Summer Edition

K-8 Common Core Mathematics Curriculum Guide 2013

Archdiocese of San Francisco Department of Catholic Schools

Introduction

Dr. Nina K. Russo, Assistant Superintendent Curriculum and School Improvement

A committee convened in the spring of 2012 to write the new Mathematic Curriculum Guidelines, which is grounded in the Common Core to ensure alignment to the norm referenced testing in the Archdiocese, articulation with the high schools, and an emphasis on 21st century learning. The Guide includes unpacking CC Standards by grade level, K-8 math skill progressions, unit map templates by grade level using the Archdiocesan format of UBD, online resources, and other materials to support the teaching of the common core. Much of this was developed in coordination with Torrey Volk of ReThinkMathematics.com whose help, support, and good teaching were invaluable resources in this three year process. Torrey's webinars, which launch our Professional Development Series are available on the login pages of the Archdiocesan website.

The Archdiocese of San Francisco, Department of Catholic Schools would like to acknowledge and thank the educators who contributed to the Common Core Mathematics Guideline:

EDUCATOR	SCHOOL	GRADE
Leticia Abeyta	St. Charles Borromeo	4
Susan Alioto	St. Anne	2
Mary Boland	St. Gabriel School	6
Michael Bolden	St. Brendan	6-8
Charlene Calaunan	St. Dunstan	7-8
Patrick Calma	Holy Angels	3-8
Carol Cogliandro	St. James	8
Lynne Dowdy	St. Brendan	6-8
Carol Grewal	St. Brendan	Principal
Andreina Gualco	Good Shepherd	Principal
Angela Hadsell	St. Patrick	3-8
Sue Harless	St. Brigid	6-8
Sandra Jimenez	St. Peter	5
Brenda Joe	Good Shepherd	6-8
Christine Knopf	St. Anselm	K
Colleen Langridge	St. Pius	2-3
Anna McDonald	Nativity	Resource
Breanne Melconian	Immaculate Heart of Mary	6
Adrianne Murphy	St. James	6
Ruth Nelson	St. Brendan	Learning Specialist
Corinne Ortega	Our Lady of Perpetual Help	8
Claire Potter	St. Hilary	5-8
Anna Rivieccio	Holy Name	6
Joe Ryan	St. Mary	7-8
Veda Ryan	St. Pius	4-8
Mavis Wall	St. Isabella	3
Jennifer Woodall	St. Paul	6

Table of Contents

- These documents show the vertical progression of the content standards broken into primary, intermediate, and middle school levels. Many teachers use this document to help differentiate their instruction as it shows the standard in the previous grade, grade level, and next grade level.

Individual Grade Level Common Core Resources
- Grades K-8 have the following supporting documents:
    - One Page Overview
    - Year-at-a-glance
    - Quarterly Math Units
        - Unit Templates

- One Page Overview
- Quarterly Planning Map

- Common Core State Standards in Mathematics Glossary
- Common Core State Standards in Mathematics Table 1
- Common Core State Standards in Mathematics Table 2
- Common Core State Standards in Mathematics Table 3
- Common Core State Standards in Mathematics Table 4
- Common Core State Standards in Mathematics Table 5

Philosophy

We advocate teaching a balanced math program which emphasizes student proficiency in problem solving, conceptual understanding, and procedural fluency.

We commit to the Common Core, based on national standards, and an instructional program that builds in scope and content across the grade levels, K-8.

We value and promote the connection between mathematics and other disciplines. We believe in order to enhance students' understanding and their ability to contribute to the global community, mathematics must be relevant to daily life.

We recognize the essential need for inclusion and empowerment of all students in the mathematics program.

We believe in teaching the Math CCSS using multiple modalities and instructional strategies to address and meet the diverse needs of all students.

Frequently Asked Questions

1. **Are any textbook series currently aligned to the Common Core Standards?**
    No textbooks are fully aligned to the new Common Core math standards. Some textbooks are partially aligned to the standards like Scott Foresman's *Envision* and Think Central's *Math in Focus*. No textbook series has been adopted by the state of California. There are many supplemental resources that can be used to supplement existing curriculum. The math committee and coaches will address this question in our spring PD #3, but this is an issue that will continue into 2013-2014 as new resources emerge.

2. **When will the Report Cards be aligned to the Common Core Standards?**
    In the 2013-2014 school year.

3. **Do we have to follow the pacing included in the curriculum guide?**
    No, the Pacing Guide is a resource that is to be used as a guide for the new standards and teacher planning. Teachers may find a need to alter the order of standards taught, but the changes should be made judiciously, as the pacing guide is a good demonstration of one math skill building on another.

4. **What is the difference between "Mastery" and "Fluency?"**
    All standards should be "mastered". An informal definition of *mastery* is that a student can correctly answer 3 example problems that represent that grade level standard.

    Some standards require students to "*fluently*" master the standards. *Fluency* is when a student correctly answers problems in a given time constraint without the use of models, and/or manipulatives.

5. **How are the Common Core Standards aligned to the IOWA Testing?**
    The new IOWA Assessments have Common Core Math items embedded in the math tests. These test items were selected from a bank that "match" common core skills. However, it is hoped that future tests items will be built from the ground level using common core standards of practice, content, and mathematical thinking, which demonstrate a more robust complexity of the common core standards The Data Manager report functions of the IOWA has the ability to disaggregate achievement scores, and the ability to isolate Common Core Math Scores, as presented in the IOWA assessment.

6. **How are the teachers going to be supported in Implementation of the Common Core Standards?**
    The *Common Core Math Guide* is a major source of support. The Guide includes the grade level standards, an aligned pacing guide for each grade level organized by quarters, resources on how to teach major math concepts, such as fractions, and first draft, partially completed unit maps, by grade level. In addition, there three Minimum Professional Development days and the K-8 Day for the 2012-2013 school year are all devoted to teaching the Common Core Math.

Frequently Asked Questions Continued

7. **Are the Catholic High Schools using Common Core Standards?**
   Archdiocesan high schools are at different places in adopting the Common Core standards in both Math and ELA (English Language Arts), but all high schools will use the Common Core in curriculum development as its standards will be reflected in ACT, PLAN, SAT, and PSAT test items.

8. **What does a well-balanced Math program include?**
   A well-balanced math program provides three different mathematical teaching and understanding: Conceptual Understanding, Procedural Proficiency, and Applications of Mathematical Processes and Practices. Conceptual understanding requires teachers and students to model and communicate their understanding of a given math concept. Procedural proficiency asks students to f*luently* solve math problems correctly using the standards algorithm. Applications in the mathematical processes and practices require students to problem solve and apply the math concepts in the real world.

9. **What is the difference between the 8th grade Math curriculum and the Algebra I curriculum?**
   There are not many differences between the two curricula. Algebra I includes all concepts of 8th grade math with the addition of the following algebraic concepts: Operations on Polynomials; Quadratic Equations, Rational Functions, and Polynomials of degree ≥ 2. Students entering 8th grade with a strong foundation of 6th and 7th grade skills should go into Algebra 1.

10. **What happens to a student who comes into a grade level not mastering the previous grade's standard?**
    All of our work in mapping is built around the concept of differentiation. Teachers will need to differentiate their instruction and assessment to meet the achievement level of students either below standards or above.

The *Archdiocesan Common Core Mathematic Curriculum Guide* includes a variety of documents to assist teachers write their classroom curriculum (map) for the Common Core. The Guide provides standards in <u>various formats</u> by grade level, standards for mathematical practice across the Common Core, grade level pacing guides, vertical alignment concepts, a resource section, and partially completed unit maps. The various chapters work in concert to give an in depth understanding of the math curriculum and offer preparation materials for both mapping and instructional delivery of the Common Core.

K – 8 Common Core Domains

K – 2nd Grade
(K only) Counting and Cardinal Numbers
Numbers and Operations in Base Ten
Operations and Algebraic Thinking
Measurement and Data
Geometry

3rd – 5th Grade
Numbers and Operations in Base Ten
Number and Operations – Fractions
Operations and Algebraic Thinking
Measurement and Data
Geometry

6th – 7th Grade
Ratios and Proportional Relationships
The Number System
Expressions and Equations
Geometry
Statistics and Probability

8th Grade
The Number System
Expressions and Equations
Functions
Statistics and Probability
Geometry

Algebra I
Functions
Number and Quantity
Algebra
Modeling
Geometry

There are 4 standards that are different in Algebra I and are not in the 8th grade Common Core Standards: **Perform arithmetic operations on polynomials**, **quadratic equations and quadratic formula, rational functions, and polynomials of degree $\geq$ 2.**

K – 8 Critical Areas of Common Core Mathematics

Mathematics | Kindergarten 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.

