Woodland Park Mathematics Curriculum

Mathematics Curriculum Map

4th Grade

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Course Philosophy and Description

In mathematics, students are engaged through multiple modalities that ensures learning a high quality curriculum and instruction which enables every student to reach their potential understanding. Student will be empowered to succeed with personalized resources that fits each student's interests and growth in the field of mathematics.

Woodland Park's philosophy in mathematics consists of providing hands on activities, differentiated instruction for conceptual mathematical understanding that supports the New Jersey State Learning Standards for grades k-8, and bridging the properties of mathematics to the make real world extensions. Students will learn to address a range of tasks focusing on the application of concepts, skills and understandings. Students will be asked to solve problems involving the key knowledge and skills for their grade level as identified by the NJSLS; express mathematical reasoning and construct a mathematical argument and apply concepts to solve model real world problems. The balanced mathematics instructional model will be used as the basis for all mathematics instruction.

NJSLS Mathematical Practices

Each grade level consists of mathematical standards that were created to balance the procedure and understanding of math topics. The Standards for Mathematical Content are a balanced combination of procedure and understanding. Expectations that begin with the word "understand" are often especially good opportunities to connect the practices to the content. Students who lack understanding of a topic may rely on procedures too heavily. These practices rest on important "proficiencies and processes" that are in alignment to the longstanding mathematical standards in education.

- **Mathematical Practice #1: Make sense of problems and preserver in solving them**. Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to the its solution.
- **Mathematical Practice # 2: Reason abstractly and quantitatively.** Mathematically proficient students make sense of quantities and their relationships in problem situations.
- **Mathematical Practice #3: Construct viable arguments and critique the reason for others**. Mathematically proficient students understand and use state assumptions, definitions, and previously established results in constructing arguments.
- **Mathematical Practice #4: Model with mathematics.** Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace.
- **Mathematical Practice #5: Use appropriate tools strategically**. Mathematically proficient students consider the available tools when solving a mathematical problem.
- **Mathematical Practice # 6: Attend to precision**. Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others.
- **Mathematical Practice # 7: Look for and make use of structure**. Mathematically proficient students look closely to discern a pattern or structure.
- **Mathematical Practice #8: Look for and express regularity in repeated reasoning**. Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts.

Woodland Park Grade Level Overview (as per NJSLS Framework)

In Kindergarten, instructional time should focus on two critical areas: (1) representing and comparing whole numbers, initially with sets of objects; (2) describing shapes and space. More learning time in Kindergarten should be devoted to number than to other topics.

In Grade 1, instructional time should focus on four critical areas: (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones; (3) developing understanding of linear measurement and measuring lengths as iterating length units; and (4) reasoning about attributes of, and composing and decomposing geometric shapes.

In Grade 2, instructional time should focus on four critical areas: (1) extending understanding of base-ten notation; (2) building fluency with addition and subtraction; (3) using standard units of measure; and (4) describing and analyzing shapes.

In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes.

In Grade 4, instructional time should focus on three critical areas: (1) developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; (2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; (3) understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

In Grade 5, instructional time should focus on three critical areas: (1) developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions); (2) extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; and (3) developing understanding of volume.

In Grade 6, instructional time should focus on four critical areas: (1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers; (3) writing, interpreting, and using expressions and equations; and (4) developing understanding of statistical thinking.

In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples.

In Grade 8, instructional time should focus on three critical areas: (1) formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations; (2) grasping the concept of a function and using functions to describe quantitative relationships; (3) analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.

4th Grade Overview:

In Grade 4, instructional time should focus on three critical areas:

(1) Developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends.

a. Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi-digit whole numbers. Depending on the numbers and the context, they select and accurately apply appropriate methods to estimate or mentally calculate products. They develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems. Students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. They select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.

(2) Developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers.

a. Students develop understanding of fraction equivalence and operations with fractions. They recognize that two different fractions can be equal (e.g., 15/9 = 5/3), and they develop methods for generating and recognizing equivalent fractions. Students extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number.

(3) Understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

a. Students describe, analyze, compare, and classify two-dimensional shapes. Through building, drawing, and analyzing two-dimensional shapes, students deepen their understanding of properties of two-dimensional objects and the use of them to solve problems involving symmetry.

Overview of K-8 Mathematics Curriculum Pacing Guide

Titles of Units

	September	October	November	December	January	February	March	April	May	June
Grade K	Counting and Cardinality		Counting and Cardinality/ Operations and Algebraic Thinking			Measurement & Data			Geometry	
Grade 1	Addition and Subtraction within 10				Place Value/ Addition & Subtraction through 20		Place Value, Measurement, & Shapes		Reason with Shape and their Attributes	
Grade 2	Add and Subtract within 100 and Understand Place Value to 1000			Place Value Strategies for Addition and Subtraction		Measurement			Reason with Shapes and Represent Data	
Grade 3	Multiplication, Division and Concepts of Area			Modeling Multiplication, Division and Fractions			Fractions as Numbers and Measurement		Representing Data	
Grade 4	Place Value and Operations with Whole Numbers		Multi-digit Arithmetic and Fraction Equivalence			Building Fractions and Decimal Notation			Geometry and Measurement	
Grade 5	Understanding the Place Value System		Understanding Volume and Operations on Fractions			More Operations on Fractions			Coordinate Geometry and Classifying Figures	
Grade 6	Operations and Reasoning about Ratios		Equations, The Rational Number System and 2D Geometry			Equations, The Rational Number System and 2D Geometry			Variability, Distributions, and Relationships between Quantities	
Grade 7	Operations on Rational Numbers and Expressions			Equations, Ratios and Proportions			Drawing Inferences about Populations and Probability Models		Problem Solving with Geometry	
Grade 8	Exponents, Expressions, and Equations		Functions, Equations, and Solutions			Geometry: Pythagorean Theorem, Congruence and Similarity Transformations			Statistics and Probability: Scatterplots and Association	
Algebra	Solving Equations and Inequalities		Introduction to Functions	Linear Functions/ Inequalities and Systems/Exponential Functions			Polynomials/ Quadratic Functions and Equations		Quadratic Functions and Equations	

4th Grade Pacing Guide	
Mathematics Unit Titles:	
Unit 1: Place Value and Operations with Whole Numbers	**September-October**
Unit 2: Multi-digit Arithmetic and Fraction Equivalence	**November - January**
Unit 3: Building Fractions and Decimal Notation	**February - April**
Unit 4: Geometry and Measurement	**May - June**

Content Area: Numbers and Operations	Grade Level : Fourth
Unit 1: Place Value and Operations with Whole Numbers	Time Frame: September - November

Interdisciplinary Connections

NGSS Connection:

Earth's Place in the Universe

- 4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.2 Reason abstractly and quantitatively.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.4 Model with mathematics.
    - **Cross cutting concepts to NJSLS math standard(s):** 4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; 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.

Earth's Systems

- 4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.2 Reason abstractly and quantitatively.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.4 Model with mathematics.
    - **Cross cutting concepts to NJSLS math standard(s**): MP.5 Use appropriate tools strategically.
    - **Cross cutting concepts to NJSLS math standard(s):** 4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; 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.

Earth and Human Activity

- 4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.2 Reason abstractly and quantitatively.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.4 Model with mathematics.
    - **Cross cutting concepts to NJSLS math standard(s):** 4.OA.A.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-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.2 Reason abstractly and quantitatively.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.4 Model with mathematics.
    - **Cross cutting concepts to NJSLS math standard(s):** 4.OA.A.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.

Engineering Design

- 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
    - **Cross cutting concepts to NJSLS math standard(s):** 3-5.OA Operations and Algebraic Thinking.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.2 Reason abstractly and quantitatively.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.4 Model with mathematics.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.5 Use appropriate tools strategically.

- 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
    - **Cross cutting concepts to NJSLS math standard(s):** 3-5.OA Operations and Algebraic Thinking.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.2 Reason abstractly and quantitatively.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.4 Model with mathematics.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.5 Use appropriate tools strategically.

ELA Connection:

Informational Text Key Ideas and Details

- RI.4.1. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- RI.4.2. Determine the main idea of a text and explain how it is supported by key details; summarize the text.

Integration of Knowledge and Ideas

- RI.4.7. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

Comprehension and Collaboration

- SL.4.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
    - A. Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.
    - B. Follow agreed-upon rules for discussions and carry out assigned roles.
    - C. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
    - D. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
- SL.4.2. Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g.,visually, quantitatively, and orally).

Production and Distribution of Writing

- W.4.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
- W.4.8. Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

Career Ready Practices

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.

9.1 Personal Financial Literacy: By the end of grade 4, students should be able to…

STRAND A: INCOME AND CAREERS
9.1.4.A.2 Identify potential sources of income.

STRAND B: MONEY MANAGEMENT
9.1.4.B.1 Differentiate between financial wants and needs.

