricular Connections:
Technology:
8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge.
8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will

	develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
Getting Ready for the Chapter
Lesson 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8
Mid-Chapter Quiz
Study Guide & Review
Practice Test
Getting Ready for the Chapter (Ch 2)
Lesson 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, 2-9
Mid-Chapter Quiz
Study Guide & Review
Practice Test

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Enrichment Worksheets • HOT problems	• Study Guide & Intervention Worksheets • Pair with student mentor • Skills Review • Personal Tutor (Glencoe)

Suggested Assessments:
Performance Task:
Pre-Test (Ch 1)
Quiz 1.1 – 1.2
Quiz 1.3 - 1.4
Quiz 1.5 - 1.6
Quiz 1.7 - 1.8
Mid-Chapter Quiz (Formative Assessment)
Post-Test (Ch 1)
Pre-Test (Ch 2)
Quiz 2.1 – 2.3

Quiz 2.4 – 2.5
Quiz 2.6 - 2.7
Quiz 2.8 – 2.9
Mid-Chapter Quiz (Formative Assessment)
Post-Test (Ch 2)
Other Assessment Evidence:
Student Journal & Portfolio

Theme/Unit: **Linear Relationships**	**Suggested Sequence:**

NJSLS:

REI.D.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

CED.A.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

CED.A.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.

REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

REI.C.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation. and a multiple of the other produces a system with the same solutions

REI.C.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

REI.D.12 Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

IF.A.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then). f(x) denotes the output of f corresponding to the input x. The graph off is the graph of the equation y = f(x)

IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key. features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity

IF.B.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

IF.C.7a Graph linear and quadratic functions and show intercepts, maxima, and minima.

Q.A.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

BF.A.2 Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model

	situations, and translate between the two forms.
LE.A.1b	Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
LE.A.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

Big Ideas:

- Why is learning mathematics important?

Essential Questions:

- Why are graphs useful?
- Why is math useful to model real-world situations?
- How are symbols useful in mathematics?
- What mathematical symbols do you know?
- How can you find the solution to a math problem?

Knowledge, Skills, and Instructional Objectives:

- Analyze the key features of linear graphs.
- Identify linear equations, intercepts, andn zeros.
- Graph linear equations.
- Solve linear equations by graphing.
- Estimate solutions to an equation by graphing.
- Change the viewing window so that a complete graph of a linear function can be displayed.
- Use rate of change to solve problems.
- Find the slope of a line.
- Write and graph direct variation equations.
- Solve problems involving direct variation.
- Recognize arithmetic sequences.
- Relate arithmetic sequences to linear functions.
- Investigate inductive and deductive reasoning.
- Write an equation for a proportional relationship.
- Write an equation for a non-proportional relationship.
- Write and graph linear equations in slope-intercept form.
- Model real-world data with equations in slope-intercept form.
- Use a graphing calculator to investigate families of linear functions.
- Write an equation of a line in slope-intercept for given the slope and one point.
- Write an equation of a line in slope-intercept form given two points.
- Write equations of lines in point-slope form.
- Write linear equations in different forms.
- Write an equation of the line that passes through a given point, parallel to a given line.
- Write an equation of the line that passes through a given point, perpendicular to a given line.
- Investigate relationships between quantities by using points on scatter plots.
- Use lines of fit to make and evaluate predictions.
- Explore the difference between correlation and causation.
- Write equations of best-fit lines using linear regression.
- Write equations of median-fit lines.
- Find the inverse of a relation.
- Find the inverse of a linear function.
- Draw the inverse of a relation and determine whether the inverse is a function.
- Solve linear inequalities by using addition and subtraction.

- Solve linear inequalities by using multiplication and division.
- Solve linear inequalities involving more than one operation.
- Solve linear inequalities involving the distributive property.
- Identify compound statements connected by the word *and* or *or* as true or false.
- Solve compound inequalities containing the word *and* and graph their solution set.
- Solve compound inequalities containing the word *or* and graph their solution set.
- Solve and graph absolute value inequalities (<) and (>).
- Graph linear inequalities on the coordinate plane.
- Solve inequalities by graphing.
- Use a graphing calculator to investigate the graphs of inequalities.
- Determine the number of solutions a system of linear equations has, if any.
- Solve systems of linear equations by graphing.
- Use a graphing calculator to solve a system of equations.
- Solve systems of equation by using substitution.
- Solve real-world problems involving systems of equation sby using substitution.
- Solve systems of equations by using elimination with addition.
- Solve systems of equations by using elimination with subtraction.
- Solve systems of equations by using elimination with multiplication.
- Solve real-world problems involving systems of equations.
- Determine the best method for solving systems of equations.
- Apply systems of equations.
- Use matrices to solve systems of equations.
- Solve systems of linear inequalities by graphing.
- Apply systems of linear inequalities.
- Use a graphing calculator to explore systems of inequalities.