Mathematics | Grade 1 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.

Mathematics | Grade 2 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.

Mathematics | Grade 3 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.

Mathematics | Grade 4 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.

Mathematics | Grade 5 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.

K – 8 Critical Areas of Common Core Mathematics

Mathematics | Grade 6 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.

Mathematics | Grade 7 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.

Mathematics | Grade 8 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.

K – 8 Progression of Common Core Standards

Primary Progression: Counting Numbers
Kindergarten
• K.CC.1: Count to 100 by ones and by tens.
• K.CC.2: Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
First Grade
• 1.NBT.1: Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
Second Grade
• 2.NBT.2: Count within 1,000; skip-count by 5s, 10s, and 100s.

Primary Progression: Comparing Numbers
Kindergarten
• K.CC.7: Compare two numbers between 1 and 10 presented as written numerals.
First Grade
• 1.NBT.3: Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.
Second Grade
• 2.NBT.4: Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.

Primary Progression: Place Value
Kindergarten
• K.NBT.1: Place Value 11-19
First Grade
• 1.NBT.2: Understand that the two digits of a two-digit number represent amounts of tens and ones.
Second Grade
• 2.NBT.1: Place Value (hundreds, tens and ones)
• 2.NBT.3: Read and write numbers to 1,000 (base ten numerals, number names, expanded form).

K – 8 Progression of Common Core Standards

Primary Progression: Addition and Subtraction
Kindergarten • K.OA.2: Add and subtract within 10, e.g., by using objects or drawings. • K.OA.5: *Fluently* add and subtract within 5.
First Grade • 1.OA.6: Add and subtract within 20. • 1.OA.6: *Fluently* add and subtract within 10. • 1.NBT.4: Add within 100 (2 digit by 1 digit; 2 digit by multiple of 10).
Second Grade • 2.NBT.5: *Fluently* add and subtract within 100. • 2.NBT.6: Add up to 4 two-digit numbers. • 2.NBT.7: Add and subtract within 1,000. • 2.OA.2: *Fluently* add and subtract within 20.

Primary Progression: Shapes and Fractions
Kindergarten • K.G.3: Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).
First Grade • 1.G.2: Compose shapes into new shapes. • 1.G.3: Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves, fourths, and quarters.*
Second Grade • 2.G.1: Recognize and draw shapes based on specific attributes given. • 2.G.3: Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words *halves, thirds, half of, a third of, etc.*

K – 8 Progression of Common Core Standards

Primary Progression: Money, Time, and Measurement

Kindergarten
- Demonstrate concept of time (morning, afternoon, night) and tools that measure time (calendar and days of week). *CA Addition

- K.MD.2: Compare two objects (taller/shorter etc.).

- *Identify and name coins: penny, nickel, dime and quarter. *SF Arch Addition

First Grade
- 1.MD.3: Tell and write time to the nearest hour and half hour (using am and pm).

- 1.MD.1: Measure lengths indirectly; Understand concept of whole number length units.

- *Identify the name and value of all coins to a dollar *SF Arch Addition

Second Grade
- 2.MD.7: Tell and write time to the nearest 5 minutes (using am and pm).

- 2.MD.1-4: Measure and estimate lengths in standard units (inches, feet, centimeters, meters).

- 2.MD.8: Solve word problems involving combinations of money. Use the $ and c signs correctly (**do not use decimals).**

Intermediate Progression: Place Value

Third Grade
- Read, write, and compare numbers to 100,000.

- 3.NBT.1: Use place value understanding to **round** whole numbers to the nearest 10 or 100.

Fourth Grade
- 4.NBT.2: Read, write, and compare numbers to 1,000,000.
  - *Example: How is the 2 in the number 582 similar to and different from the 2 in the number 528?*

- 4.NBT.3: Use place value understanding to **round** multi-digit whole numbers to any place.

- 4.NF.7: Compare two **decimals** to hundredths .

Fifth Grade
- 5.NBT.1: Read, write, and compare all whole numbers.

- 5.NBT.4: Round all whole numbers.

- 5.NBT.3: Read, write, and compare decimals to thousandths.

K – 8 Progression of Common Core Standards

Intermediate Progression: Operations
Third Grade
• 3.NBT.2: Fluently add and subtract within 1,000.
• 3.OA.7: Fluently multiply and divide within 100.
• 3.NBT.3: Multiply one-digit whole numbers by multiples of 10 in the range 10–90.
Fourth Grade
• 4.NBT.4: Fluently add and subtract multi-digit whole numbers using the standard algorithm.
• 4.NBT.5: Multiply a whole number of up to 4 x1 digit and 2 x 2 digit numbers.
• 4.NBT.6: Find whole-number quotients and remainders (up to four-digit dividends and one-digit divisors).
Fifth Grade
• 5.NBT.5: Fluently multiply multi-digit whole numbers using the standard algorithm.
• 5.NBT.6: Find whole-number quotients of whole numbers up to four-digit dividends and two-digit divisors.
• 5.NBT.7: Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings.

Intermediate Progression: Fractions
Third Grade (*limited to fractions with denominators 2, 3, 4, 6, and 8*)
• 3.NF.2: Understand a fraction as a number on the number line.
• 3.NF.3: Recognize and generate simple equivalent fractions.
• 3.NF.3: Compare two fractions with the same numerator or the same denominator.
Fourth Grade (*limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, & 100*)
• 4.NF.1: Recognize and generate equivalent fractions.
• 4.NF.2: Compare two fractions with different numerators and different denominators.
• 4.NF.3: Add and subtract fractions (including mixed numbers) with like denominators.
• 4.NF.4: Multiply a fraction by a whole number.
Fifth Grade
• 5.NF.1: Add and subtract fractions (including mixed numbers) with unlike denominators.

• 5.NF.4: Multiply a fraction by a fraction.

K – 8 Progression of Common Core Standards

Intermediate Progression: Geometry/Measurement
Third Grade
• 3.G.1: Understand that shapes in different categories (e.g., rhombi, rectangles…) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals).
• 3.G.2: Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.
• 3.MD.5: Recognize and understand concept of area.
• 3.MD.6: Measure area by counting unit squares.
• 3.MD.8: Solve real world and mathematical problems involving perimeters of polygons.
• 3.MD.1: Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes.
• 3.MD.2: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Solve word problems involving measurement using the four operations.
Fourth Grade
• 4.G.1-3: Draw and identify lines, angles; classify shapes by properties of their lines and angles (symmetry).
• 4.MD.5-7: Geometric measurement: understand concepts of angle and measure angles.
• 4.MD.1-3: Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit *(time, measurement units, perimeter, area etc.).*
Fifth Grade
• 5.MD.1: Convert like measurement units within a given measurement.
• 5.MD.3-5: Concept of volume, measurement of volume, apply formulas for volume, recognize volume as additive.
• 5.G.1-2: Graph points on the coordinate plane to solve real-world and mathematical problems.
• 5.G.3-4: Classify two-dimensional figures into categories based on their properties.
• *Know sum of the angles of any triangle is 180 and the sum of the angles of any quadrilateral is 360. *CA Addition

- *Derive and use the formula for the area of a triangle and parallelogram by comparing it with the formula for the area of a rectangle. *CA Addition

K – 8 Progression of Common Core Standards

K-5 Progression: Line Plots
Second Grade
• 2.MD.9: Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
Third Grade
• 3.MD.4: Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.
Fourth Grade
• 4.MD.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.
Fifth Grade
• 5.MD.2: Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.