9.2 Career Awareness, Exploration, and Preparation: By the end of grade 4, students will be able to…

STRAND A: CAREER AWARENESS

- 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Technology Standards (8.1 and 8.2): grades 3-5

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 and to create and communicate knowledge.

A. Technology Operations and Concepts: *Students demonstrate a sound understanding of technology concepts, systems and operations.*

Understand and use technology systems:

8.1.5.A.1: Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

Select and use applications effectively and productively.

8.1.5.A.3: Use a graphic organizer to organize information about problem or issue.

Unit 1: Place Value and Operations with Whole Numbers

Standards:

4.OA.A. Use the four operations with whole numbers to solve problems.

- 4.OA.A.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.A.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 from additive comparison.

4.NBT.A. Generalize place value understanding for multi-digit whole numbers.

- 4.NBT.A.1. Recognize that in a multi-digit whole number, a digit in one place represents ten 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.* [Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.]
- 4.NBT.A.2. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. [Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.]
- 4.NBT.A.3. Use place value understanding to round multi-digit whole numbers to any place. [Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.]

4.OA.B. Gain familiarity with factors and multiples

- 4.OA.B.4. Find all factor pairs for a whole number in the range 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 1–100 is prime or composite.

4.OA.C. Generate and analyze patterns.

- 4.OA.C.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 the starting 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 in this way.*

4.MD.A. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

- 4.MD.A.1. Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; 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 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36).	
Essential Questions: • How does place value help represent the value of numbers? • What types of problems involve multiplication and division in the answer? • Why do we need factors and multiples? • Why do we need to distinguish a number as being prime or composite? • How does finding factors or multiples of a number help us to solve problems? • How does recognizing a pattern help one to solve problems? • Why does one need to look for patterns?	**Enduring Understanding:** **Learning Goal 1:** Find all factor pairs for a whole number up to 100 and determine whether it is a multiple of a given 1-digit whole number and whether it is prime or composite. **Learning Goal 2:** Generate a number or shape pattern that follows a rule and identify features of the pattern that are not explicit in the rule. **Learning Goal 3:** Express measurement in a larger unit in terms of a smaller unit and record equivalent measures in a two-column table. **Learning Goal 4:** Write multiplication equations from word problems indicating multiplicative comparisons and describe multiplication equations as comparisons. **Learning Goal 5:** Multiply and divide to solve word problems involving multiplicative comparisons and represent these problems with drawings and equations. **Learning Goal 6:** For a whole number up to one million, explain that a digit in one place represents ten times what it would represent in the place to its right. **Learning Goal 7:** Compare two multi-digit whole numbers (up to one million) using >, =, and < for numbers presented as base ten numerals, number names, and/or in expanded form. **Learning Goal 8:** Round multi-digit whole numbers up to one million to any place.
Knowledge and Skills: **Concept 1:** Whole numbers are a multiple of each of its factors. **Concept 2:** Prime numbers do not have factors other than 1 and the number itself.	**Demonstration of Learning:** ***Students are able to: (TLWBAT/SWBAT):*** **Objective 1:** find all factor pairs for any whole number (between 1 and 100). **Objective 2:** given a one-digit number, determine whether a given whole number (between 1 and 100) is a multiple of the one-digit number.

Concept 3: Patterns contain features that are not explicitly stated in the rule defining the numerical pattern. **Concept 4:** Relative sizes of measurements (e.g. a kilometer is 1000 times as long as a meter and 100,000 times as long as a centimeter). **Concept 5:** Multiplication equations represent comparisons. **Concept 6:** A quantitative relationship exists between the digits in place value positions of a multi-digit number. **Concept 7:** Multiple representations of whole numbers exist. **Concept 8:** Estimation	**Objective 3:** determine whether a given whole number (between 1 and 100) is prime or composite. **Objective 4:** produce number patterns from a given rule. **Objective 5:** produce shape patterns from a given rule. **Objective 6:** analyze a sequence of numbers in order to identify features that are not obvious explicitly stated in the rule. **Objective 7:** express measurements of a larger unit in terms of a smaller unit (within a single measurement system) (e.g. convert hours to minutes, kilometers to centimeters, etc). **Objective 8:** generate a two-column table to record measurement equivalents. **Objective 9:** explain multiplication equations as comparisons. **Objective 10:** write multiplication equations given word problems indicating multiplicative comparison and multiply to solve word problems involving multiplicative comparison. **Objective 11:** divide to solve word problems involving multiplicative comparison. **Objective 12:** represent problems with drawings and equations, using a symbol for the unknown number. Round whole numbers to any place. **Objective 13:** distinguish word problems involving multiplicative comparison from those involving additive comparison. Round whole numbers to any place. **Objective 14:** Explain that a digit in one place represents ten times what it would represent in the place to its right. Round whole numbers to any place. **Objective 15:** read and write multi-digit whole numbers using base-ten numerals as well as read and write multi-digit whole numbers using number names. **Objective 16:** read and write multi-digit whole numbers using expanded form.

	Objective 17: compare two multi-digit numbers using >, =, and < symbols.

Core Instructional and Supplemental Materials:	**Technology Integration/ Resources**	**Illustrative Mathematics:**
Carter, John A., Ph.D., Cuevas, Gilbert Ph.D., Day, Roger Ph.D., Malloy, Carol Ph.D. *McGraw-Hill Education: My Math grades k-5*. McGraw-Hill Education, 2016. www.connectED.mcgraw-hill.com • "Model the Math" activities in Teacher Edition for each lesson • "Literature Connection" found in Teacher Edition for each lesson • "Real-World Problem Solving Reader" • RTI Differentiated Instruction / ELL Support for each chapter • Laptops • Math centers/stations • Video tutorials for anticipatory set/guided visuals • Anchor charts created by teachers • Reference sheets created by teachers • Vocabulary Activities/Math Word Wall • Problem of the day(s)/Weeks	• SmartBoard • https://smart.wikispaces.hcpss.org/Grade+4 • www.edhelper.com • www.ixl.com • www.illuminations.nctm.org • www.internet4classrooms.com • www.mathplayground.com • www.adaptedmind.com • www.softschools.com • www.khanacademy.com • www.teachertube.com • www.superteacherworksheets.com • www.enchantedlearning.com • www.teacherspayteachers.com • www.xtramath.org • www.sumdog.com • www.smartexchange.com • www.teacherled.com	• 4.OA.B Identifying Multiples • 4.OA.B Numbers in a Multiplication Table • 4.OA.C.5 Double Plus One • 4.MD.A.1 Who is the tallest? • 4.OA.A.2 Comparing Money Raised • 4.NBT.A.1 Thousands and Millions of Fourth Graders • 4.NBT.A.2 Ordering 4-digit numbers • 4.NBT.A.3 Rounding on the Number Line

Suggested Activities:	Am I Ready McGraw-Hill: My Math Grade 4 Problem of the Day; Common Core Quick Check (McGraw-Hill: My Math Grade 4 Chapter 1) Introduce vocabulary words from McGraw-Hill: My Math Grade 4 Chapter 1- Place Value: digit, expanded form, is equal to (=), is greater than (>), is less than (<), number line, period, place value Create foldable for place value chart to make numbers up to the millions place.	Use digit cards to create interactive experience building and rounding numbers. Make two sets of digits cards 0 – 9 including 2 commas. Create two teams and have them compete to correctly form the given number by arranging themselves accordingly. Using a place value chart, students will try to make the largest number possible. The teacher will roll a 10 –sided die and students will place each digit into
Math At Home Letters (McGraw-Hill: My Math Grade 4 – print from online) Watch video McGraw-Hill: My Math Grade 4 Chapter 1- Place Value (connected.mcgraw-hill.com) Review vocabulary words to show what they know – ten thousands, thousands, hundreds, tens, ones.		

		the chart when rolled. Once written down, the student cannot change placement. The student(s) with the largest number possible wins that round. Students will complete a table with column headings of standard, word, and expanded form.

Formative/Summative/Benchmark Assessments:

Diagnostic Assessment (as Pre-Assessment): Assesses a student's strengths, weaknesses, knowledge, and skills prior to instruction.

- STAR 360**,** iXL, Pre-assessments per grade level
- Summer packet review
- Daily Problem of the Day
- Diagnostic Pre-Chapter Assessment "Am I Ready" for each chapter

Formative Assessments: Assesses a student's performance during instruction, and usually occurs regularly throughout the instruction process.

- Writing Prompts, Journals, and Portfolios, Do-Now(s), Exit Tickets, iXL (performance assessments), Hands on Labs, Projects, Menu Choice boards, Anticipatory Sets, Problem of the Week

Summative Assessments: Measures a student's achievement at the end of instruction.

- Diagnostic Quizzes, Activities, Tasks, Challenge Problems, Unit Tests, Chapter Tests, End of Unit Writing Submissions, End of Unit Projects, Benchmark Assessments, midterms and finals (if applicable per grade level)
- Assessment Masters – Diagnostic Test for each unit Chapter Test – on level (2A)
- STAR 360 benchmark assessments

Criterion-Referenced Assessment: Measures a student's performance against a goal, specific objective, or standard.