Instructional Materials/Resources:	**Suggested Vocabulary:**
eStudent Edition eTeacher Edition Interactive Classroom Leveled Worksheets Personal Tutor Self-Check Quiz Grid Paper (Extend 4-5) Patty-Paper & Colored Pencils(Extend 4-7) Algebra Tiles (Explore 5-2) Graphing Calculators (Extend 3-2,Extend 5-6, Extend 6-1, Extend 6-5)	Ch 3: linear function, constant function, standard form, constant, x-intercept, y-intercept, parent function, family of graphs, root, zeros, standard viewing window, complete graph, rate of change, slope, direct variation, constant of variation, constant of proportionality, sequence, terms, arithmetic sequence, common difference, inductive reasoning, deductive reasoning Ch 4: slope-intercept form, constant function, identity function, constraint, linear extrapolation, point-slope form, parallel lines, perpendicular lines, bivariate data, scatter plot, line of fit, linear interpolation, causation, best-fit line, linear regression, correlation coefficient, residual, median-fit line, inverse relation, inverse function Ch 5: set-builder notation, compound inequality, intersection, union, boundary, half-plane, closed(open) half-plane Ch 6: system of equations, consistent, independent, dependent, inconsistent, substitution, elimination, matrix, elements, dimensions, augmented matrix, row

	reduction, identity matrix, system of inequalities
	Technology/21st Century/Cross-curricular Connections: **Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
Getting Ready for the Chapter (Ch 3)
Lesson 3-1, 3-2, 3-3, 3-4, 3-5, 3-6
Getting Ready for the Chapter (Ch 4)
Explore 4-1, Lesson 4-1, Extend 4-1, 4-2, 4-3, 4-4, 4-5, Extend 4-5, 4-6, 4-7, Extend 4-7
Getting Ready for the Chapter (Ch 5)
Lesson 5-1, Explore 5-2, 5-2, 5-3, Explore 5-4, 5-4, 5-5, 5-6, Extend 5-6
Getting Ready for the Chapter (Ch 6)
Lesson 6-1, Extend 6-1, 6-2, 6-3, 6-4, 6-5, Extend 6-5, 6-6, Extend 6-6

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Enrichment Worksheets • HOT problems	• Study Guide & Intervention Worksheets • Pair with student mentor • Skills Review • Personal Tutor (Glencoe)

Suggested Assessments:
Performance Task:
Pre-Test (Ch 3)
Quiz 3.1 & 3.2
Quiz 3.3 & 3.4
Mid-Chapter Quiz (3.1-3.3)
Quiz 3.5 & 3.6
Post-Test (Ch 3)
Pre-Test (Ch 4)
Quiz 4.1 – 4.3
Mid-Chapter Quiz (4.1 - 4.3)
Quiz 4.4 - 4.5
Quiz 4.6 - 4.7
Post-Test (Ch 4)
Pre-Test (Ch 5)
Quiz 5.1-5.3
Mid-Chapter Quiz (5.1-5.3)
Quiz 5.4-5.5
Quiz 5.6
Post-Test (Ch 5)
Pre-Test (Ch 6)
Quiz 6.1
Quiz 6.2 -6.4
Mid-Chapter Quiz (6.1-6.4)
Quiz 6.5 & 6.6
Post-Test (Ch 6)
Other Assessment Evidence:
Student Journal & Portfolio

Theme/Unit: **Exponential & Quadratic Relationships**	**Suggested Sequence:**

NJSLS:
SSE.A.2 Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus

	recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).
SSE.A.1a	Interpret parts of an expression, such as terms, factors, and coefficients.
SSE.B.3a	Factor a quadratic expression to reveal the zeros of the function it defines.
SSE.B.3b	Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines
SSE.B.3c	Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be rewritten as (1.151/12)12t ≈ 1.01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.
REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
REI.B.4	Solve quadratic equations in one variable
REI.B.4b	Solve quadratic equations by inspection (e.g., for x2 = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b
REI.D.11	Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.
APR.A.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
IF.A.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1
IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity
IF.B.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
IF.C.7a	Graph linear and quadratic functions and show intercepts, maxima, and minima.
IF.C.7b	Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
IF.C.7e	Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
IF.C.8a	Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context
IF.C.8b	Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y = (1.02)t, y = (0.97)t, y = (1.01)12t, y = (1.2)t/10, and classify them as representing exponential growth or decay.
RN.A.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer. exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define 51/3 to be the cube root of 5 because we want (51/3)3 = 5(1/3)3 to hold, so (51/3)3 must equal 5
RN.A.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.
LE.A.1	Distinguish between situations that can be modeled with linear functions and with exponential functions.
LE.A.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms

BF.B.3	Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
ID.B.6a	Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given unctions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.

Big Ideas:

- Why is learning mathematics important?

Essential Questions:

- How can you make good decisions?
- What factors can affect good decision making?
- When could a nonlinear function be used to model a real-world situation?

Knowledge, Skills, and Instructional Objectives:

- Multiply monomials using the properties of exponents.
- Simplify expressions using the multiplication properties of exponents.
- Divide monomials using properties of exponents.
- Simplify expressions containing negative and zero exponents.
- Evaluate and rewrite expressions involving rational exponents.
- Solve equations involving expressions with rational exponents.
- Express numbers in scientific notation.
- Find products and quotients of numbers expressed in scientific notation.
- Use a graphing calculator to investigate families of exponential functions.
- Graph exponential functions.
- Identify data that display exponential behavior.
- Use a graphing calculator to solve exponential equations and inequalities.
- Solve problems involving exponential growth.
- Solve problems involving exponential decay.
- Use properties of rational exponents to transform expressions for exponential functions into equivalent forms to solve problems.
- Identify and generate geometric sequences.
- Relate geometric sequences to exponential functions.
- Calculate and interpret the average rate of change of an exponential function.
- Use a recursive formula to list the terms in a sequence.
- Write recursive formulas for arithmetic and geometric sequences.
- Write polynomials in standard form.
- Add and subtract polynomials.
- Multiply a polynomial by a monomial.
- Solve equations involving the products of monomials and polynomials.
- Multiply binomials using the FOIL method.
- Multiply polynomials by using the distributive property.
- Find squares of sums and differences.
- Find the product of a sum and a difference.
- Use the distributive property to factor polynomials.
- Solve quadratic equations of the form $ax^2 + bx = 0$.
- Factor trinomials of the form $x^2 + bx + c$.
- Solve equations of the form $x^2 + bx + c = 0$.