K-5 Progression: Algebra
Kindergarten
• K.OA.4: Compose numbers to 10 (5+? = 10; 4+? = 10).
First and Second Grade
• 1.OA.8 and 2.OA.1: Determine the unknown whole number in an addition or subtraction equations relating three whole numbers: $8 + ? = 11, 5 = ? - 3, 6 + 6 = ?$
Third Grade
• 3.OA.4: Determine the unknown number in a multiplication or division equations.
Fourth Grade
• 4.OA.5: Generate and analyze patterns.
Fifth Grade
• 5.OA.1: Order of Operations: evaluate expressions using parenthesis, brackets and braces.
• 5.OA.2: Write expressions from words.
• 5.OA.3: Analyze algebraic patterns and relationships (i.e. what is my rule?).

K – 8 Progression of Common Core Standards

Middle Grades Progression: The Number System
Sixth Grade
6.NS.1: Divide fractions by fractions.   6.NS.2: *Fluently* divide multi-digit numbers using the standard algorithm.   6.NS.3: *Fluently* add, subtract, multiply, divide multi-digit decimals using the standard algorithm.   6.NS.6: Understand a rational number as a point on the number line.   6.NS.7: Understand ordering and absolute value of rational numbers.   *Add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. (CC: 7NS-1) *CA
Seventh Grade
7.NS.1: Add and subtract rational numbers.   - Example: Use a number line to subtract: -6 – (-4) *modeling   7.NS.2: Multiply and divide rational numbers.   *Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion, which repeats eventually into a rational number. (CC 8NS-1) *CA   *Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). (CC 8NS-2) *CA
Eighth Grade * same standards as 7th Grade

Middle Grades Progression: Rates and Proportions
Sixth Grade
6.RP.1: Concept of Ratio   6.RP.2: Concept of Unit Rate   6.RP.3: Use ratio and rate reasoning to solve real-world mathematical problems including %.
Seventh Grade
7.RP.1: Compute Unit Rates   7.RP.2: Recognize and represent proportional relationships between quantities.   7.RP.3: Use proportional relationships to solve multistep ratio and percent problems.

K – 8 Progression of Common Core Standards

Middle Grades Progression: Algebra

Sixth Grade
- 6.EE.1: Write and evaluate numerical expressions involving whole-number exponents.
  - Example 3: Suzanne says the two expressions $2(3a - 2) + 4a$ and $10a - 2$ are equivalent? Is she correct? Explain why or why not?

- 6.EE.2: Write, read, and evaluate expressions in which letters stand for numbers.

- 6.EE.3: Apply the properties of operations to generate equivalent expressions.

- 6.EE.4: Identify when two expressions are equivalent.

- 6.EE.5-8: Reason about and solve one-variable equations and inequalities.

Seventh Grade
- 7.EE.1: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

- 7.EE.2: Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
  - For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."

- 7.EE.4: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems.

- Use square root and cube root symbols to represent solutions to equations of the form $X^2 = p$ and $X^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational. (CC 8EE-2) *CA

- Distributive property (i.e. express $36 + 8$ as $4(9 + 2)$)

Eighth Grade
- 8.EE.1-4: Work with radicals and integer exponents.

- 8.EE.5-6: Understand the connections between proportional relationships, lines, and linear equations.

- 8.EE.7: Solve linear equations in one variable.

- 8.EE.8: Analyze and solve pairs of simultaneous linear equations.

- 8.F.1-3: Define, evaluate, and compare functions.

- 8.F.4-5: Use functions to model relationships between quantities.

K – 8 Progression of Common Core Standards

Middle Grades Progression: Geometry

Sixth Grade
- 6.G.1-4: Solve real-world and mathematical problems involving area, surface area, and volume.

- *Draw, construct, and describe geometrical figures and describe the relationships between them (CC7.G). *CA

- *Know the formulas for the area and circumference of a circle (CC7.G). *CA

Seventh Grade
- 7.G.4-6: Draw, construct, and describe geometrical figures and describe the relationships between them.

- *Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve problems (CC 8G-9). *CA

Eighth Grade
- Students use understandings of angles (supplementary, complementary, vertical, and adjacent angles) and deductive reasoning to write and solve equations.

- 8.G.1-5: Understand congruence and similarity using physical models, transparencies, or geometry software.

- 8.G.6-8: Understand and apply the Pythagorean Theorem.

- 8.G.9: Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.

Middle Grades Progression: Statistics and Probability

Sixth Grade
- 6.SP.1-3: Develop understanding of statistical variability.

- 6.SP.4-5: Summarize and describe distributions.

Seventh Grade
- 7.SP.1-2: Use random sampling to draw inferences about a population.

- 7.SP.3-4: Draw informal comparative inferences about two populations.

- 7.SP.5-8: Investigate chance processes and develop, use, and evaluate probability models.

Eighth Grade
- 8.SP.1-4: Investigate patterns of association in bivariate data.

Standards for Mathematical Practice

The Standards for Mathematical Practice ascribe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education.

1. Make sense of problems and persevere in solving them. Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider multiple strategies and tools to analyze and solve the problem - using concrete objects or pictures to help conceptualize and solve if needed. They monitor and evaluate their progress and change course if necessary. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?"

2. Reason abstractly and quantitatively. Mathematically proficient students use mathematics in the abstract and are able to symbolically represent quantities and their relationships—understanding the underlying meaning, not just how to compute.

3. Construct viable arguments and critique the reasoning of others. Individually or in groups, mathematically proficient students articulate and defend their ideas and analyze the reasoning of others students.

4. Model with mathematics. Mathematically proficient students apply the mathematics they know to solve problems using tools such as diagrams, tables, graphs, and formulas to represent and analyze relationships and draw conclusions. Students can apply the mathematics they know to solve problems arising in everyday life, society, and the work- place. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community.

5. Use appropriate tools strategically. Mathematically proficient students select and use tools, including concrete models and technology, strategically to solve mathematical problems. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful.

6. Attend to precision. Mathematically proficient students are precise in their mathematical communication, use of terminology, and are careful about expressing numerical answers with a degree of precision appropriate for the problem context -units of measure, labels and symbols etc. They calculate *accurately and efficiently.*

7. Look for and make use of structure. Mathematically proficient students look for and make use of pattern and structure in learning mathematics and solving problems.

8. Look for and express regularity in repeated reasoning. Mathematically proficient students notice repetitions in calculations and look for general methods and for shortcuts.

Table of Standards for Mathematical Practice in Action

Practice	Sample Student Evidence	Sample Teacher Actions
1. Make sense of problems and persevere in solving them	□ Display sense-making behaviors □ Show patience and listen to others □ Turn and talk for first steps and/or generate solution plan □ Analyze information in problems □ Use and recall multiple strategies □ Self-evaluate and redirect □ Assess reasonableness of process and answer	□ Provide open-ended problems □ Ask probing questions □ Probe student responses □ Promote and value discourse □ Promote collaboration □ Model and accept multiple approaches
2. Reason abstractly and quantitatively	□ Represent abstract and contextual situations symbolically □ Interpret problems logically in context □ Estimate for reasonableness □ Make connections including real life situations □ Create and use multiple representations □ Visualize problems □ Put symbolic problems into context	□ Model context to symbol and symbol to context □ Create problems such as "what word problem will this equation solve?" □ Give real world situations □ Offer authentic performance tasks □ Place less emphasis on the answer □ Value invented strategies □ Think Aloud
3. Construct viable arguments and critique the reasoning of others	□ Questions others □ Use examples and non-examples □ Support beliefs and challenges with mathematical evidence □ Forms logical arguments with conjectures and counterexamples □ Use multiple representations for evidence □ Listen and respond to others well □ Uses precise mathematical vocabulary	□ Create a safe and collaborative environment □ Model respectful discourse behaviors □ "Find the error" problems □ Promote student to student discourse (do not mediate discussion) □ Plan effective questions or Socratic formats □ Provide time and value discourse