Norm-Referenced Assessment: Compares a student's performance against other students (a national group or other "norm")

- Alternate Assessments

Interim/Benchmark Assessment

- Evaluates student performance at periodic intervals, frequently at the end of a grading period. Can predict student performance on end-of-the-year summative assessments.

Unit 1: Differentiation/Accommodations/Modifications

	Content Curriculum, standards	**Process** How students make sense or understand information being taught	**Product** Evidence of Learning
G&T	❖ Compacting ❖ Flexible grouping ❖ Independent study/set own learning goals ❖ Interest/station groups ❖ Varying levels of resources and materials ❖ Use of technology	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, multiple choice, open ended… ❖ Centers/Stations ❖ Use of technology ❖ Journals/Logs	❖ Choice boards ❖ Podcast/blog ❖ Debate ❖ Design and conduct experiments ❖ Formulate & defend theory ❖ Design a game ❖ Rubrics
ELL	❖ Compacting ❖ Flexible grouping ❖ Controlled choice ❖ Multi-sensory learning-auditory, visual, kinesthetic, tactile ❖ Pre-teach vocabulary ❖ Vocabulary lists ❖ Visuals/Modeling ❖ Varying levels of resources and materials ❖ Use of technology	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, choice, open ended… ❖ Centers/Stations ❖ Scaffolding ❖ Chunking ❖ E-Dictionaries, bilingual dictionaries ❖ Extended time ❖ Differentiated instructional outcomes ❖ Use of technology ❖ Frequent checks for understanding	❖ Rubrics ❖ Simple to complex ❖ Group tasks ❖ Quizzes, tests with various types of questions ❖ Generate charts or diagrams to show what was learned ❖ Act out or role play
At Risk	❖ Compacting ❖ Flexible grouping ❖ Controlled choice ❖ Multi-sensory learning-auditory, visual, kinesthetic, tactile ❖ Pre-teach vocabulary ❖ Vocabulary lists ❖ Visuals/Modeling Varying levels of resources and materials ❖ Use of technology	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, multiple choice, open ended… ❖ Centers/Stations ❖ Scaffolding ❖ Chunking ❖ Extended time ❖ Differentiated instructional outcomes ❖ Use of technology ❖ Partner work ❖ Frequent checks for understanding	❖ Rubrics ❖ Simple to complex ❖ Group tasks ❖ Quizzes, tests ❖ Oral Assessments ❖ Generate charts or diagrams to show what was learned ❖ Act out or role play
IEP/504	❖ Compacting ❖ Flexible grouping ❖ Controlled choice ❖ Multi-sensory learning-auditory, visual, kinesthetic, tactile ❖ Pre-teach vocabulary ❖ Visuals/Modeling Varying levels of resources and materials	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, multiple choice, open ended… ❖ Centers/Stations ❖ Scaffolding ❖ Extended time ❖ Differentiated instructional outcomes ❖ Preferential Seating	❖ Rubrics ❖ Simple to complex ❖ Group tasks ❖ Quizzes, tests ❖ Oral Assessments ❖ Generate charts or diagrams to show what was learned ❖ Act out or role play

	❖ Use of technology ❖ Provide word boxes ❖ Use of a calculator ❖ Present fewer multiple choice answers ❖ Acknowledge alternate responses such as pictures and/or verbal instead of written ❖ Teacher may scribe for student ❖ Oral assessment instead of written	❖ Use of technology ❖ Small group/one-to-one instruction ❖ Teach information processing strategies ❖ Chunking ❖ Frequent checks for understanding ❖ Access to teacher created notes ❖ Use of visual and multisensory formats ❖ Use of assistive technology ❖ Use of prompts ❖ Vocabulary walls and anchor charts available ❖ Provide a Study Guide ❖ Graphic organizers ❖ Teacher modeling or anchor charts on board ❖ Provide multi-level reading material ❖ Chunk learning into smaller segments ❖ Small group instruction	

Instructional Routines for Core Instructional Delivery

Collaborative Problem Solving Connect Previous Knowledge to New Learning Making Thinking Visible Develop and Demonstrate Mathematical Practices Inquiry-Oriented and Exploratory Approach Multiple Solution Paths and Strategies	Use of Multiple Representations Explain the Rationale of your Math Work Quick Writes Pair/Trio Sharing Turn and Talk Charting Gallery Walks Small Group and Whole Class Discussions Student Modeling	Analyze Student Work Identify Student's Mathematical Understanding Identify Student's Mathematical Misunderstandings Interviews Role Playing Diagrams, Charts, Tables, and Graphs Anticipate Likely and Possible Student Responses Collect Different Student Approaches	Multiple Response Strategies Asking Assessing and Advancing Questions Revoicing Marking Recapping Challenging Pressing for Accuracy and Reasoning Maintain the Cognitive Demand

Content Area: Numbers and Operations	Grade Level : Fourth
Unit 2: Multi-Digit Arithmetic and Fraction Equivalence	Time Frame: November - January

Interdisciplinary Connections

NGSS Connection:

Energy

- 4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.
    - **Cross cutting concepts to NJSLS math standard(s):** 4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the 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.

Engineering Design

- 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
    - **Cross cutting concepts to NJSLS math standard(s):** 3-5.OA Operations and Algebraic Thinking.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.2 Reason abstractly and quantitatively.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.4 Model with mathematics.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.5 Use appropriate tools strategically.

- 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
    - **Cross cutting concepts to NJSLS math standard(s):** 3-5.OA Operations and Algebraic Thinking.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.2 Reason abstractly and quantitatively.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.4 Model with mathematics.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.5 Use appropriate tools strategically.

ELA Connection:

Informational Text Key Ideas and Details

- RI.4.1. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- RI.4.2. Determine the main idea of a text and explain how it is supported by key details; summarize the text.

Integration of Knowledge and Ideas

- RI.4.7. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

Comprehension and Collaboration

- SL.4.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
    - A. Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.
    - B. Follow agreed-upon rules for discussions and carry out assigned roles.
    - C. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
    - D. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
- SL.4.2. Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g.,visually, quantitatively, and orally).

Production and Distribution of Writing

- W.4.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
- W.4.8. Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

Career Ready Practices

CRP4. Communicate clearly and effectively and with reason.
Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.

CRP6. Demonstrate creativity and innovation.
Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.

9.1 Personal Financial Literacy: By the end of grade 4, students should be able to…

STRAND A: INCOME AND CAREERS
9.1.4.A.2 Identify potential sources of income.
9.1.4.A.3 Explain how income affects spending and take-home pay.

STRAND B: MONEY MANAGEMENT
9.1.4.B.3 Explain what a budget is and why it is important.

STRAND E: BECOMING A CRITICAL CONSUMER
9.1.4.E.2 Apply comparison shopping skills to purchasing decisions.

9.2 Career Awareness, Exploration, and Preparation: By the end of grade 4, students will be able to…

STRAND A: CAREER AWARENESS

- 9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.
- 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Technology Standards (8.1 and 8.2): grades 3-5

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 and to create and communicate knowledge.

B. Technology Operations and Concepts: *Students demonstrate a sound understanding of technology concepts, systems and operations.*

Understand and use technology systems:

8.1.5.A.1: Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

Select and use applications effectively and productively.

8.1.5.A.3: Use a graphic organizer to organize information about problem or issue.

Unit 2: Multi-Digit Arithmetic and Fraction Equivalence

Standards:

4.NBT.B. Use place value understanding and properties of operations to perform multi-digit arithmetic.

- 4.NBT.B.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm. *[Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.] ***(benchmarked)**
- 4.NBT.B.5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two 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. [Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.]
- 4.NBT.B.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 area models. [Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.]

4.OA.A. Use the four operations with whole numbers to solve problems.

- 4.OA.A.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the 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. ***(benchmarked)**

4.NF.A. Extend understanding of fraction equivalence and ordering.

- 4.NF.A.1. Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ 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. [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.]
- 4.NF.A.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 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.]

4.NF.B. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

- 4.NF.B.3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.
  - 4.NF.B.3(a). Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
  - 4.NF.B.3(b). 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: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.* [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.]