- Factor trinomials of the form $ax^2 + bx + c$.
- Solve equations of the form $ax^2 + bx + c = 0$.
- Factor binomials that are the difference of squares.
- Use the difference of squares to solve equations.
- Factor perfect square trinomials.
- Solve equations involving perfect squares.
- Analyze the characteristics of the graphs of quadratic functions.
- Graph quadratic functions.
- Use a given quadratic function to investigate the rate of change of a quadratic function.
- Use a graphing calculator to investigate quadratic inequalities.
- Solve quadratic equations by graphing.
- Estimate solutions of quadratic equations by graphing.
- Use a graphing calculator to investigate quadratic inequalities.
- Use a graphing calculator to investigate families of quadratic functions.
- Apply translations of quadratic functions.
- Use a graphing calculator to solve a system of one linear and one quadratic equation.
- Complete the square to write perfect square trinomials.
- Solve quadratic equations by completing the square.
- Complete the square in a quadratic expression to find the maximum or minimum value of the related function.
- Solve quadratic equations by using the quadratic formula.
- Use the discriminant to determine the number of solutions to a quadratic equation.
- Identify linear, quadratic, and exponential functions from given data.
- Write equations that model data.
- Use a graphing calculator to find an appropriate regression equation for a set of data.
- Identify and graph step functions.
- Identify and graph absolute value and piecewise-defined functions.
- Use a graphing calculator to investigate piecewise-linear functions.

Instructional Materials/Resources:	**Suggested Vocabulary:**
eStudent Edition eTeacher Edition Interactive Classroom Leveled Worksheets Personal Tutor Self-Check Quiz Graphing Calculator (Explore 7-5, Extend 7-5, Extend 7-6, Extend 7-7) Algebra Tiles (Explore 8-1, 8-3, 8-5, 8-6) Graphing Calculator (Extend 9-2, Explore 9-3, Extend 9-3)	Ch 7: monomial, constant, zero exponent, negative exponent, order of magnitude, rational exponent, cube root, nth root, exponential equation, scientific notation, exponential function, exponential growth function, exponential decay function, compound interest, geometric sequence, common ratio, recursive formula Ch 8: polynomial, binomial, trinomial, degree of a monomial, degree of a polynomial, leading coefficient, FOIL method, quadratic expression, factoring, factoring by grouping, zero product property, quadratic equation, prime polynomial, difference of two squares, perfect square trinomial Ch 9: quadratic function, standard form, parabola, axis of symmetry, vertex, minimum, maximum, double root, transformation, translation, dilation, reflection, vertex form, completing the square, quadratic formula, discriminant, coefficient of determination, step function, piecewise-linear

	function, greatest integer function, absolute value function, piecewise-defined function
	Technology/21st Century/Cross-curricular Connections: **Technology:** 8.1- Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate to create and communicate knowledge. 8.2- Technology, Education, Engineering, Design, and Computational Thinking – Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. **Career Ready Practices:** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
Getting Ready for the Chapter (Ch 7)
Lesson 7-1, 7-2, 7-3, 7-4, Explore 7-5, 7-5, Extend 7-5, 7-6, Extend 7-6, 7-7, Extend 7-7, 7-8
Getting Ready for the Chapter (Ch 8)
Explore 8-1,Lesson 8-1, 8-2, Explore 8-3, 8-3, 8-4, Explore 8-5, 8-5, Explore 8-6, 8-6, 8-7, 8-8, 8-9
Getting Ready for the Chapter (Ch 9)
Lesson 9-1, Extend 9-1, 9-2, Extend 9-2, Explore 9-3, 9-3, Extend 9-3, 9-4, Extend 9-4, 9-5, 9-6, Extend 9-6, 9-7, Extend 9-7

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Enrichment Worksheets	• Study Guide & Intervention Worksheets

• HOT problems	• Pair with student mentor • Skills Review • Personal Tutor (Glencoe)

Suggested Assessments:
Performance Task:
Pre-Test (Ch 7)
Quiz 7.1 & 7.2
Quiz 7.3 & 7.4
Mid-Chapter Quiz (7.1-7.4)
Quiz 7-5 & 7-6
Quiz 7-7 & 7-8
Post-Test (Ch 7)
Pre-Test (Ch 8)
Quiz 8.1 & 8.2
Quiz 8.3 & 8.4
Mid-Chapter Quiz (8.1-8.4)
Quiz 8.5
Quiz 8.6 & 8.7
Quiz 8.8 & 8.9
Post-Test (Ch 8)
Pre-Test (Ch 9)
Quiz 9.1 & 9.2
Quiz 9.3
Quiz 9.4
Mid-Chapter Quiz (9.2-9.4)
Quiz 9.5
Quiz 9.6 & 9.7
Post-Test (Ch 9)
Other Assessment Evidence:
Student Journal & Portfolio

Theme/Unit: **Advanced Functions and Equations**	**Suggested Sequence:**

NJSLS:

REI.B.4a Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p)2 = q that has the same solutions. Derive the quadratic formula from this form

REI.D.11 Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions

CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

BF.B.4a Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the

	inverse. For example, f(x) =2 x3 or f(x) = (x+1)/(x–1) for x ≠ 1.
IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity
IF.C.7a	Graph linear and quadratic functions and show intercepts, maxima, and minima.
IF.C.7b	Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
RN.A.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents
8.G.B.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
8.EE.A.2	Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational

Big Ideas:

- Why is learning mathematics important?

Essential Questions:

- How can you choose a model to represent a real-world situation?
- How can simplifying mathematical expressions be useful?