Table of Standards for Mathematical Practice in Action

4. Model with mathematics	□ Connect math (numbers and symbols) to real-life situations □ Symbolize real-world problems with math □ Make sense of mathematics □ Apply prior knowledge to solve problems □ Choose and apply representations, manipulatives and other models to solve problems □ Use strategies to make problems simpler □ Use estimation and logic to check reasonableness of an answer	□ Model reasoning skills □ Provide meaningful, real world, authentic performance-based tasks □ Make appropriate tools available □ Model various modeling techniques □ Accept and value multiple approaches and representations
5. Use appropriate tools strategically	□ Choose appropriate tool(s) for a given problem □ Use technology to deepen understanding □ Identify and locate resources □ Defend mathematically choice of tool	□ Provide a "toolbox" at all times with all available tools – students then choose as needed □ Model tool use, especially technology for understanding
6. Attend to precision	□ Communicate (oral and written) with precise vocabulary □ Carefully formulate questions and explanations (not retelling steps) □ Decode and interpret meaning of symbols □ Pay attention to units, labeling, scale, etc. □ Calculate accurately and effectively □ Express answers within context when appropriate	□ Model problem solving strategies □ Give explicit and precise instruction □ Ask probing questions □ Use ELA strategies of decoding, comprehending, and text-to-self connections for interpretation of symbolic and contextual math problems □ Guided inquiry

Table of Standards for Mathematical Practice in Action

7. Look for and make use of structure	☐ Look for, identify, and interpret patterns and structures ☐ Make connections to skills and strategies previously learned to solve new problems and tasks ☐ Breakdown complex problems into simpler and more manageable chunks ☐ Use multiple representations for quantities ☐ View complicated quantities as both a single object or a composition of objects	☐ Let students explore and explain patterns ☐ Use open-ended questioning ☐ Prompt students to make connections and choose problems that foster connections ☐ Ask for multiple interpretations of quantities
8. Look for and express regularity in repeated reasoning	☐ Design and state "shortcuts" ☐ Generate "rules" from repeated reasoning or practice (e.g. integer operations) ☐ Evaluate the reasonableness of intermediate steps ☐ Make generalizations	☐ Provide tasks that allow students to generalize ☐ Don't teach steps or rules, but allow students to explore and generalize in order to discover and formalize ☐ Ask deliberate questions ☐ Create strategic and purposeful check-in points

N. Smith, 2012

Adapted from:
NCSM Summer Leadership Academy, Atlanta, GA, June 22, 2011
iPad Ap "Common Core Look Fors (CCL4s)"

Grade Level Common Core Resources: Pre-Kindergarten

Grade Level Common Core Resources: Kindergarten

Standards Overview

K.CC: Counting and Cardinality
1. Rote count numbers to 100 by ones and tens
2. Rote count numbers to 100 starting at any number
3. Write and identify numbers 0 - 20 correctly
4. Count objects to 20 (one to one correspondence)
5. Count objects to 20 (How many objects total?)
6. Compare number of objects (up to 10 objects)
7. Compare numbers 1-10

K.OA: Operations and Algebraic Thinking
1. Represent addition and subtraction
2. Solve addition and subtraction to 10
3. Decompose numbers to 10 (5=3+2) (5=4+1)
4. Compose numbers to 10 (5+? = 10; 4+? = 10)
5. Fluently add and subtract to 5

K.NBT: Number and Operations in Base Ten
Place Value to 19

K.MD: Measurement and Data
1. Describe several measurable attributes of a single object (length, weight etc).
2. Compare two objects (taller/shorter etc).
3. Classify, sort, count objects.
4. *Demonstrate concept of time (morning, afternoon, night) and tools that measure time (calendar (days of week) and clock (time to the hour of events))**.**
5. *Identify and name coins: penny, nickel, dime and quarter.

*CA Addition

K.G: Geometry (2D: squares, circles, triangles, rectangles, hexagons; 3D: cubes, cones, cylinders, spheres)
1. Describe objects in the environment using names of shapes and position words such as above, below, beside, in front of, behind, and next to
2. Correctly name shapes
3. Identify shapes as 2D (lying in a plane, "flat") or 3D ("solid").
4. Analyze and compare 2 and 3D shapes using such words as vertices, corners, sides etc.
5. Model, build and draw shapes
6. Compose larger shapes from simple shapes (two triangles to form a rectangle etc.)

Unpacking the Common Core State Standards: Kindergarten
This link from the Public Schools of North Carolina State Board of Education will help teachers understand the standards and demonstrate the level of knowledge and skills students are expected to master. Please note that California additions to the CCSS are listed in the Standards Overview at each grade level.

Year-at-a-Glance: Kindergarten

September: UNIT 1		
Teach	• Count to 20 starting at any number • Write numbers 0-5	• Count objects to 5 • Identify 2D and 3D shapes
Assess		
Re-Teach	Grade K Grade Level and Unit 1 Standards as data shows	

October: UNIT 2		
Teach	• Count to 50 by ones and tens • Write numbers 0-10	• Count objects to 10 • Compare numbers 0-10
Assess	Grade K Grade Level and Unit 1 Standards Checkpoints	
Re-Teach	Grade K Grade Level and Unit 1 Standards as data shows	

November: UNIT 3		
Teach	• Count to 70 by ones and tens • Write numbers 0-15	• Count objects to 15 • + and – within 5
Assess	Grade K Grade Level and Units 1-2 Standards Checkpoints	
Re-Teach	Grade K Grade Level and Units 1-2 Standards as data shows	

December-January: UNIT 4		
Teach	• Count to 100 by ones and tens • Write numbers and count 0-20	• Word problems with + and – to 5 • Practice (de)composing to 10
Assess	Grade K Grade Level and Units 1-3 Standards Checkpoints	
Re-Teach	Grade K Grade Level and Units 1-3 Standards as data shows	

February-March: UNIT 5		
Teach	• Rote count to 100 by ones and tens from any number • Write numbers 0-20	• Addition and subtraction within 10 • Fluently add and subtract within 5 • Count objects to 20
Assess	Grade K Grade Level and Units 1-4 Standards Checkpoints	
Re-Teach	Grade K Grade Level and Units 1-4 Standards as data shows	

April-May: UNIT 6		
Teach	• Place value to 19 (tens and ones) • Compare 2 objects related to measureable attributes	• Ordinal numbers • Draw shapes
Assess	Grade K Grade Level and Units 1-5 Standards Checkpoints	
Re-Teach	Grade K Grade Level and Units 1-5 Standards as data shows	

June		
Assess	Grade K Grade Level and Units 1-6 Standards Checkpoints	
Re-Teach	Grade K Grade Level and Units 1-6 Standards as data shows	

First Quarter: Kindergarten

September: UNIT 1

UNIT 1 OVERVIEW
Students know number names up to 5 and the count sequence up to 20. They count up to 5 objects to tell "how many?" Students can identify and name the following shapes: squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres.

KEY CONCEPTS	KEY TERMS	
• Rote count to 20 starting at any number • Write numbers 0-5 • Count objects to 5 • Identify 2D and 3D shapes	• Count • Numeral • One • Ten • Group • Shape • Triangle	• Hexagon • Rectangle • Cylinder • Cone • Cube • Sphere • Solid

UNIT STANDARDS
K.CC.1: Count to 100 by ones and by tens. *May want to intersect Practice Standards 7 and 8 with this standard.

K.CC.2: Count forward beginning from a given number within the known sequence (instead of having to begin at 1). *May want to intersect Practice Standards 7 and 8 with this standard.

K.CC.3: Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects). *May want to intersect Practice Standard 6 with this standard.

K.CC.4: Understand the relationship between numbers and quantities; connect counting to cardinality. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. Understand that each successive number name refers to a quantity that is one larger. Develop understanding of ordinal numbers (first through tenth) to describe the relative position and magnitude of whole numbers. *May want to intersect Practice Standard 2 with this standard.

K.CC.5: Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects. *May want to intersect Practice Standard 7 with this standard.

K.G.2: Correctly name shapes regardless of their orientations or overall size. *May want to intersect Practice Standard 6 with this standard.

K.G.3: Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid"). *May want to intersect Practice Standard 3 with this standard.

Unit 1 Map: Kindergarten

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

First Quarter: Kindergarten

October: UNIT 2

UNIT 2 OVERVIEW
Students know number names up to 10 and the count sequence up to 50. They count up to 10 objects to tell "how many?" Students compare numbers and objects between 0-10. Students can describe shapes and explain position of objects. Students describe and compare measurable attributes of objects.

KEY CONCEPTS	KEY TERMS	
• Rote count to 50 by ones and tens starting at any number • Write numbers 0-10 • Count objects to 10 • Compare numbers 0-10	• Ones • Tens • Compare • More • Less • Equal • Length • Weight • Height	• Width • Flat shape • Solid shape • Above • Below • Beside • In front of • Behind • Next to

UNIT STANDARDS
K.CC.1: Count to 100 by ones and by tens. *May want to intersect Practice Standards 7 and 8 with this standard.