4.MD.A. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

- 4.MD.A.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.***

Essential Questions:	**Enduring Understanding:**
• How do understanding place value and the properties of addition and multiplication help when performing multi-digit arithmetic? • How do understanding place value and the rules of subtraction and division help when performing multi-digit arithmetic? • How can you use the four operations to solve problems in arithmetic? • How can writing equations help you to solve a multi-step word problem? • How can estimation strategies help to check for reasonableness? • How can finding area and perimeter help when solving real world problems? • How can modeling help you to generate equivalent fractions? • How can numerators or denominators help you when comparing fractions? • How can decomposing fractions in multiple ways help you to justify your equation?	**<u>Learning Goal 1</u>**: Fluently add and subtract multi-digit whole numbers using the standard algorithm. **<u>Learning Goal 2</u>**: Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers; represent and explain calculations using equations, rectangular arrays, and area models. **<u>Learning Goal 3</u>**: Divide a whole number of up to four-digits by a one-digit divisor; represent and explain the calculation using equations, rectangular arrays, and area models. **<u>Learning Goal 4</u>**: Write and solve each equation (including any of the four operations) in order to solve multi-step word problems, using a letter to represent the unknown; interpret remainders in context and assess the reasonableness of answers using mental computation with estimation strategies. **<u>Learning Goal 5</u>**: Solve real world problems with whole numbers by finding the area and perimeter of rectangles using formulas. **<u>Learning Goal 6</u>**: Recognize and generate equivalent fractions and explain why they are equivalent using visual fraction models. **<u>Learning Goal 7</u>**: Compare two fractions with different numerators or different denominators, recording comparison with >, =, or <, and justifying the conclusion using visual fraction models. **<u>Learning Goal 8</u>**: Decompose a fraction into a sum of fractions with the same denominator in more than one way and record the decomposition as an equation; justify the decomposition with a visual fraction model.

Knowledge and Skills:	**Demonstration of Learning:** ***Students are able to: (TLWBAT/SWBAT):***
Concept 1: Proper use of the equal sign **Concept 2**: Improper use of the equal sign (e.g. 3 + 7 = 10 – 5 = 5 is incorrect) **Concept 3**: Equivalent fractions are the same size while the number and size of the parts differ. **Concept 4**: Fractions may only be compared when the two fractions refer to the same whole. **Concept 5**: Some fractions can be decomposed. **Concept 6**: Addition/subtraction of fractions is joining/separating parts referring to the same whole.	**Objective 1**: add multi-digit whole numbers using the standard algorithm with accuracy and efficiency. **Objective 2**: subtract multi-digit whole numbers using the standard algorithm with accuracy and efficiency **Objective 3**: multiply a whole number of up to four digits by a one-digit whole number using strategies based on place values. **Objective 4**: multiply two two-digit numbers using strategies based on place value. **Objective 5**: represent these operations with equations, rectangular arrays, and area models. **Objective 6**: explain the calculation by referring to the model (equation, array, or area model). **Objective 7**: 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 the relationship between multiplication and division. **Objective 8**: represent these operations with equations, rectangular arrays, and area models. **Objective 9**: explain the calculation by referring to the model (equation, array, or area model). **Objective 10**: solve multi-step word problems involving any of the four operations. Solve multi-step word problems involving interpretation (in context) of a remainder.

	Objective 11: write equations to represent multi-step word problems, using a letter to represent the unknown quantity. **Objective 12**: explain why an answer is reasonable. **Objective 13**: use mental computation and estimation strategies to determine whether an answer is reasonable **Objective 14**: solve real world and mathematical problems by finding the area of rectangles using a formula. **Objective 15**: solve real world and mathematical problems by finding the perimeter of rectangles using a formula. **Objective 16**: explain, using visual fraction models, why two fractions are equivalent. **Objective 17**: generate equivalent fractions, using fraction a/b as equivalent to fraction $(n \times a)/(n \times b)$. **Objective 18**: create common denominators and numerators in order to compare two fractions. **Objective 19**: compare two fractions with different numerators and different denominators by comparing to a benchmark fraction. **Objective 20**: record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. **Objective 21**: decompose a fraction into a sum of fractions with the same denominator in more than one way. **Objective 22**: write decompositions of fractions as an equation.

	Objective 23: develop visual fraction models that represent decomposed fractions and use them to justify decompositions.	
Core Instructional and Supplemental Materials: Carter, John A., Ph.D., Cuevas, Gilbert Ph.D., Day, Roger Ph.D., Malloy, Carol Ph.D.. *McGraw-Hill Education: My Math grades k-5*. McGraw-Hill Education, 2016. www.connectED.mcgraw-hill.com • "Model the Math" activities in Teacher Edition for each lesson • "Literature Connection" found in Teacher Edition for each lesson • "Real-World Problem Solving Reader" • RTI Differentiated Instruction / ELL Support for each chapter • Laptops • Math centers/stations • Video tutorials for anticipatory set/guided visuals • Anchor charts created by teachers • Reference sheets created by teachers • Vocabulary Activities/Math Word Wall • Problem of the day(s)/Weeks	**Technology Integration/ Resources:** • www.connectED.mcgraw-hill.com • Smart board • www.edhelper.com • www.ixl.com • www.multiplication.com • www.internet4classrooms.com • www.mathplayground.com • www.softschools.com • www.KhanAcademy.com • www.Superteacherworksheets.com • www.xtramath.org • www.sumdog.com • http://exchange.smarttech.com/ • www.teacherled.com • https://play.prodigygame.com/ • https://www.mrnussbaum.com/ • https://www.abcya.com/ • http://www.mathbuddyonline.com/ • https://www.aaamath.com/ • https://www.math-drills.com/	**Illustrative Mathematics:** 4.NBT.B To regroup or not to regroup 4.NBT.B.6 mental Division Strategy 4.OA.A.3, 4.MD.A.3 Karl's Garden 4.NF.A.1 Explaining Fraction Equivalence with Pictures 4.NF.A.1 Fractions and Rectangles 4.NF.A.2 Comparing Fractions Using Benchmarks Game 4.NF.A.2 Doubling Numerators and Denominators 4.NF.B.3a Comparing Sums of Unit Fractions 4.NF.B.3b making 22 Seventeenths in Different Ways

Suggested Activities: Use base-ten blocks to show multiplication as repeated addition. Divide base-ten blocks onto paper plates to show equal groups for division. Connecting cubes Base-ten blocks	Number Cubes/Playing Cards to generate problems for addition, subtraction, multiplication, and division. Use place-value charts to correctly align numbers when adding or subtracting.	Value Chart Counters Spinners Playing Cards/Uno Cards Four-Step Problem-Solving Plan graphic organizer – McGraw-Hill Multiplication/Division flash cards

Place-Value charts Number cubes Grid/Graph paper Play Money Mc-Graw Hill Work Mats – Number Lines, Place- Fraction Tiles/Circles Fraction Sundae Activity Dominoes Fraction Strips	Create computational problems with missing numbers. Students will need to work through the problem to determine missing numbers. Use cards to round numbers to estimate given computational problems. Use number charts to determine patterns.	Multiplication/Division Charts

Formative/Summative/Benchmark Assessments:

Diagnostic Assessment (as Pre-Assessment): Assesses a student's strengths, weaknesses, knowledge, and skills prior to instruction.

- STAR 360**,** iXL, Pre-assessments per grade level
- Summer packet review
- Daily Problem of the Day
- Diagnostic Pre-Chapter Assessment "Am I Ready" for each chapter

Formative Assessments: Assesses a student's performance during instruction, and usually occurs regularly throughout the instruction process.

- Writing Prompts, Journals, and Portfolios, Do-Now(s), Exit Tickets, iXL (performance assessments), Hands on Labs, Projects, Menu Choice boards, Anticipatory Sets, Problem of the Week

Summative Assessments: Measures a student's achievement at the end of instruction.

- Diagnostic Quizzes, Activities, Tasks, Challenge Problems, Unit Tests, Chapter Tests, End of Unit Writing Submissions, End of Unit Projects, Benchmark Assessments, midterms and finals (if applicable per grade level)
- Assessment Masters – Diagnostic Test for each unit Chapter Test – on level (2A)
- STAR 360 benchmark assessments

Criterion-Referenced Assessment: Measures a student's performance against a goal, specific objective, or standard.

Norm-Referenced Assessment: Compares a student's performance against other students (a national group or other "norm")

- Alternate Assessments

Interim/Benchmark Assessment

- Evaluates student performance at periodic intervals, frequently at the end of a grading period. Can predict student performance on end-of-the-year summative assessments.