Knowledge, Skills, and Instructional Objectives:

- Find the inverse of a quadratic function.
- Graph and analyze dilations of radical functions.
- Graph and analyze reflections and translations of radical functions.
- Use a graphing calculator to investigate the graphs of square root functions.
- Simplify radical expressions by using the Product Property of Square Roots.
- Simplify radical expressions by using the Quotient Property of Square Roots.
- Add and subtract radical expressions.
- Multiply radical expressions.
- Simplify radical expressions with indices greater than 2 and with variables and/or rational numbers in the radicand.
- Solve radical equations.
- Solve radical equations with extraneous solutions.
- Solve problems by using the Pythagorean Theorem.
- Determine whether a triangle is a right triangle.
- Investigate distances on the coordinate plane.
- Identify and use inverse variations.
- Graph inverse variations.
- Use graphing technology to investigate families of rational functions.
- Identify excluded values.
- Identify and use asymptotes to graph rational functions.
- Identify values excluded from the domain of a rational expression.
- Simplify rational expressions.
- Use a graphing calculator to simplify rational expressions, and verify solutions and excluded values.
- Multiply rational expressions.
- Divide rational expressions.
- Divide a polynomial by a monomial.
- Divide a polynomial by a binomial.

- Add and subtract rational expressions with like denominators.
- Add and subtract rational expressions with unlike denominators.
- Simplify mixed expressions.
- Simplify complex fractions.
- Solve rational equations.
- Use rational equations to solve problems.

Instructional Materials/Resources:
eStudent Edition
eTeacher Edition
Interactive Classroom
Leveled Worksheets
Personal Tutor
Self-Check Quiz

Suggested Vocabulary:
Ch 10: radical expression, rationalizing the denominator, conjugate, radical equations, extraneous solutions, hypotenuse, legs, converse, Pythagorean Triple, distance formula, midpoint
Ch 11: inverse variation, product rule, rational function, excluded value, asymptote, rational expression, least common multiple, lease common denominator, mixed expression, complex fraction, rational equation, extraneous solution, work and rate problems

Technology/21st Century/Cross-curricular Connections:
Technology:
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CRP11. Use technology to enhance productivity.

Recommended Instructional Activities:
Getting Ready for the Chapter (Ch 10)
Lesson Explore 10-1, 10-1, Extend 10-1, 10-2, Explore 10-2, 10-3, Extend 10-3, 10-4, 10-5
Getting Ready for the Chapter (Ch 11)
Lesson 11-1, Explore 11-2, 11-2, 11-3, Extend 11-3, 11-4, 11-5, 11-6, 11-7, 11-8

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Enrichment Worksheets • HOT problems	• Study Guide & Intervention Worksheets • Pair with student mentor • Skills Review • Personal Tutor (Glencoe)

Suggested Assessments:

Performance Task:

Pre-Test (Ch 10)
Quiz 10.1
Quiz 10.2
Quiz 10.3 & 10.4
Quiz 10.5
Post-Test (Ch 10)
Pre-Test (Ch 11)
Quiz 11.1
Quiz 11.2
Quiz 11.3 & 11.4
Mid-Chapter Quiz (11.1-11.4)
Quiz 11.5 & 11.6
Quiz 11.7 & 11.8
Post-Test (Ch 11)

Other Assessment Evidence:

Student Journal & Portfolio

Theme/Unit: **Statistics & Probability**	**Suggested Sequence:**

NJSLS:

8.SP.A.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?

Big Ideas:

- Investigate patterns of association in bivariate data.

Essential Questions:

- How are patterns used when comparing two quantities?

Knowledge, Skills, and Instructional Objectives:

- Construct and interpret two-way tables.

Instructional Materials/Resources:

eStudent Edition
eTeacher Edition
Interactive Classroom
Leveled Worksheets
Personal Tutor
Self-Check Quiz

Suggested Vocabulary:

Glencoe (Ch 9) relative frequency, two-way table, Venn diagram

Technology/21st Century/Cross-curricular Connections:

Technology:

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CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of

	problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP11. Use technology to enhance productivity.

Recommended Instructional Activities: Glencoe Course 3 (8th math)

- Lesson 9.3

Extension Strategies/Activities:	**Modification Strategies/Activities:**
• Enrichment Worksheets • HOT problems	• Study Guide & Intervention Worksheets • Pair with student mentor • Skills Review • Personal Tutor (Glencoe)

Suggested Assessments:
Performance Task:
Quiz 9.3
Other Assessment Evidence:
Student Journal & Portfolio

Board Policies Applicable to Curriculum

2110 PHILOSOPHY OF EDUCATION

The Westampton Township Public Schools will provide a high quality, age appropriate educational experience that empowers children to reach their academic potentials, become well-rounded individuals and develop a love for learning within a safe, secure, nurturing social and academic environment.

The social environment is one which fosters: risk taking; development of positive self-concept; individuality; respect for diversity; social consciousness; positive social interaction, and encourages students to expand their roles as active participants in their community and world.

The academic environment will provide increased opportunities for students to: value learning; develop as creative and critical thinkers and problem solvers in both academic and social situations; and make critical connections between present learning and the world around them.

Adopted: 8 November 2008

2132 SCHOOL DISTRICT GOALS AND OBJECTIVES

The Board adopts the following goals and objectives for the operation of the educational program of the school district.

- Develop skills in reading, writing, speaking and listening.
- Develop skills in mathematics, science and computer science.
- Develop pride in work and a feeling of self-worth.
- Develop good character and self-respect.
- Gain a general education.
- Learn how to examine and use information.
- Learn to respect and get along with people with whom we work and live.
- Develop a desire for learning now and in the future.
- Learn about and try to understand the changes that take place in the world.
- Learn how to respect and get along with people who think, dress, and act differently.
- Learn how to be a good citizen.
- Understand and practice democratic ideas and ideals.
- Understand and practice the skills of family living.
- Learn how to be a good manager of money, property and resources.
- Learn how to use leisure time.
- Practice and understand the ideas of health and safety.
- Appreciate culture and beauty in the world.
- Develop skills to enter a specific field of work.
- Gain information needed to make job selections.