K.CC.2: Count forward beginning from a given number within the known sequence (instead of having to begin at 1). *May want to intersect Practice Standards 7 and 8 with this standard.

K.CC.3: Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects). *May want to intersect Practice Standard 6 with this standard.

K.CC.5: Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects. *May want to intersect Practice Standard 7 with this standard.

K.CC.6: Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group. *May want to intersect Practice Standards 2 and 4 with this standard.

K.CC.7 Compare two numbers between 1 and 10 presented as written numerals. *May want to intersect Practice Standards 2 and 4 with this standard.

K.MD.1: Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. *May want to intersect Practice Standard 3 with this standard.

K.G.1: Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*. *May want to intersect Practice Standards 3 and 4 with this standard.

Unit 2 Map: Kindergarten

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Second Quarter: Kindergarten

November: UNIT 3

UNIT 3 OVERVIEW
Students will know number names and the count sequence. Students will also understand addition as putting together and adding to, and understanding subtraction as taking apart and taking from.

KEY CONCEPTS	KEY TERMS	
• Rote count to 70 by ones and tens starting at any number • Write numbers 0-15 • Count objects to 15 • Addition and subtraction within 5	• Zero • Add • Equal • Subtract	• Minus • Difference • Decompose • Compose

UNIT STANDARDS
K.CC.1: Count to 100 by ones and by tens. *May want to intersect Practice Standards 7 and 8 with this standard.

K.CC.2: Count forward beginning from a given number within the known sequence (instead of having to begin at 1). *May want to intersect Practice Standards 7 and 8 with this standard.

K.CC.3: Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects). *May want to intersect Practice Standard 6 with this standard.

K.OA.1: Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. *May want to intersect Practice Standard 4 with this standard.

K.OA.3: Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$). *May want to intersect Practice Standard 4 with this standard.

K.OA.4: For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation. *May want to intersect Practice Standard 4 with this standard.

Unit 3 Map: Kindergarten

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Re Think!
MATHEMATICS

Second Quarter: Kindergarten

December-January: UNIT 4

UNIT 4 OVERVIEW

Students use numbers, including written numerals, to represent quantities and to solve quantitative problems, such as counting objects in a set; counting out a given number of objects; comparing sets or numerals; and modeling simple joining and separating situations with sets of objects, or eventually with equations such as $3 + 2 = 5$ and $75 – 2 = 3$. (Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but it is not required.) Students count and produce sets of given sizes up to 20, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away.

KEY CONCEPTS	KEY TERMS	
• Rote count to 100 by ones and tens from any #	• Hundred	• Minus
• Write numbers 0-20	• Ten	• Difference
• Count objects to 20	• Number line	• More
• Solve word problems involving + and - to 5	• Add	• Less
• Practice composing and decomposing to 10	• Equal	• Larger
	• Subtract	

UNIT STANDARDS

K.CC.1: Count to 100 by ones and by tens. *May want to intersect Practice Standards 7 and 8 with this standard.

K.CC.2: Count forward beginning from a given number within the known sequence (instead of having to begin at 1). *May want to intersect Practice Standards 7 and 8 with this standard.

K.CC.3: Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects). *May want to intersect Practice Standard 6 with this standard.

K.CC.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects. *May want to intersect Practice Standard 6 with this standard.

K.OA.1: Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. *May want to intersect Practice Standards 2 and 5 with this standard.

K.OA.2: Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem. *May want to intersect Practice Standards 1 and 4 with this standard.

K.OA.3: Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$). *May want to intersect Practice Standards 4 and 5 with this standard.

K.OA.4: For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation. *May want to intersect Practice Standards 2, 4, and 7 with this standard.

Unit 4 Map: Kindergarten

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: Kindergarten

February-March: UNIT 5

UNIT 5 OVERVIEW
Students use basic shapes and spatial reasoning to model objects in their environment and to construct more complex shapes. They classify objects or people into given categories and can sort the categories by the count of each category as well. Students solve addition and subtraction word problems within 10 by using objects or drawings to represent the problem. Students fluently add and subtract within 5.

KEY CONCEPTS	KEY TERMS	
• Rote count to 100 by ones and tens starting at any number	• Classify	• Similar
• Write numbers 0-20	• Categories	• Match
• Count objects to 20	• Compare	• Different
• Addition and subtraction within 10	• Combine	• Combine
• Fluently add and subtract within 5	• Sort	• Problem
	• Group	• Solve
	• Alike	

UNIT STANDARDS
K.CC.1: Count to 100 by ones and by tens. *May want to intersect Practice Standards 7 and 8 with this standard.

K.CC.2: Count forward beginning from a given number within the known sequence (instead of having to begin at 1). *May want to intersect Practice Standards 7 and 8 with this standard.

K.CC.3: Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects). *May want to intersect Practice Standard 6 with this standard.

K.CC.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects. *May want to intersect Practice Standard 7 with this standard.

K.OA.2: Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem. *May want to intersect Practice Standard 1 with this standard.

K.OA.4: For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation. *May want to intersect Practice Standard 6 with this standard.

K.MD.3: Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. *May want to intersect Practice Standard 7 with this standard.

K.G.6: Compose simple shapes to form larger shapes. For example "Can you join these two triangles with full sides touching to make a rectangle?" *May want to intersect Practice Standard 4 with this standard.

Unit 5 Map: Kindergarten

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: Kindergarten

UNIT 6 OVERVIEW

Students work with numbers 11–19 to gain foundations for place value of tens and ones. Students directly compare two objects with a measurable attribute in common and develop understanding of ordinal numbers. Students analyze and compare two and three dimensional shapes as well as model and draw shapes.

KEY CONCEPTS		KEY TERMS		
• Place value to 19 (tens and ones)	• Place value	• More	• Smaller	• Short
• Compare two objects related to measureable attributes	• Compare	• Less	• Smallest	• Shorter
	• Attribute	• Estimate	• Big	• Shortest
	• Sides	• Measure	• Bigger	• Tall
• Ordinal numbers	• Corners	• Length	• Biggest	• Taller
• Draw shapes	• Vertex	• Weight	• Long	• Tallest
	• Similar	• Height	• Longer	• Ordinal number: first, second, third, etc.
	• Different	• Small	• Longest	

UNIT STANDARDS

K.NBT.1: Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones. *May want to intersect Practice Standards 2 and 4 with this standard.

K.MD.2: Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter. *May want to intersect Practice Standards 3 and 7 with this standard.

K.CC.4: Understand the relationship between numbers and quantities; connect counting to cardinality. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. Understand that each successive number name refers to a quantity that is one larger. Develop understanding of ordinal numbers (first through tenth) to describe the relative position and magnitude of whole numbers. *May want to intersect Practice Standard 2 with this standard.

K.G.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices) and other attributes (e.g., having sides of equal length). *May want to intersect Practice Standards 3 and 7 with this standard.

K.G.5: Model shapes in the world by building shapes from components (e.g. sticks and clay balls) and drawing shapes. *May want to intersect Practice Standard 4 with this standard.

Unit 6 Map: Kindergarten

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Grade Level Common Core Resources: 1st Grade

Standards Overview
Previous Grade Level Standards
- (K) Rote count numbers to 100 by ones and tens starting at any number
- (K) Count objects to 20
- (K) Read and write numbers 0 - 20 correctly
- (K) Compare numbers 1-10
- (K) Solve addition and subtraction within 10
- (K) Fluently add and subtract within 5
- (K) Place Value to 19
- (K) Correctly name shapes: squares, circles, triangles, rectangles, hexagons; cubes, cones, cylinders, spheres

1.OA: Operations and Algebraic Thinking
1. Solve word problems using addition and subtraction up to 20.
2. Solve word problems up to 20 using addition of three numbers.
3. Apply properties of operations as strategies to add and subtract: Commutative Property: if 8+3=11 then 3+8 =11; Associative Property: if 2+4+6=12 then 2+10=12.
4. Understand subtraction as an unknown addend problem: Subtract 10 – 8 by finding the number that makes 10 when added to 8.
5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).
6. Add and subtract within 20, demonstrating **fluency for addition and subtraction within 10**: Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$).
7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.
    - 7.1. Write and solve number sentences from problem situations that express relationships involving adding and subtraction within 20. *CA Addition
8. Determine the unknown whole number in an addition or subtraction equations relating three whole numbers; $8 + ? = 11, 5 = ? – 3, 6 + 6 = ?$.