Unit 2: Differentiation/Accommodations/Modifications

	Content Curriculum, standards	**Process** How students make sense or understand information being taught	**Product** Evidence of Learning
G&T	❖ Compacting ❖ Flexible grouping ❖ Independent study/set own learning goals ❖ Interest/station groups ❖ Varying levels of resources and materials ❖ Use of technology	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, multiple choice, open ended… ❖ Centers/Stations ❖ Use of technology ❖ Journals/Logs	❖ Choice boards ❖ Podcast/blog ❖ Debate ❖ Design and conduct experiments ❖ Formulate & defend theory ❖ Design a game ❖ Rubrics
ELL	❖ Compacting ❖ Flexible grouping ❖ Controlled choice ❖ Multi-sensory learning-auditory, visual, kinesthetic, tactile ❖ Pre-teach vocabulary ❖ Vocabulary lists ❖ Visuals/Modeling ❖ Varying levels of resources and materials ❖ Use of technology	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, choice, open ended… ❖ Centers/Stations ❖ Scaffolding ❖ Chunking ❖ E-Dictionaries, bilingual dictionaries ❖ Extended time ❖ Differentiated instructional outcomes ❖ Use of technology ❖ Frequent checks for understanding	❖ Rubrics ❖ Simple to complex ❖ Group tasks ❖ Quizzes, tests with various types of questions ❖ Generate charts or diagrams to show what was learned ❖ Act out or role play
At Risk	❖ Compacting ❖ Flexible grouping ❖ Controlled choice ❖ Multi-sensory learning-auditory, visual, kinesthetic, tactile ❖ Pre-teach vocabulary ❖ Vocabulary lists ❖ Visuals/Modeling Varying levels of resources and materials ❖ Use of technology	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, multiple choice, open ended… ❖ Centers/Stations ❖ Scaffolding ❖ Chunking ❖ Extended time ❖ Differentiated instructional outcomes ❖ Use of technology ❖ Partner work ❖ Frequent checks for understanding	❖ Rubrics ❖ Simple to complex ❖ Group tasks ❖ Quizzes, tests ❖ Oral Assessments ❖ Generate charts or diagrams to show what was learned ❖ Act out or role play
IEP/504	❖ Compacting ❖ Flexible grouping ❖ Controlled choice ❖ Multi-sensory learning-auditory, visual, kinesthetic, tactile ❖ Pre-teach vocabulary ❖ Visuals/Modeling Varying levels of resources and materials	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, multiple choice, open ended… ❖ Centers/Stations ❖ Scaffolding ❖ Extended time ❖ Differentiated instructional outcomes ❖ Preferential Seating	❖ Rubrics ❖ Simple to complex ❖ Group tasks ❖ Quizzes, tests ❖ Oral Assessments ❖ Generate charts or diagrams to show what was learned ❖ Act out or role play

	❖ Use of technology ❖ Provide word boxes ❖ Use of a calculator ❖ Present fewer multiple choice answers ❖ Acknowledge alternate responses such as pictures and/or verbal instead of written ❖ Teacher may scribe for student ❖ Oral assessment instead of written	❖ Use of technology ❖ Small group/one-to-one instruction ❖ Teach information processing strategies ❖ Chunking ❖ Frequent checks for understanding ❖ Access to teacher created notes ❖ Use of visual and multisensory formats ❖ Use of assistive technology ❖ Use of prompts ❖ Vocabulary walls and anchor charts available ❖ Provide a Study Guide ❖ Graphic organizers ❖ Teacher modeling or anchor charts on board ❖ Provide multi-level reading material ❖ Chunk learning into smaller segments ❖ Small group instruction	

Instructional Routines for Core Instructional Delivery

Collaborative Problem Solving Connect Previous Knowledge to New Learning Making Thinking Visible Develop and Demonstrate Mathematical Practices Inquiry-Oriented and Exploratory Approach Multiple Solution Paths and Strategies	Use of Multiple Representations Explain the Rationale of your Math Work Quick Writes Pair/Trio Sharing Turn and Talk Charting Gallery Walks Small Group and Whole Class Discussions Student Modeling	Analyze Student Work Identify Student's Mathematical Understanding Identify Student's Mathematical Misunderstandings Interviews Role Playing Diagrams, Charts, Tables, and Graphs Anticipate Likely and Possible Student Responses Collect Different Student Approaches	Multiple Response Strategies Asking Assessing and Advancing Questions Revoicing Marking Recapping Challenging Pressing for Accuracy and Reasoning Maintain the Cognitive Demand

Content Area: Numbers and Operations with Measurement and Data	Grade Level : Fourth
Unit 3: Building Fractions and Decimal Notation	Time Frame: February – April

Interdisciplinary Connections

NGSS Connection:

Earth's Systems

- 4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.2 Reason abstractly and quantitatively.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.4 Model with mathematics.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.5 Use appropriate tools strategically.
    - **Cross cutting concepts to NJSLS math standard(s):** 4.MD.A.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-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.
    - **Cross cutting concepts to NJSLS math standard(s):** 4.MD.A.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.

ELA Connection:

Informational Text Key Ideas and Details

- RI.4.1. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- RI.4.2. Determine the main idea of a text and explain how it is supported by key details; summarize the text.

Integration of Knowledge and Ideas

- RI.4.7. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

Comprehension and Collaboration

- SL.4.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
    - A. Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.
    - B. Follow agreed-upon rules for discussions and carry out assigned roles.
    - C. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
    - D. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
- SL.4.2. Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g.,visually, quantitatively, and orally).

Production and Distribution of Writing

- W.4.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
- W.4.8. Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

Career Ready Practices

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.

CRP12. Work productively in teams while using cultural global competence.
Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

9.1 Personal Financial Literacy: By the end of grade 4, students should be able to…

STRAND A: INCOME AND CAREERS
9.1.4.A.1 Explain the difference between a career and a job, and identify various jobs in the community and the related earnings.
9.1.4.A.2 Identify potential sources of income.
9.1.4.A.3 Explain how income affects spending and take-home pay.

9.2 Career Awareness, Exploration, and Preparation: By the end of grade 4, students will be able to…

STRAND A: CAREER AWARENESS

- 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Technology Standards (8.1 and 8.2): grades 3-5

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 and to create and communicate knowledge.

C. Technology Operations and Concepts: *Students demonstrate a sound understanding of technology concepts, systems and operations.*

Understand and use technology systems:

8.1.5.A.1: Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

Select and use applications effectively and productively.

8.1.5.A.3: Use a graphic organizer to organize information about problem or issue.

Unit 3: Building Fractions and Decimal Notation

Standards:

4.NF.B. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

- 4.NF.B.3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.
  - 4.NF.B.3(c). 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.B.3(d). 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. [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.]
- 4.NF.B.4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
  - 4.NF.B.4(a). Understand a fraction a/b as a multiple of $1/b$. *For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).*
  - 4.F.4.B.4(b). 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 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)*
  - 4.NF.4.B.4(c). 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?* [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.]

4.NF.C. Understand decimal notation for fractions, and compare decimal fractions.

- 4.NF.C.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, and add 3/10 + 4/100 = 34/100.* [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.]
- 4.NF.C.6. Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.* [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.]
- 4.NF.C.7. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model. [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.]

B. Use place value understanding and properties of operations to perform multi-digit arithmetic

- 4.NBT.B.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm. [Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.]

4.MD.A. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

- ☐ 4.MD.A.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.B. Represent and interpret data.

- ☐ 4.MD.B.4. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). 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 shortest specimens in an insect collection*

Essential Questions:

- How does recognizing like fractions help you add and subtract mixed numbers?
- How does replacing mixed numbers with equivalent fractions help you add and subtract mixed numbers with like denominators?
- How does using visual fraction models and equations help you solve world problems involving addition and subtraction?
- How does using visual fraction models and equations help you solve world problems involving multiplication of whole numbers and fractions?
- How does knowing the equivalence between tenths and hundredths help you solve problems?
- How does the equivalence between fractions and decimals help you to solve problems?
- How does understanding place value help you to compare decimals?
- How does the standard algorithm help you fluently add and subtract multi-digit whole numbers?
- How does the understanding
- How does making line plots help you solve problems involving addition and subtraction of fractions with like denominators.
-

Enduring Understanding:

Learning Goal 1: Add and subtract mixed numbers with like denominators by replacing each mixed number with an equivalent fraction or improper fraction.

Learning Goal 2: Solve word problems involving addition and subtraction of fractions having like denominators using visual fraction models and equations to represent the problem.

Learning Goal 3: Multiply a fraction by a whole number using visual fraction models and equations, demonstrating a fraction *a/b* as a multiple of 1*/b.*

Learning Goal 4: Multiply a fraction by a whole number, using a visual fraction model and equations to demonstrate that a multiple of *a/b* is the product of 1*/b* and a whole number.

Learning Goal 5: Solve 1-step word problems involving multiplication of a fraction by a whole number, using visual fraction models and equations to represent the problem**.**

Learning Goal 6: Add two fractions with respective denominators of 10 and 100 by writing each fraction with denominator 100.

Learning Goal 7: Given decimal notation, write fractions having denominators of 10 or 100.