N.J.A.C. 6:8-2.1
N.J.S.A. 18A:7A-7

Adopted: 8 September 2014

2200 CURRICULUM CONTENT
M

The Board of Education will provide the instruction and services mandated by law and rules as necessary for the implementation of a thorough and efficient system of free public education and such other instruction and services as the Board deems appropriate for the thorough and efficient education of the pupils of this district. The Board shall annually approve a list of all programs and courses that comprise the district's curriculum and shall approve any subsequent changes in the curriculum in accordance with Policy No. 2220.

For purposes of this policy "curriculum" means planned learning opportunities designed to assist pupils toward the achievement of the intended outcomes of instruction.

The curriculum will be reviewed by the Superintendent and approved annually by the Board. In accordance with law, the curriculum shall, as a minimum, include the curricular mandates of N.J.S.A. 18A - Education and N.J.A.C. 6 and 6A - Education and all of the New Jersey Core Curriculum Standards, Indicators and Frameworks.

The Superintendent is responsible for implementing the curriculum approved by the Board.

The Board directs that the curriculum be consistent with the educational goals and objectives of this district and responsive to identified pupil needs. The Superintendent shall, in consultation with teaching staff members, assure the effective articulation of curriculum across all grade levels and among the schools of this district, and among the constituent districts of the Rancocas Valley Regional School District.

The curriculum shall provide programs in accordance with Board policies and the New Jersey Core Curriculum Content Standards, including but not limited to:

1. Preparation of all pupils for employment or post secondary study upon graduation from high school.

2. Instruction in workplace readiness skills, visual and performing arts, comprehensive health and physical education, language arts literacy, mathematics, science, social studies (including instruction on the Constitution of the United States, United States history, Community Civics, and the geography, history and civics of New Jersey) and World Languages;

3. Continuous access to sufficient programs and services of a library/media facility, classroom collection, or both, to support the educational program of all pupils in accordance with Policy No. 2530;

4. Guidance and counseling to assist in career and academic planning for all pupils, in accordance with Policy No. 2411;

5. A continuum of educational programs and services for all children with disabilities, in accordance with Policy No. 2460 and Regulation Nos. 2460.1 through 2460.14;

6. Bilingual education, English as a Second Language, and English language services for pupils of limited English language proficiency, when the number of such pupils so necessitates, in accordance with Policy No. 2423;

7. Programs and services for pupils at risk who require remedial assistance in accordance with Policy Nos. 2414, 2415, and 5460;

8. Equal educational opportunity for all pupils in accordance with Policy Nos. 2260, 5750 and 5755;

9. Career awareness and exploration as required, and vocational education as appropriate;

10. Educational opportunities for pupils with exceptional abilities, in accordance with Policy No. 2464;

11. Instruction in accident and fire prevention;

12. A substance abuse prevention program;

13. A program for family life education; and

14. Programs that encourage the active involvement of representatives from the community, business, industry, labor and higher education in the development of educational programs aligned with the standards.

N.J.S.A. 18A:6-2; 18A:6-3; 18A:35-1 et seq.
N.J.A.C. 6A:8-1.1 et seq.; 6A:14 et seq.
N.J.A.C. 6:29-4.1; 6:29-6.6
New Jersey Core Curriculum Content Standards

Adopted: 14 November 2016

2210 CURRICULUM DEVELOPMENT
M

The Board of Education is committed to the continuing improvement of the educational program of the district. To this end, the curriculum shall be evaluated and modified in accordance with a plan for curriculum development.

As educational leader of the district, the Superintendent shall be responsible to the Board for the development of curriculum and shall establish procedures for curriculum development that insure the effective participation of teaching staff members, pupils, the community, and members of the Board.

The Superintendent shall report to the Board the objectives, evaluative criteria and costs of each proposed program before seeking Board adoption. New programs and courses of study shall not be acted upon by the Board until the meeting following their presentation, in order for Board members to have an opportunity to review the proposed program.

Criteria by which the Board will judge the acceptability of new course offerings include:

1. Does it address an identified pupil need?

2. Is it relevant to the Board's philosophy and goals and does it offer real possibilities for progress toward these goals?

3. If the proposed course replaces an existing program, what defect in the previous program is it designed to overcome?

4. Does it include the criteria by which progress can be measured?

5. Has it been thoroughly studied and/or tested by district staff or by another district? What were the results?

6. Has a curriculum guide been completed? If not, when can it be expected?

7. Have the associated textbooks been recommended to the Board?

8. Have the costs and time of implementation been reviewed, including inservice training?

A five-year plan for updating curriculum shall be developed and implemented. The Superintendent shall report annually on all progress in curriculum development and the implementation of the five-year curriculum plan at the time of the Board's annual adoption of curriculum.

The Superintendent may conduct experimental programs that are not part of the duly adopted curriculum and are deemed to be necessary to the continuing growth of the instructional program; he or she shall report to the Board any such pilot program conducted, along with its objectives, evaluative criteria, and costs, before each such program is initiated.

The Superintendent shall report to the Board periodically on all progress in curriculum development.

Adopted: 2 May 2000

2220 ADOPTION OF COURSES
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The Board of Education shall provide a comprehensive instructional program to serve the needs of the children of this district. In furtherance of this goal and pursuant to law, the Board shall annually adopt the existing courses of study. Adoption includes both content and credit allocation. The Board's policy in this respect is to:

1. Adopt those core content standards mandated by the state in a form acceptable to the State Department of Education.

2. Adopt additional core content standards to meet the changing needs of pupils and the community.

3. Adapt and revise existing courses of study to meet the changing needs of pupils and the community.

Existing courses shall be reviewed at regular intervals and revised as necessary. No course of study shall be eliminated, revised or implemented without the approval of the Board.