1.NBT: Number and Operations in Base Ten
1. Count to 1 to 120 from any number; read and write numbers from 1-120.
2. Place Value (tens and ones)
3. Compare two digit numbers using $<$, $>$, or $=$.
4. Add within 100 (2 digit by 1 digit; 2 digit by multiple of 10).
5. Given a two-digit number, mentally find 10 more or 10 less.
6. Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90.

1.MD: Measurement and Data
1. Measure lengths indirectly.
2. Understand concept of whole number length units.
3. Tell time to the hour and half hour.
    - 3.1. Relate time to events (e.g., before/after, shorter/longer). *CA Addition
4. Organize, represent, and interpret data.
    - 4.1. Describe, extend, and explain ways to get to a next element in simple repeating patterns (e.g., rhythmic, numeric, color, and shape). *CA Addition
5. Identify the name and value of all coins to a dollar. *CA Addition

1.G: Geometry
1. Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size).
2. Compose shapes into new shapes.
3. Partition circles and rectangles into 2 and 4 equal shares; describe using words halves, fourths, quarters.

Unpacking the Common Core State Standards: 1st Grade
This link from the Public Schools of North Carolina State Board of Education will help teachers understand the standards and demonstrate the level of knowledge and skills students are expected to master. Please note that California additions to the CCSS are listed in the Standards Overview at each grade level.

Year-at-a-Glance: 1st Grade

September-October: UNIT 1		
Teach	• Counting to 120 • Place value	• Comparing numbers • Understand = sign
Assess	Grade K Previous Grade Level Standards Checkpoints	
Re-Teach	Grade K Previous Grade Level Standards as data shows	

November-December: UNIT 2		
Teach	• Mentally + and – 2-digit numbers • Subtract multiples of 10 • Understand subtraction	• Apply properties of operations to addition and subtraction • Relate counting to + and
Assess	Grade K Previous Grade Level and Unit 1 Standards Checkpoints	
Re-Teach	Grade K Previous Grade Level and Unit 1 Standards as data shows	

January: UNIT 3		
Teach	• Determine unknown whole numbers in equations	• + and – word problems • Add within 100
Assess	Grade K Previous Grade Level and Units 1-2 Standards Checkpoints	
Re-Teach	Grade K Previous Grade Level and Units 1-2 Standards as data shows	

February: UNIT 4		
Teach	• 3-number word problems to 20	• Fluently + and – within 10
Assess	Grade K Previous Grade Level and Units 1-3 Standards Checkpoints	
Re-Teach	Grade K Previous Grade Level and Units 1-3 Standards as data shows	

March: UNIT 5		
Teach	• Recognize coins and their value • Tell time to hour and half-hour	• Measurement word problems
Assess	Grade K Previous Grade Level and Units 1-4 Standards Checkpoints	
Re-Teach	Grade K Previous Grade Level and Units 1-4 Standards as data shows	

April: UNIT 6		
Teach	• Measure length indirectly • Understand concept of length units	• Organize, represent, and interpret data
Assess	Grade K Previous Grade Level and Units 1-5 Standards Checkpoints	
Re-Teach	Grade K Previous Grade Level and Units 1-5 Standards as data shows	

May: UNIT 7		
Teach	• Distinguish shapes' defining attributes • Compose shapes into new shapes	• Partition shapes into equal shares
Assess	Grade K Previous Grade Level and Units 1-6 Standards Checkpoints	
Re-Teach	Grade K Previous Grade Level and Units 1-6 Standards as data shows	

June	
Assess	Grade K Previous Grade Level and Units 1-6 Standards Checkpoints
Re-Teach	Grade K Previous Grade Level and Units 1-6 Standards as data shows

Re Think!
MATHEMATICS

First Quarter: 1ˢᵗ Grade

September-October: UNIT 1

UNIT 1 OVERVIEW
Students extend the counting sequence to 120. They think of whole numbers between 10 and 100 in terms of tens and ones (especially recognizing the numbers 11 to 19 as composed of a ten and some ones). Students use their understanding of place value to compare two digit numbers using the symbols >, =, and <.

KEY CONCEPTS	KEY TERMS	
• Count to 120 • Place value (tens and ones) • Compare 2 digit numbers using >, =, and < • Understand the meaning of the equal sign	• Tens • Ones • Hundred • Place value • Compare	• Equal • Less than • More than • Expanded notation • Equal sign • Equals

UNIT STANDARDS
1.NBT.1: Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral. *May want to intersect Practice Standards 7 and 8 with this standard.

1.NBT.2: Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: 10 can be thought of as a bundle of ten ones — called a "ten". The numbers from 11 to 19 are composed of ten and one, two, three, four, five, six, seven, eight, or nine ones. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones). *May want to intersect Practice Standards 2 and 4 with this standard.

1.NBT.3: Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <. *May want to intersect Practice Standards 2 and 4 with this standard.

1.OA.7: Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6 = 6, 7 = 8 - 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2$. *May want to intersect Practice Standards 2-4 with this standard.

Unit 1 Map: 1st Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Second Quarter: 1ˢᵗ Grade

UNIT 2 OVERVIEW

Students develop, discuss, and use efficient, accurate, and generalizable methods to subtract multiples of 10 and mentally find ten more and ten less from any given number within 120. Students develop strategies for adding and subtracting whole numbers based on their prior work with small numbers. They use a variety of models, including discrete objects and length-based models (e.g., cubes connected to form lengths); to model, add-to, take-from, put-together, take-apart, and compare situations to develop meaning for the operations of addition and subtraction. Students understand connections between counting and addition and subtraction (e.g., adding two is the same as counting by twos).

KEY CONCEPTS	KEY TERMS	
• Subtract multiples of 10 from multiples of 1	• Ten more	• Addition
• Mentally find ten more and ten less	• Ten less	• Subtraction
• Strategies for adding and subtracting whole numbers	• Multiple	• Difference
• Introduce addition and subtraction equations	• Mentally	• Equation

UNIT STANDARDS

1.NBT.5: Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. *May want to intersect Practice Standards 3 and 7 with this standard.

1.NBT.6: Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. *May want to intersect Practice Standards 3 and 4 with this standard.

1.OA.3: Apply properties of operations as strategies to add and subtract. *Examples: If 8 + 3 = 11 is known Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)* *May want to intersect Practice Standards 2 and 3 with this standard.

1.OA.4: Understand subtraction as an unknown-addend problem. For example, subtract 10 – 8 by finding the number that makes 10 when added to 8. Add and subtract within 20. *May want to intersect Practice Standards 2 and 3 with this standard.

1.OA.5: Relate counting to addition and subtraction (e.g., by counting on 2 to add 2). *May want to intersect Practice Standards 7 and 8 with this standard.

Unit 2 Map: 1st Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 1ˢᵗ Grade

January: UNIT 3

UNIT 3 OVERVIEW
Students develop, discuss, and use efficient, accurate, and generalizable methods to subtract multiples of 10 and mentally find ten more and ten less from any given number within 120. Students develop strategies for adding and subtracting whole numbers based on their prior work with small numbers. They use a variety of models, including discrete objects and length-based models (e.g., cubes connected to form lengths); to model, add-to, take-from, put-together, take-apart, and compare situations to develop meaning for the operations of addition and subtraction. Students solve addition and subtraction problems within 20. They develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10. Students represent and solve problems involving addition and subtraction.

KEY CONCEPTS	KEY TERMS	
• Strategies for adding and subtracting whole numbers • Introduce addition and subtraction equations • Addition and subtraction word problems • Addition and subtraction equations	• Total • Number sentence • Addition • Subtraction • Difference • Equation	• Model • Unknown • Word problems • Story problems • Add to • Take from • Put together • Take apart

UNIT STANDARDS
1.OA.8: Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 + ? = 11$, $5 = \_ - 3$, $6 + 6 = \_$. *May want to intersect Practice Standard 6 with this standard.