	<u>Learning Goal 8</u>: Compare two decimals to hundredths by reasoning about their size, demonstrating that comparisons are valid only when the two decimals refer to the same whole; record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model. **<u>Learning Goal 9</u>**: Fluently add and subtract multi-digit whole numbers using the standard algorithm. **<u>Learning Goal 10</u>**: Solve word problems involving simple fractions or decimals that incorporate measurement comparisons of like units (including problems that require measurements given in a larger unit in terms of a smaller unit). **<u>Learning Goal 11</u>**: Make a line plot to display a data set in measurements in fractions of a unit (1/2, 1/4, 1/8) and use it to solve problems involving addition and subtraction of fractions with like denominators.
Knowledge and Skills: **<u>Concept 1</u>**: Some fractions can be decomposed. **<u>Concept 2</u>**: Addition/subtraction of fractions is joining/separating parts referring to the same whole. **<u>Concept 3</u>**: Fraction Multiplication: any fraction *a*/*b* as a multiple of fraction 1/*b.* **<u>Concept 4</u>**: Fraction Multiplication: any multiple of fraction *a/b* is also a multiple of fraction 1*/b.* **<u>Concept 5</u>**: Equivalent Fractions. **<u>Concept 6</u>**: Relationship between place value (decimals) and fraction.	**Demonstration of Learning:** ***Students are able to: (TLWBAT/SWBAT):*** **<u>Objective 1:</u>** add and subtract fractions having like denominators in order to solve real world problems. **<u>Objective 2:</u>** develop visual fraction models and write equations to represent real world problems involving addition and subtraction of fractions. **<u>Objective 3:</u>** add and subtract mixed numbers with like denominators. **<u>Objective 4:</u>** given a data set consisting of measurements in fractions of a unit, create a line plot. **<u>Objective 5:</u>** using measurement information presented in line plots, add and subtract fractions with like denominators in order to solve problems. **<u>Objective 6:</u>** represent *a/b* as a x (1*/b*) using a visual fraction model.

	Objective 7: represent *n × (a/b) as (n × a)/b* in a visual fraction model. **Objective 8:** multiply a fraction by a whole number. **Objective 9:** solve real world problems by multiplying a fraction by a whole number, using visual fraction models and equations to represent the problem. **Objective 10:** add two fractions with respective denominators of 10 and 100 using equivalent fractions. **Objective 11:** write a decimal as a fraction that has a denominator of 10 or 100. **Objective 12:** represent a decimal using a model. **Objective 13:** compare two decimals to hundredths by reasoning about their size. **Objective 14:** explain that comparisons are valid only when the two decimals refer to the same whole. **Objective 15:** record the results of comparisons with the symbols >, =, or <, and justify the conclusions (e.g., by using a visual model). **Objective 16:** solve word problems (using addition, subtraction and multiplication) involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals. **Objective 17:** solve word problems (using all four operations) involving whole number distances, intervals of time, liquid volumes, masses of objects, and money, including problems requiring expressing measurements given in a larger measurement unit in terms of a smaller measurement unit (conversion). **Objective 18:** construct diagrams (e.g. number line diagrams) to represent measurement quantities.

	Objective 19: add using the standard algorithm with accuracy and efficiency. **Objective 20:** subtract using the standard algorithm with accuracy and efficiency.	
Core Instructional and Supplemental Materials: Carter, John A., Ph.D., Cuevas, Gilbert Ph.D., Day, Roger Ph.D., Malloy, Carol Ph.D.. *McGraw-Hill Education: My Math grades k-5*. McGraw-Hill Education, 2016. • "Model the Math" activities in Teacher Edition for each lesson • "Literature Connection" found in Teacher Edition for each lesson • "Real-World Problem Solving Reader" • RTI Differentiated Instruction / ELL Support for each chapter • Laptops • Fraction Manipulatives • Fraction tiles • Fraction strips • Interactive games such as dominoes • Matching cards • Uno cards • Charts/whiteboards • Word wall	**Technology Integration/ Resources:** • www.connectED.mcgraw-hill.com • Smart board • www.edhelper.com • www.ixl.com • www.multiplication.com • www.internet4classrooms.com • www.mathplayground.com • www.softschools.com • www.KhanAcademy.com • www.Superteacherworksheets.com • www.xtramath.org • www.sumdog.com • http://exchange.smarttech.com/ • www.teacherled.com • https://play.prodigygame.com/ • https://www.mrnussbaum.com/ • https://www.abcya.com/ • http://www.mathbuddyonline.com/ • https://www.aaamath.com/ • https://www.math-drills.com/	**Illustrative Mathematics:** 4.NF.B.3c Cynthia's Perfect Punch 4.NF.B.3c Peaches 4.MD.B.4 Button Diameters 4.NF.B.4 Extending Multiplication From Whole Numbers to Fractions 4.NF.B.4c Sugar in six cans of soda 4.NF.C.5 Adding Tenths and Hundredths 4.NF.C.6 Dimes and Pennies 4.NF.C.6 Expanded Fractions and Decimals 4.NF.C.7 Using Place Value 4.MD.A.2 Margie Buys Apples
Suggested Activities: Kahoot activities Socrative-entry tickets/ exit tickets	Fraction tiles used to practice recognition of unit fractions. Dominos used to practice matching up equivalent fractions	Fraction Sundae to show parts of a whole. Quizlet to reinforce new learned material

Formative/Summative/Benchmark Assessments:

Diagnostic Assessment (as Pre-Assessment): Assesses a student's strengths, weaknesses, knowledge, and skills prior to instruction.

- STAR 360**,** iXL, Pre-assessments per grade level
- Summer packet review
- Daily Problem of the Day
- Diagnostic Pre-Chapter Assessment "Am I Ready" for each chapter

Formative Assessments: Assesses a student's performance during instruction, and usually occurs regularly throughout the instruction process.

- Writing Prompts, Journals, and Portfolios, Do-Now(s), Exit Tickets, iXL (performance assessments), Hands on Labs, Projects, Menu Choice boards, Anticipatory Sets, Problem of the Week

Summative Assessments: Measures a student's achievement at the end of instruction.

- Diagnostic Quizzes, Activities, Tasks, Challenge Problems, Unit Tests, Chapter Tests, End of Unit Writing Submissions, End of Unit Projects, Benchmark Assessments, midterms and finals (if applicable per grade level)
- Assessment Masters – Diagnostic Test for each unit Chapter Test – on level (2A)
- STAR 360 benchmark assessments

Criterion-Referenced Assessment: Measures a student's performance against a goal, specific objective, or standard.

Norm-Referenced Assessment: Compares a student's performance against other students (a national group or other "norm")

- Alternate Assessments

Interim/Benchmark Assessment

- Evaluates student performance at periodic intervals, frequently at the end of a grading period. Can predict student performance on end-of-the-year summative assessments.

Unit 3: Differentiation/Accommodations/Modifications

	Content Curriculum, standards	**Process** How students make sense or understand information being taught	**Product** Evidence of Learning
G&T	❖ Compacting ❖ Flexible grouping ❖ Independent study/set own learning goals ❖ Interest/station groups ❖ Varying levels of resources and materials ❖ Use of technology	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, multiple choice, open ended… ❖ Centers/Stations ❖ Use of technology ❖ Journals/Logs	❖ Choice boards ❖ Podcast/blog ❖ Debate ❖ Design and conduct experiments ❖ Formulate & defend theory ❖ Design a game ❖ Rubrics
ELL	❖ Compacting ❖ Flexible grouping ❖ Controlled choice ❖ Multi-sensory learning-auditory, visual, kinesthetic, tactile ❖ Pre-teach vocabulary ❖ Vocabulary lists ❖ Visuals/Modeling ❖ Varying levels of resources and materials ❖ Use of technology	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, choice, open ended… ❖ Centers/Stations ❖ Scaffolding ❖ Chunking ❖ E-Dictionaries, bilingual dictionaries ❖ Extended time ❖ Differentiated instructional outcomes ❖ Use of technology ❖ Frequent checks for understanding	❖ Rubrics ❖ Simple to complex ❖ Group tasks ❖ Quizzes, tests with various types of questions ❖ Generate charts or diagrams to show what was learned ❖ Act out or role play
At Risk	❖ Compacting ❖ Flexible grouping ❖ Controlled choice ❖ Multi-sensory learning-auditory, visual, kinesthetic, tactile ❖ Pre-teach vocabulary ❖ Vocabulary lists ❖ Visuals/Modeling Varying levels of resources and materials ❖ Use of technology	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, multiple choice, open ended… ❖ Centers/Stations ❖ Scaffolding ❖ Chunking ❖ Extended time ❖ Differentiated instructional outcomes ❖ Use of technology ❖ Partner work ❖ Frequent checks for understanding	❖ Rubrics ❖ Simple to complex ❖ Group tasks ❖ Quizzes, tests ❖ Oral Assessments ❖ Generate charts or diagrams to show what was learned ❖ Act out or role play
IEP/504	❖ Compacting ❖ Flexible grouping ❖ Controlled choice ❖ Multi-sensory learning-auditory, visual, kinesthetic, tactile ❖ Pre-teach vocabulary ❖ Visuals/Modeling Varying levels of resources and materials	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, multiple choice, open ended… ❖ Centers/Stations ❖ Scaffolding ❖ Extended time ❖ Differentiated instructional outcomes ❖ Preferential Seating	❖ Rubrics ❖ Simple to complex ❖ Group tasks ❖ Quizzes, tests ❖ Oral Assessments ❖ Generate charts or diagrams to show what was learned ❖ Act out or role play