The Board directs that the curriculum of this district:

1. Be consistent with written goals, objectives and identified pupil needs;

2. Develop individual talents and interests and serve diverse learning styles to motivate pupil achievement;

3. Provide for continuous learning through effective articulation;

4. Provide all pupils continuous access to sufficient programs and services of a library/media facility, classroom collection, or both, to support the educational program;

5. Provide all pupils guidance and counseling to assist in career and academic planning;

6. Provide a continuum of educational programs and services for handicapped children, pursuant to law and regulation;

7. Provide bilingual programs for pupils whose dominant language is not English, pursuant to law and regulation;

8. Provide compensatory education programs for pupils, pursuant to law and regulation;

9. Provide all pupils equal educational opportunity, pursuant to law and regulation;

10. Provide career awareness and vocational education, pursuant to law and regulation;

11. Provide educational opportunities for exceptionally gifted and talented pupils.

The Superintendent shall maintain a current list of all courses of study offered by this district; shall furnish each member of the Board of Education with a copy upon request; and shall provide a copy in the district office for public referral.

Adoption of courses shall be by a recorded roll call majority vote of the full membership of the Board. This includes the courses in the special education and ESL/bilingual programs, and those for the adult high school.

N.J.S.A. 18A:4-25; 18A:4-28; 18A:7A-6; 18A:33-1; 18A:35-1 et seq.
N.J.A.C. 6:4-1.1 et seq.; 6:8-4.6; 6:8-7.1; 6:39-1.2

Adopted: 14 November 2016

2230 COURSE GUIDES

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The Superintendent shall oversee development of curriculum guides for every course and area of study for every grade level. Each guide shall contain objectives for concepts and skills to be taught and attitudes to be developed; necessary study skills; suggested materials and activities designed to achieve all of these; and evaluation criteria intended to test the extent to which learning objectives have been met.

Teachers shall use the guides as the core of their instructional planning. It shall be the responsibility of the building principal to ensure that curriculum guides are being followed.

A copy of each guide in use shall be kept on file in each school office. Such guides shall be available for inspection. Because curriculum guides are the means of implementing instruction in courses adopted by the Board as the curriculum of the district, the Board shall approve any new curriculum guides or any revision to an existing guide before they are put into effect.

N.J.S.A. 18A:33-1

Adopted: 2 May 2000

Curriculum Revision Commentary

In order to achieve the district's philosophy of high quality educational experiences for all students, curriculum review and revision must become an ongoing process in Westampton Township Public Schools.

Further examination of the curriculum documents revealed three key findings:

- New Jersey Core Curriculum Content Standards were not present in all content areas.
- There were instructional gaps in some content areas.
- New materials and resources, recently approved by the Board of Education, for use in the classroom, were not represented in the curriculum documents.

This resulted in curriculum mapping throughout all content areas, with the goal of rewriting curriculum in all areas to reflect the current best practices and programs implemented in the school district as well as align the curriculum with the New Jersey Core Curriculum Content Standards and the information provided in the New Jersey Standards Clarification Project Phase I.

Phase I Curriculum Mapping

Phase II Curriculum Writing

Phase III – Curriculum Initial Implementation

Recommended 5 Year Cycle - In an effort to streamline the process for future curriculum review and revision, the following five-year curriculum revision cycle will be implemented:

Year 1: Curriculum Evaluation and Development

- Examine the state statues, state administrative code, and board policy to ensure compliance and develop direction for curriculum revision.
- Research current data, trends, and best practices in the content area.
- Complete curriculum audit, including teacher surveys and discussions, to determine curriculum strengths and areas of concern
- Develop K-8 curriculum maps in the respective content area
- Determine learning outcomes, and assessments based on state standards
- Select and purchase new programs and materials, if necessary
- Plan district wide articulation sessions focusing on new initiatives

Year 2: Initial Implementation and Revision

- Create a new curriculum draft
- Plan professional development to facilitate the implementation of new instructional practices and programs relative to the new curriculum.
- Provide professional development for administrators to support the implementation and supervision of new curriculum.
- Use teacher feedback and recommendation to support revisions of the curriculum draft.
- Include additional instructional activities, cross-curricular connections and technology to move the document from being a work in progress to a finished product.
- Begin collecting and analyzing data to determine impact of new curriculum on student learning.

Years 3 and 4: Full Implementation

- Implement revisions to the curriculum
- Monitor the implementation of curriculum with the new revisions.
- Continue to provide support and staff development
- Identify further areas of revision and amend the curriculum, if necessary.
- Continue to collect and analyze data to determine the impact of curriculum on student learning.

Year 5: Full Implementation/Revision Planning

- Monitor the implementation of curriculum with the new revisions.
- Continue to provide support and staff development
- Identify further areas of revision and amend the curriculum, if necessary.
- Continue to collect and analyze data to determine the impact of curriculum on student learning.
- Plan for new curriculum revision cycle/curriculum evaluation and development.

It is important to note, however, that recent changes in NJ legislature states that if the NJCCCS standards change, no district will be allowed to wait until they are in a curriculum revision year (i.e. year 5 of a five-year curriculum revision cycle) to revise the affected curriculum. Districts will have twelve months from the date the new standards are adopted to update and amend their curriculum documents.