1.NBT.4: Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. *May want to intersect Practice Standards 2-4 with this standard.

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

Unit 3 Map: 1st Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 1st Grade

February: UNIT 4

UNIT 4 OVERVIEW
Students use a variety of strategies and the properties of addition to add whole numbers and to create and use increasingly sophisticated strategies based on these properties (e.g., "making tens") to solve addition and subtraction problems within 20. By comparing a variety of solution strategies, children build their understanding of the relationship between addition and subtraction. Students develop fluency adding and subtracting within 10.

KEY CONCEPTS	KEY TERMS	
• Add and subtract within 20	• Fluency	• Making ten
• Fluently add and subtract within 10	• Strategy	• Number sentence
• Add three numbers	• Counting on	• Sum

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

1.OA.2: Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. *May want to intersect Practice Standards 1 and 4 with this standard.

Unit 4 Map: 1st Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 1ˢᵗ Grade

March: UNIT 5

UNIT 5 OVERVIEW
Students work with addition and subtraction equations as well as tell and write time to the hour and half hour. Student also Identify coins, their names and values.

KEY CONCEPTS	KEY TERMS	
• Time to the hour and half • Addition and subtraction word problems • Money: Identify coins, their names, and values	• Hour • Half hour • Minute hand • Hour hand • Minutes • Seconds • Day • Money • Currency	• Coin • Dollar • Half dollar • Quarter • Dime • Nickel • Penny • Cent

UNIT STANDARDS
1.MD.3: Tell and write time in hours and half-hours using analog and digital clocks. Recognize and identify coins, their names, and their value. *May want to intersect Practice Standard 5 with this standard.

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

Unit 5 Map: 1st Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 1st Grade

April: UNIT 6

UNIT 6 OVERVIEW
Students develop an understanding of the meaning and processes of measurement, including underlying concepts such as iterating (the mental activity of building up the length of an object with equal-sized units) and the transitivity principle for indirect measurement. Students organize, represent, and interpret data with up to three categories.

KEY CONCEPTS	KEY TERMS	
• Measure length indirectly • Order three objects according to length • Organize, represent, and interpret data in up to three categories	• Compare • End to end • Gaps • Overlaps • Graph • Data	• Category • Organize • Represent • Analyze • Organize • Tally

UNIT STANDARDS
1.MD.1: Order three objects by length; compare the lengths of two objects indirectly by using a third object. *May want to intersect Practice Standards 3 and 4 with this standard.

1.MD.2: Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.* *May want to intersect Practice Standards 2 and 6 with this standard.

1.MD.4: Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. *May want to intersect Practice Standards 7 and 4 with this standard.

Unit 6 Map: 1st Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 1st Grade

May: UNIT 7

UNIT 7 OVERVIEW

Students compose and decompose plane or solid figures (e.g., put two triangles together to make a quadrilateral) and build understanding of part-whole relationships as well as the properties of the original and composite shapes. As students combine shapes, they recognize them from different perspectives and orientations, describe their geometric attributes, and determine how they are alike and different. This work will develop the background for measurement and for initial understandings of properties such as congruence and symmetry.

KEY CONCEPTS	KEY TERMS	
• Reason with shapes and their attributes • Partition circles and rectangles into two equal shares • Partition circles and rectangles into four equal shares	• Defining-attributes • Non-defining attributes • Closed • Color • Size • Orientation	• Composite • Partition • Equal share • Whole • Half • Halves • Fourths • Quarters

UNIT STANDARDS

1.G.1: Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes. *May want to intersect Practice Standards 4 and 7 with this standard.

1.G.2: Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. *May want to intersect Practice Standards 4 and 7 with this standard.

1.G.3: Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares. *May want to intersect Practice Standards 2 and 7 with this standard.

Unit 7 Map: 1st Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

ReThink
MATHEMATICS

Grade Level Common Core Resources: 2nd Grade

Standards Overview
Previous Grade Level Standards
    (1st) Count, read and write numbers to 120.
    (1st) Compare two digit numbers.
    (1st) Fluently add and subtract within 10.
    (1st) Add and subtract to 20.
    (1st) Place Value (tens and ones)
    (1st) Measure lengths indirectly.
    (1st) Understand concept of whole number length units.
    (1st) Tell time to the hour and half hour.
    (1st) Organize, represent, and interpret data.
    (1st) Reason with shapes and their attributes *introducing concept of halves and fourths. *(Squares, circles, triangles, rectangles, hexagons; cubes, cones, cylinders, spheres)*

2.OA: Operations and Algebraic Thinking
1. Solve word problems using addition and subtraction up to 100.
2. Fluently add and subtract within 20.
3. Odd/Even (concept of equal groups).
4. Use addition to understand rectangular arrays (up to 5 x 5).
5. *Use repeated addition and counting by multiples to demonstrate multiplication.
6. *Use repeated subtraction and equal group sharing to demonstrate division.
    *CA Addition

2.NBT: Number and Operations in Base Ten
1. Place Value (hundreds, tens and ones)
2. Count and skip count to 1,000.
3. Read and write numbers to 1,000 (base ten numerals, number names, expanded form).
4. Compare three digit numbers using <, >, or =.
5. Fluently add and subtract within 100.
6. Add up to 4 two-digit numbers.
7. Add and subtract within 1,000.
    7.1. Use estimation strategies in computation and problem solving with #s up to 1,000. *CA Addition
    7.1. Make reasonable estimates when adding or subtracting. *CA Addition
8. Mentally add and subtract 10 or 100 to a given number 100–900.
9. Explain why addition and subtraction strategies work.

2.MD: Measurement and Data
1-4. Measure and estimate lengths in standard units (inches, feet, centimeters, meters).
5-6. Relate addition and subtraction to length.
7. Tell and write time to the nearest 5 minutes (using am and pm).
    7.1. Know minutes in an hour, days in a month, weeks in a year *CA Addition
8. Solve word problems involving combinations of money. Use the $ and c signs correctly.
9. Generate measurement data using a line plot with whole units.
10. Draw and interpret picture graphs and bar graphs (up to four categories in data set).

2.G: Geometry
1. Recognize and draw shapes based on specific attributes given (add pentagons and quadrilaterals).
2. Partition a rectangle into rows and columns of same-size squares and count to find total.
3. Partition circles and rectangles into two, three and four equal shares (describe using the words half of, thirds, third of, fourths, and quarters).

Unpacking the Common Core State Standards: 2nd Grade

This link from the Public Schools of North Carolina State Board of Education will help teachers understand the standards and demonstrate the level of knowledge and skills students are expected to master. Please note that California additions to the CCSS are listed in the Standards Overview at each grade level.

Year-at-a-Glance: 2nd Grade

September-October: UNIT 1		
Teach	• Understand place value • Fluently + and – within 20	• Read, write, and compare numbers within 1,000
Assess	Grade 1 Previous Grade Level Standards Checkpoints	
Re-Teach	Grade 1 Previous Grade Level Standards as data shows	

November: UNIT 2		
Teach	• Count within 1,000 • Skip-count by 5s, 10s, and 100s	• Tell and write time to nearest 5 minutes
Assess	Grade 1 Previous Grade Level and Unit 1 Standards Checkpoints	
Re-Teach	Grade 1 Previous Grade Level and Unit 1 Standards as data shows	

December-January: UNIT 3		
Teach	• Place value understanding to + and – within 100 • Properties of operations to + and – within 100	• Mentally + and – 10 and 100 to any number within 100-900
Assess	Grade 1 Previous Grade Level and Units 1-2 Standards Checkpoints	
Re-Teach	Grade 1 Previous Grade Level and Units 1-2 Standards as data shows	

January-February: UNIT 4		
Teach	• Fluently + and – within 100	• + and – within 1,000
Assess	Grade 1 Previous Grade Level and Units 1-3 Standards Checkpoints	
Re-Teach	Grade 1 Previous Grade Level and Units 1-3 Standards as data shows	

March: UNIT 5		
Teach	• Word problems with money	• Add four 2-digit numbers
Assess	Grade 1 Previous Grade Level and Units 1-4 Standards Checkpoints	
Re-Teach	Grade 1 Previous Grade Level and Units 1-4 Standards as data shows	