	❖ Use of technology ❖ Provide word boxes ❖ Use of a calculator ❖ Present fewer multiple choice answers ❖ Acknowledge alternate responses such as pictures and/or verbal instead of written ❖ Teacher may scribe for student ❖ Oral assessment instead of written	❖ Use of technology ❖ Small group/one-to-one instruction ❖ Teach information processing strategies ❖ Chunking ❖ Frequent checks for understanding ❖ Access to teacher created notes ❖ Use of visual and multisensory formats ❖ Use of assistive technology ❖ Use of prompts ❖ Vocabulary walls and anchor charts available ❖ Provide a Study Guide ❖ Graphic organizers ❖ Teacher modeling or anchor charts on board ❖ Provide multi-level reading material ❖ Chunk learning into smaller segments ❖ Small group instruction	

Instructional Routines for Core Instructional Delivery

Collaborative Problem Solving Connect Previous Knowledge to New Learning Making Thinking Visible Develop and Demonstrate Mathematical Practices Inquiry-Oriented and Exploratory Approach Multiple Solution Paths and Strategies	Use of Multiple Representations Explain the Rationale of your Math Work Quick Writes Pair/Trio Sharing Turn and Talk Charting Gallery Walks Small Group and Whole Class Discussions Student Modeling	Analyze Student Work Identify Student's Mathematical Understanding Identify Student's Mathematical Misunderstandings Interviews Role Playing Diagrams, Charts, Tables, and Graphs Anticipate Likely and Possible Student Responses Collect Different Student Approaches	Multiple Response Strategies Asking Assessing and Advancing Questions Revoicing Marking Recapping Challenging Pressing for Accuracy and Reasoning Maintain the Cognitive Demand

Content Area: Geometry	Grade Level : Fourth
Unit 4: Geometry and Measurement	Time Frame: May - June

Interdisciplinary Connections

NGSS Connection:

Energy

- 4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.
    - **Cross cutting concepts to NJSLS math standard(s):** 4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the 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.

Waves and their Applications in Technologies for Information Transfer

- 4-PS4-1. Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.4 Model with mathematics.
    - **Cross cutting concepts to NJSLS math standard(s):** 4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
- 4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.4 Model with mathematics.
    - **Cross cutting concepts to NJSLS math standard(s):** 4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

From Molecules to Organisms: Structures and Processes

- 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
    - **Cross cutting concepts to NJSLS math standard(s):** 4.G.A.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded across the line into matching parts. Identify line symmetric figures and draw lines of symmetry.

Engineering Design

- 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
    - **Cross cutting concepts to NJSLS math standard(s):** 3-5.OA Operations and Algebraic Thinking.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.2 Reason abstractly and quantitatively.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.4 Model with mathematics.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.5 Use appropriate tools strategically.

- 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
    - **Cross cutting concepts to NJSLS math standard(s):** 3-5.OA Operations and Algebraic Thinking.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.2 Reason abstractly and quantitatively.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.4 Model with mathematics.
    - **Cross cutting concepts to NJSLS math standard(s):** MP.5 Use appropriate tools strategically.

ELA Connection:

Informational Text Key Ideas and Details

- RI.4.1. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- RI.4.2. Determine the main idea of a text and explain how it is supported by key details; summarize the text.

Integration of Knowledge and Ideas

- RI.4.7. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

Comprehension and Collaboration

- SL.4.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
    - A. Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.
    - B. Follow agreed-upon rules for discussions and carry out assigned roles.
    - C. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
    - D. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
- SL.4.2. Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g.,visually, quantitatively, and orally).

Production and Distribution of Writing

- W.4.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
- W.4.8. Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

Career Ready Practices

CRP4. Communicate clearly and effectively and with reason.
Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.

CRP6. Demonstrate creativity and innovation.
Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.

CRP11. Use technology to enhance productivity.
Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.

9.1 Personal Financial Literacy: By the end of grade 4, students should be able to…

STRAND A: INCOME AND CAREERS
9.1.4.A.1 Explain the difference between a career and a job, and identify various jobs in the community and the related earnings.
9.1.4.A.2 Identify potential sources of income.
9.1.4.A.3 Explain how income affects spending and take-home pay.

STRAND F: CIVIC FINANCIAL RESPONSIBILITY
9.1.4.F.1 Demonstrate an understanding of individual financial obligations and community financial obligations.

9.2 Career Awareness, Exploration, and Preparation: By the end of grade 4, students will be able to…

STRAND A: CAREER AWARENESS

- 9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.
- 9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.
- 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Technology Standards (8.1 and 8.2): grades 3-5

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 and to create and communicate knowledge.

D. Technology Operations and Concepts: *Students demonstrate a sound understanding of technology concepts, systems and operations.*

Understand and use technology systems:

8.1.5.A.1: Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

Select and use applications effectively and productively.

8.1.5.A.2: Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.

8.1.5.A.3: Use a graphic organizer to organize information about problem or issue.

8.1.5.A.4: Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.

8.1.5.A.5: Create and use a database to answer basic questions.

8.1.5.A.6: Export data from a database into a spreadsheet; analyze and produce a report that explains

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 and to create and communicate knowledge.

E: Research and Information Fluency: *Students apply digital tools to gather, evaluate, and use information.*

Plan strategies to guide inquiry

Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.

Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.

8.1.5.E.1: Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks.

Unit 4: Geometry and Measurement

Standards:

4.OA.A. Use the four operations with whole numbers to solve problems.

- 4.OA.A.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the 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. ***(benchmarked)**

4.NBT.B. Use place value understanding and properties of operations to perform multi-digit arithmetic.

- 4.NBT.B.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm. [Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.] ***(benchmarked)**

4.G.A. Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

- 4.G.A.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
- 4.G.A.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.
- 4.G.A.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.

4.MD.C. Geometric measurement: understand concepts of angle and measure angles.

- 4.MD.C.5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.
  - 4.MD.C.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.C.5b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.
  - 4.MD.C.6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
- 4.MD.C.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 measures 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 the unknown angle measure.

Essential Questions:	**Enduring Understanding:**
• How does drawing points, line segments, rays, angles, perpendicular, and parallel lines help you identify two-dimensional figures? • How does recognizing parallel sides help you to classify figures? • How does identifying angles help you to classify triangles? • How does line symmetry help you identify regular and irregular figures? • How does using a protractor enhance your understanding of angles and sketching of angles? • How does writing an equation help you solve for the unknown? • How can estimation strategies help you solve for reasonableness?	**Learning Goal 1:** Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines and identify these in two-dimensional figures. **Learning Goal 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 particular size; recognize right angles as a category, and identify right, acute, obtuse, equilateral, isosceles, and scalene triangles. **Learning Goal 3:** Draw lines of symmetry and identify line-symmetric figures. **Learning Goal 4:** Explain angles as geometric shapes formed by two rays sharing a common endpoint and explain the relationship between a one-degree angle, a circle, and angle measure. **Learning Goal 5:** Measure angles in whole number degrees using a protractor and sketch angles of specific measures. **Learning Goal 6:** Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems using a symbol for an unknown angle measure. **Learning Goal 7:** Write and solve each equation (including any of the four operations) in order to solve multi-step word problems, using a letter to represent the unknown; interpret remainders in context and assess the reasonableness of answers using mental computation with estimation strategies.
Knowledge and Skills: **Concept 1:** Trapezoid is a quadrilateral with at least one pair of parallel sides. **Concept 2:** Angles are formed by two rays sharing a common endpoint and result from the rotation of one ray around the endpoint.	**Demonstration of Learning:** ***Students are able to: (TLWBAT/SWBAT):*** **Objective 1:** draw points, lines, line segments and rays. Draw angles (right, acute, obtuse). Draw perpendicular and parallel lines. **Objective 2:** distinguish between lines, line segments, and rays. **Objective 3:** identify points, lines, line segment, rays, right angles, acute angles, obtuse angles, perpendicular lines and parallel lines in two-dimensional figures.

Concept 3: Angle Measurement: An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees. **Concept 4:** Angle measures may be added; when an angle is decomposed into non-overlapping parts, the angle measure of the whole (original angle) is the sum of the angle measures of the parts. **Concept 5:** Proper use of the equal sign. **Concept 6:** Improper use of the equal sign (e.g. 3 + 7 = 10 – 5 = 5 is incorrect).	**Objective 4:** classify triangles based on the presence or absence of perpendicular lines and based on the presence or absence of angles of a particular size. **Objective 5:** classify quadrilaterals based on the presence or absence of parallel or perpendicular lines and based on the presence or absence of angles of a particular size. **Objective 6:** fold a figure along a line in order to create matching parts. Explain why an answer is reasonable. **Objective 7:** identify lines of symmetry as a line across the figure such that the figure can be folded along the line into matching parts. **Objective 8:** identify figures having line symmetry and draw lines of symmetry. **Objective 9:** describe an angle as measured with reference to a circle with the center of the circle being the common endpoint of the rays. Explain why an answer is reasonable. **Objective 10:** explain a 'one-degree angle' and its relation to a circle; a "degree" is defined as 1/360 (one degree angle) of the entire circle. Explain why an answer is reasonable. **Objective 11:** measure angles in whole-number degrees and/or given an angle measure, sketch the angle. Explain why an answer is reasonable. **Objective 12:** solve multi-step word problems involving any of the four operations. Solve multi-step word problems involving interpretation (in context) of a remainder. Explain why an answer is reasonable. **Objective 13:** write equations to represent multi-step word problems, using a letter to represent the unknown quantity. Explain why an answer is reasonable. **Objective 14:** use mental computation and estimation strategies to determine whether an answer is reasonable. Explain why an answer is reasonable. **Objective 15:** add and subtract using the standard algorithm with accuracy and efficiency.