Westampton Township School District
Lesson Plan Template

Teacher: **Subject:** **Week Of:**

M__ T__ W__ T__ F__

1. Standards:

2. Essential Questions:

3. Enduring Understandings:

4. Objectives:

5. Assessment of Objectives:

6. Material/Resources:

7. Instructional Strategies:

8. Support for Special Needs:

9. Closure Activity:

10. Homework:

Westampton Township School District
Curriculum Map Template

School: Subject:
Teacher: Grade Level:

MONTH/YEAR	ESSENTIAL QUESTIONS	CONTENT/CONCEPT	SKILLS	ASSESSMENT	SUGGESTED ACTIVITIES/RESOURCES

Modifications and Extensions: A Guide for Differentiated Instruction

(Formerly Instructional Adaptations in the Classroom for Students with Diverse Needs)

Introduction

The students populating U.S. classrooms today are a diverse lot. They come from differing cultures and have differing learning styles. They arrive at school with differing levels of emotional and social maturity. Their interests differ greatly, both in topic and intensity. At any given time, they reflect differing levels of academic readiness in various subjects-and in various facets of a single subject.

In life, kids can choose from a variety of clothing to fit their differing sizes, styles, and preferences. We understand, without explanation, that this makes them more comfortable and gives expression to their developing personalities. In school, modifying or differentiating instruction for students of differing readiness and interests is also more comfortable, engaging, and inviting. One-size-fits-all instruction will inevitably sag or pinch-exactly as single-size clothing would-student who differ in need, even if they are chronologically the same age.

While the goal for each student is challenge and substantial growth, teachers must often define challenge and growth differently in response to students' varying interests and readiness levels.

– Carol Ann Tomlinson, How to Differentiating Instruction in Mixed-Ability Classrooms

The concept of differentiation, also referred to "differentiating instruction", "differentiated instruction", "differentiated learning", "adaptations", has become an important conversation in teaching and learning. This places students at the center of teaching and learning and upholds data and student needs as the vehicle to drive instructional planning and practices.

"Differentiating the curriculum" requires qualitative, proactive, and multiple approaches to learning in an effort to provide appropriate adjustments to content, teaching strategies, expectations of student mastery, and scope and sequence.

In a differentiated classroom, students work at different paces, have different strengths, and therefore, need instruction that is tailored to meet their individual needs. This need for differentiation is magnified when students have disabilities, are limited in English proficiency, or are advanced and need to be challenged academically to maintain motivation for learning.

This document is designed to offer support to teachers as a resource for strategies to use in their classroom considering that most classroom contain a broad range of levels, skills, and interests. Please note that while this document is categorized to reflect specific student subgroups, many of the strategies can overlap and prove to be effective instructional practices for all students.

Practices that Support Students with Various Needs

(Students include those supported under the umbrella of Special Education. 504 students and at-risk students)

Student Motivation

Rationale: Some students with disabilities and struggling learners may be reluctant to engage or persist in language arts literacy activities. This reluctance may be due to difficulties with aspects of language or literacy processes resulting in repeated failures despite students' initial efforts and desire to learn. Because of these difficulties motivational strategies are important to help students with disabilities become successfully involved in a variety of literacy experiences to develop proficiency, confidence, and enjoyment.

Purpose:	*Strategies:*
Create interest	Personally meaningful activity
Develop persistence	Activity choice
Build confidence	Hands-on, multimodal activities
Promote enjoyment	"Doable" tasks
Foster independence	Attention to learning style
	Student involvement in goal setting
	Modified assessment activities
	Choice to work with others or alone

Instructional Presentation

Rationale: Some students with disabilities and struggling learners may require instructional presentations that will enable them to acquire, comprehend, recall, and apply science content and related processes. In addition, instructional presentation adaptations can enhance a student's attention and ability to focus on instruction.

The primary purpose of these adaptations is to provide special education students with teacher-initiated and teacher-directed interventions that prepare students for learning and engage students in the learning process (*Instructional Preparation)*; structure and organize information (*Instructional Prompts)*; foster understanding of new concepts and processes (*Instructional Application)*; and promote student self-reflection and self-management regarding tasks demands, goal attainment, and performance accuracy (*Instructional Monitoring)*.

Instructional Preparation

Purpose:	*Examples:*
Motivate	Previewing information/materials
Establish purpose and goals of lesson	Advanced organizers
Activate prior knowledge	Brainstorming and webbing
Build background	Questioning techniques
Focus	K-W-L strategies

Organize	Warm-ups Visual demonstrations, illustrations, models Mini-lessons

Instructional Prompts

Purpose:	*Examples:*
Organize information	Graphic organizers
Build whole-part relationships	Semantic organizers
Cue associations and connections	Outlines
Highlight essential concepts	Mnemonics
Generate categorization and comparisons	Analogies
Activate recall	Feature analysis
Summarize	Color coding
	Key words/Labels
	Writing frames/templates
	Restating/clarifying oral directions
	Cue Cards
	Pictures
	Movement cues
	Notetaking guides
	Segmenting/chunking tasks
	Directions on overhead/board

Instructional Application

Purpose:	*Examples:*
Simplify abstract concepts	Graphics and charts
Provide concrete examples	Data charts
Extend ideas and elaborate understanding	Flow charts
Build connections and associations	Drawings and other illustrations
Relate to everyday experiences	Dramatics – role play
Promote generalization	Props and manipulatives
Engage multiple modalities	Field trips
	Games and puzzles
	Models
	Interviews/surveys
	Think aloud - modeling
	Simulations
	Hands-on activities
	Constructions
	Dramatizations
	Music and movement
	Concept activities
	Application activities
	Real-life applications (write letter to editor)

Instructional Monitoring

Purpose:
Provide checks for understanding
Redirect attention
Direct on-task behavior
Promote participation
Check progress
Assist in goal setting
Establish timelines
Clarify assignments, directions, and directions
Provide reinforcement and corrective feedback
Promote strategy use and generalization
Manage student behavior and interactions
Develop self-questioning and self-regulation

Examples:
Self-monitoring checklists
Think-alouds
Journal entries
Portfolios
Interviews
Questioning techniques
Student contracts
Reward system

Instructional Grouping

Purpose:
Cooperative learning groups
Peer partners
Buddy Systems
Teams

Examples:
Assist physically
Clarify
Prompt cue
Gestures and signals
Interpret
Reinforce
Highlight
Organize
Focus

Student Response

Rationale: Some students with disabilities and struggling learners may require specific adaptations in order to demonstrate acquisition, recall, understanding, and application of language arts and other content area procession in a variety of situations with varied materials while they are developing proficiencies in these areas.