Core Instructional and Supplemental Materials:	**Technology Integration/ Resources:**	**Illustrative Mathematics:**
Carter, John A., Ph.D., Cuevas, Gilbert Ph.D., Day, Roger Ph.D., Malloy, Carol Ph.D.. *McGraw-Hill Education: My Math grades k-5*. McGraw-Hill Education, 2016. www.connectED.mcgraw-hill.com • "Model the Math" activities in Teacher Edition for each lesson • "Literature Connection" found in Teacher Edition for each lesson • "Real-World Problem Solving Reader" • RTI Differentiated Instruction / ELL Support for each chapter • Laptops • Math centers/stations • Video tutorials for anticipatory set/guided visuals • Anchor charts created by teachers • Reference sheets created by teachers • Vocabulary Activities/Math Word Wall • Problem of the day(s)/Weeks	• www.connectED.mcgraw-hill.com • Smart board • www.edhelper.com • www.ixl.com • www.multiplication.com • www.internet4classrooms.com • www.mathplayground.com • www.softschools.com • www.KhanAcademy.com • www.Superteacherworksheets.com • www.xtramath.org • www.sumdog.com • http://exchange.smarttech.com/ • www.teacherled.com • https://play.prodigygame.com/ • https://www.mrnussbaum.com/ • https://www.abcya.com/ • http://www.mathbuddyonline.com/ • https://www.aaamath.com/ • https://www.math-drills.com/	• 4.G.A.1 The Geometry of Letters • 4.G.A.1 What's the Point? • 4.G.A.2 Are these right? • 4.G.A.2 Defining Attributes of Rectangles and Parallelograms • 4.G.A.3 Finding Lines of Symmetry • 4.G.A.3 Lines of symmetry for triangles • 4.MD.C.6, 4.MD.C.7, 4.G.A.1 Measuring Angles • 4.MD.C.7, 4.G.A.2 Finding an unknown angle • 4.OA.A.3 Carnival Tickets

Suggested Activities:		
Geometry Town – Have students create a map of a town which includes certain geometric terms such as shapes, lines, and angles. Students will label map accordingly.	Introduce vocabulary words Use manipulative to explore shapes Have students go on a scavenger hunt and locate shapes within/outside the school.	Create foldable to practice with measuring and classifying angles.

Formative/Summative/Benchmark Assessments:

Diagnostic Assessment (as Pre-Assessment): Assesses a student's strengths, weaknesses, knowledge, and skills prior to instruction.

- STAR 360**,** iXL, Pre-assessments per grade level
- Summer packet review
- Daily Problem of the Day
- Diagnostic Pre-Chapter Assessment "Am I Ready" for each chapter

Formative Assessments: Assesses a student's performance during instruction, and usually occurs regularly throughout the instruction process.

- Writing Prompts, Journals, and Portfolios, Do-Now(s), Exit Tickets, iXL (performance assessments), Hands on Labs, Projects, Menu Choice boards, Anticipatory Sets, Problem of the Week

Summative Assessments: Measures a student's achievement at the end of instruction.

- Diagnostic Quizzes, Activities, Tasks, Challenge Problems, Unit Tests, Chapter Tests, End of Unit Writing Submissions, End of Unit Projects, Benchmark Assessments, midterms and finals (if applicable per grade level)
- Assessment Masters – Diagnostic Test for each unit Chapter Test – on level (2A)
- STAR 360 benchmark assessments

Criterion-Referenced Assessment: Measures a student's performance against a goal, specific objective, or standard.

Norm-Referenced Assessment: Compares a student's performance against other students (a national group or other "norm")

- Alternate Assessments

Interim/Benchmark Assessment

- Evaluates student performance at periodic intervals, frequently at the end of a grading period. Can predict student performance on end-of-the-year summative assessments.

Unit 4: Differentiation/Accommodations/Modifications

	Content Curriculum, standards	**Process** How students make sense or understand information being taught	**Product** Evidence of Learning
G&T	❖ Compacting ❖ Flexible grouping ❖ Independent study/set own learning goals ❖ Interest/station groups ❖ Varying levels of resources and materials ❖ Use of technology	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, multiple choice, open ended… ❖ Centers/Stations ❖ Use of technology ❖ Journals/Logs	❖ Choice boards ❖ Podcast/blog ❖ Debate ❖ Design and conduct experiments ❖ Formulate & defend theory ❖ Design a game ❖ Rubrics
ELL	❖ Compacting ❖ Flexible grouping ❖ Controlled choice ❖ Multi-sensory learning-auditory, visual, kinesthetic, tactile ❖ Pre-teach vocabulary ❖ Vocabulary lists ❖ Visuals/Modeling ❖ Varying levels of resources and materials ❖ Use of technology	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, choice, open ended… ❖ Centers/Stations ❖ Scaffolding ❖ Chunking ❖ E-Dictionaries, bilingual dictionaries ❖ Extended time ❖ Differentiated instructional outcomes ❖ Use of technology ❖ Frequent checks for understanding	❖ Rubrics ❖ Simple to complex ❖ Group tasks ❖ Quizzes, tests with various types of questions ❖ Generate charts or diagrams to show what was learned ❖ Act out or role play
At Risk	❖ Compacting ❖ Flexible grouping ❖ Controlled choice ❖ Multi-sensory learning-auditory, visual, kinesthetic, tactile ❖ Pre-teach vocabulary ❖ Vocabulary lists ❖ Visuals/Modeling Varying levels of resources and materials ❖ Use of technology	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, multiple choice, open ended… ❖ Centers/Stations ❖ Scaffolding ❖ Chunking ❖ Extended time ❖ Differentiated instructional outcomes ❖ Use of technology ❖ Partner work ❖ Frequent checks for understanding	❖ Rubrics ❖ Simple to complex ❖ Group tasks ❖ Quizzes, tests ❖ Oral Assessments ❖ Generate charts or diagrams to show what was learned ❖ Act out or role play
IEP/504	❖ Compacting ❖ Flexible grouping ❖ Controlled choice ❖ Multi-sensory learning-auditory, visual, kinesthetic, tactile ❖ Pre-teach vocabulary ❖ Visuals/Modeling Varying levels of resources and materials ❖ Use of technology	❖ Tiered Assignments ❖ Leveled questions- written responses, think-pair-share, multiple choice, open ended… ❖ Centers/Stations ❖ Scaffolding ❖ Extended time ❖ Differentiated instructional outcomes ❖ Preferential Seating ❖ Use of technology	❖ Rubrics ❖ Simple to complex ❖ Group tasks ❖ Quizzes, tests ❖ Oral Assessments ❖ Generate charts or diagrams to show what was learned ❖ Act out or role play

	❖ Provide word boxes ❖ Use of a calculator ❖ Present fewer multiple choice answers ❖ Acknowledge alternate responses such as pictures and/or verbal instead of written ❖ Teacher may scribe for student ❖ Oral assessment instead of written	❖ Small group/one-to-one instruction ❖ Teach information processing strategies ❖ Chunking ❖ Frequent checks for understanding ❖ Access to teacher created notes ❖ Use of visual and multisensory formats ❖ Use of assistive technology ❖ Use of prompts ❖ Vocabulary walls and anchor charts available ❖ Provide a Study Guide ❖ Graphic organizers ❖ Teacher modeling or anchor charts on board ❖ Provide multi-level reading material ❖ Chunk learning into smaller segments ❖ Small group instruction	

Instructional Routines for Core Instructional Delivery

Collaborative Problem Solving Connect Previous Knowledge to New Learning Making Thinking Visible Develop and Demonstrate Mathematical Practices Inquiry-Oriented and Exploratory Approach Multiple Solution Paths and Strategies	Use of Multiple Representations Explain the Rationale of your Math Work Quick Writes Pair/Trio Sharing Turn and Talk Charting Gallery Walks Small Group and Whole Class Discussions Student Modeling	Analyze Student Work Identify Student's Mathematical Understanding Identify Student's Mathematical Misunderstandings Interviews Role Playing Diagrams, Charts, Tables, and Graphs Anticipate Likely and Possible Student Responses Collect Different Student Approaches	Multiple Response Strategies Asking Assessing and Advancing Questions Revoicing Marking Recapping Challenging Pressing for Accuracy and Reasoning Maintain the Cognitive Demand