The primary purpose of student performance responses is to provide students with disabilities and struggling learners a means of demonstrating process toward the lesson objectives related to the New Jersey Core Curriculum Content Standings.

Response Format Adaptation Examples:

- Dictation
- Use of PC/multimedia for composition of response
- Video and audiotapes

- Braille writing
- Signing with Interpretation
- Information and graphic organizers
- Illustrations
- Diagrams
- Construction – models, dioramas, mobiles
- Songs, raps, and/or poems
- Brochure
- Game or puzzle
- Flip book
- Create test questions

Response Procedure Adaptation Examples:

- Extended time
- Practice Exercises
- Interpreter
- Use of preferred response format

Limited English Proficiency Students

Teachers need to use a variety of strategies for monitoring student progress and to adjust their strategies and expectations to fit the level of language proficiency of the English language learner. With beginning language learners, emphasis should be on comprehension of named things and actions; more advanced students should begin demonstrating understanding of connections between things and subsequently their ability to articulate the relationship between ideas. Content area teachers should work closely with the bilingual/ESL teacher to identify instructional and assessment strategies that are appropriate to all aspects of the student's development and that permit teachers to expand expectations gradually over the school year.

Successful strategies for monitoring student progress in the content areas include:

- Providing periodic checks for understanding.
- Promoting nonverbal as well as verbal participation.
- Encouraging students to think aloud to practice concepts.
- Modeling responses that provide appropriate information using correct grammar.
- Breaking tasks down into sequentially developed parts using simple language.
- Structuring questions to student's language level (e.g., begin with yes/no and embedded questions and advance to open-ended questions).
- Avoiding use of questioning techniques that contain negative structures, such as "all but", "everything is _____ except", or "one is NOT the reason/cause."
- Rephrasing questions and information when students do not understand the first time.
- Observing student's behaviors for evidence that they understand assignments, directions, and instructions.

- Reviewing student's work for evidence that they understand assignments, directions, and instructions.
- Using visual reviews (e.g., lists and charts) that enable students to show what they know and can do.
- Providing increased "wait time" to allow students time to process questions before responding.
- Providing modified "double" grading to assess the content as well as the structure of responses.

Four over-arching strategies are most effective for assisting students from a background of limited English proficiency (LEP) to meet success in content area classes. These strategies include the following:

- integrate activities into thematic units
- tap students' prior knowledge and experience
- teach learning strategies and scaffold complex tasks
- group students into a variety of learning groups

Academically Talented Learners

Academically talented learners, also known as "gifted learners" or "gifted and talented," are oftentimes overlooked in classroom instruction. Consequently, some students find school boring and uninspiring due to knowing many of the concepts being introduced in the regular classroom. The exceptionally able or gifted students are those who

- demonstrate a high degree of intellectual, creative, and/or artistic ability
- possess exceptional leadership skills
- excel in specific fields
- function above grade level
- need accommodations or special instruction to achieve at levels commensurate with a challenge to his or her abilities
- have the ability to grasp concepts rapidly and/or intuitively
- have an intense curiosity about principles and how things work
- have the ability to generate theories and hypotheses and purse methods of inquiry
- produce products that express insight, creativity and/or excellence

In the past, the term "gifted" described people with high scores on I.Q. tests. Today, new concepts connected to creative thinking models and multiple intelligences have expanded the definition of intelligence to include other dimensions. Giftedness reflects a multifaceted, multicultural, and multidimensional perspective and is defined by aptitude, traits, and behaviors rather than changeless test performance. These students are found in all cultural groups and across all economic levels. Increased understanding of culturally determined and environmentally affected behaviors will enable teachers and administrators to interpret performance indicators of creative potential.

Strategies for Academically Talented Learners

Gifted students are more likely to develop study and production skills, experience success and struggle, and feel challenged in a classroom setting that encourages learners to master information more quickly.

Adaptation strategies include the following:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- community involvement
- cultural diversity
- internship, mentorship, and other forms of apprenticeship

Miscellaneous/All Learners

Adaptations in the Classroom Environment

- Classical background music to enhance concentration
- Variety of workspace arrangement (individual, small, and large group)
- Privacy work seats – carrels
- Conferencing area for one-on-one teacher/student interaction
- Charts and poster to enhance memory and self-reliance
- Organization tools – labeled bins or cabinets for materials, assignments, or supplies
- Seating arrangements – minimize distractions, provide positive student models
- Interactive board

Adaptive Equipment and Instructional Materials

- Leveled classroom libraries
- Multimedia books
- Recorded directions
- Voice to text
- Simplified written directions
- Adjusted formats of text
- Computers with adaptive software
- Speech synthesizer
- Communication boards
- Close-captioned video/television

Bibliography

Works Consulted

- NJ Student Learning Standards

The Mathematics Curriculum of the following districts were reviewed during the development of this curriculum document:

- Maple Shade School District
- Lumberton Public Schools
- Medford School District
- Bordentown Public Schools
- Evesham School District
- Hainesport Township Public School