April-May: UNIT 6		
Teach	• Measure and estimate lengths in standard units	• Relate addition and subtraction to length
Assess	Grade 1 Previous Grade Level and Units 1-5 Standards Checkpoints	
Re-Teach	Grade 1 Previous Grade Level and Units 1-5 Standards as data shows	

April-May: UNIT 7		
Teach	• Even and odd numbers	• Arrays
Assess	Grade 1 Previous Grade Level and Units 1-6 Standards Checkpoints	
Re-Teach	Grade 1 Previous Grade Level and Units 1-6 Standards as data shows	

April-May: UNIT 8		
Teach	• Bar graphs and pictographs	• Display data on a line plot
Assess	Grade 1 Previous Grade Level and Units 1-7 Standards Checkpoints	
Re-Teach	Grade 1 Previous Grade Level and Units 1-7 Standards as data shows	

April-May: UNIT 9		
Teach	• Reason with shapes and their attributes	
Assess	Grade 1 Previous Grade Level and Units 1-8 Standards Checkpoints	
Re-Teach	Grade 1 Previous Grade Level and Units 1-8 Standards as data shows	

June	
Assess	Grade 1 Previous Grade Level and Units 1-9 Standards Checkpoints
Re-Teach	Grade 1 Previous Grade Level and Units 1-9 Standards as data shows

First Quarter: 2nd Grade

September-October: UNIT 1

UNIT 1 OVERVIEW
Students extend their understanding of the base-ten system. This includes ideas comparing numbers. Students understand multi-digit numbers (up to 1000) written in base-ten notation, recognizing that the digits in each place represent amounts of thousands, hundreds, tens, or ones (e.g., 853 is 8 hundreds + 5 tens + 3 ones). Students develop fluency with addition and subtraction within 20.

KEY CONCEPTS		KEY TERMS	
• Understand place value • Fluently add and subtract within 20 • Read, write, and compare numbers within 1,000	• Place value • Digit • Ones • Tens • Hundreds • Thousand • Bundle	• Expanded form • Fluently • Greater than • Less than • Equal to • Sum • Difference	

UNIT STANDARDS
2.NBT.1: Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: 100 can be thought of as a bundle of ten tens — called a "hundred." The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones). *May want to intersect Practice Standards 2, 4, and 8 with this standard.

2.NBT.3: Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. *May want to intersect Practice Standards 4 and 6 with this standard.

2.NBT.4: Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons. *May want to intersect Practice Standards 4 and 6 with this standard.

2.OA.2: Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers. *May want to intersect Practice Standards 6 and 8 with this standard.

Unit 1 Map: 2nd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Second Quarter: 2nd Grade

November: UNIT 2

UNIT 2 OVERVIEW
Students extend their understanding of the base-ten system. This includes ideas of counting in fives, tens, and multiples of hundreds, tens, and ones. Students understand how to tell and write time including the use of a.m. and p.m.

KEY CONCEPTS	KEY TERMS	
• Count within 1,000	• Ones	• Minute
• Skip-count by 5s, 10s, and 100s	• Tens	• Hour
• Tell and write time to the nearest 5 minutes	• Hundreds	• Quarter-hour
	• Thousand	• Half-hour
	• Bundle	• A.m.
	• Second	• P.m.

UNIT STANDARDS
2.NBT.2: Count within 1000; skip-count by 5s, 10s, and 100s. *May want to intersect Practice Standard 8 with this standard.

2.MD.7: Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m. *May want to intersect Practice Standard 6 with this standard.

Unit 2 Map: 2nd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Second Quarter: 2nd Grade

December-January: UNIT 3

UNIT 3 OVERVIEW

Students use their understanding of addition to develop fluency with addition and subtraction within 100. They solve problems within 100 by applying their understanding of models for addition and subtraction, and they develop, discuss, and use efficient, accurate, and generalizable methods to compute sums and differences of whole numbers in base-ten notation, using their understanding of place value and the properties of operations. They select and accurately apply methods that are appropriate for the context and the numbers involved to mentally calculate sums and differences for numbers with only tens or hundreds.

KEY CONCEPTS	KEY TERMS	
• Place value understanding to add and subtract within 100	• Expanded notation	• Unknown
• Properties of operations to add and subtract within 100	• Place value models	• Adding to
	• Number Sentence	• Taking from
• Mentally add and subtract 10 and 100 to any number within 100-900.	• Equation	• Putting together
	• Solve	• Taking apart
	• Symbol	• Comparing

UNIT STANDARDS

2.NBT.9: Explain why addition and subtraction strategies work, using place value and the properties of operations. *May want to intersect Practice Standard 3 with this standard.

2.NBT.8: Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900. *May want to intersect Practice Standard 7 with this standard.

2.OA.1: Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. *May want to intersect Practice Standards 1 and 4 with this standard.

Unit 3 Map: 2nd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 2nd Grade

UNIT 4 OVERVIEW
Students fluently add and subtract within 100. Students use their understanding of addition to develop fluency with addition and subtraction within 1000. They solve problems within 1000 by applying their understanding of models for addition and subtraction, and they develop, discuss, and use efficient, accurate, and generalizable methods to compute sums and differences of whole numbers in base-ten notation, using their understanding of place value and the properties of operations.

KEY CONCEPTS	KEY TERMS	
• Fluently add and subtract within 100. • Add and subtract within 1,000.	• Number sentence • Equation • Problem solve • Expanded notation	• Place value models • Compose • Decompose • Strategy

UNIT STANDARDS
2.NBT.7: Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds. *May want to intersect Practice Standard 3 with this standard.

2.NBT.5: Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. *May want to intersect Practice Standards 6 and 8 with this standard.

Unit 4 Map: 2nd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 2nd Grade

March: UNIT 5

UNIT 5 OVERVIEW

Using their understanding of addition, students solve addition problems with up to four two-digit numbers in the same problem. Students solve word problems involving dollar bills, quarters, dimes, nickels, and pennies.

KEY CONCEPTS		KEY TERMS	
• Word problems with money • Add four 2-digit numbers	• Coins • Dollar bills • Quarter • Dime • Nickel	• Penny • Cent • Number sentence • Equation	

UNIT STANDARDS

2.NBT.6: Add up to four two-digit numbers using strategies based on place value and properties of operations. *May want to intersect Practice Standards 6 and 8 with this standard.

2.MD.8: Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have? *May want to intersect Practice Standards 1 and 4 with this standard.

Unit 5 Map: 2nd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Re Think!
MATHEMATICS

Fourth Quarter: 2nd Grade

April-May: UNIT 6

UNIT 6 OVERVIEW
Students recognize the need for standard units of measure (centimeter and inch) and they use rulers and other measurement tools with the understanding that linear measure involves an iteration of units. They recognize that the smaller the unit the more iterations they need to cover a given length.

KEY CONCEPTS	KEY TERMS	
• Measure and estimate lengths in standard units • Relate addition and subtraction to length	• Place value • Digit • Ones • Tens • Hundreds • Thousand • Regroup • Sum • Addition	• Addend • Subtraction • Difference • Number sentence • Minus • Plus • Solve • Operation • Equation

UNIT STANDARDS
2.MD.1: Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. *May want to intersect Practice Standards 5 and 6 with this standard.

2.MD.2: Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen. *May want to intersect Practice Standards 3 and 6 with this standard.

2.MD.3: Estimate lengths using units of inches, feet, centimeters, and meters. *May want to intersect Practice Standard 7 with this standard.

2.MD.4: Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit. *May want to intersect Practice Standard 6 with this standard.

2.MD.5: Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. *May want to intersect Practice Standards 1 and 4 with this standard.

2.MD.6: Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, etc. and represent whole-number sums and differences within 100 on a number line diagram. *May want to intersect Practice Standards 5 and 7 with this standard.

Unit 6 Map: 2nd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 2nd Grade

April-May: UNIT 7

UNIT 7 OVERVIEW
Students work with equal groups of objects to gain foundations for multiplication.

KEY CONCEPTS		KEY TERMS
• Even and odd numbers • Arrays	• Solve • Put together • Take apart • Compare • Rows • Columns	• Odd • Even • Whole unit • Horizontal • Vertical

UNIT STANDARDS
2.OA.3: Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s, and write an equation to express an even number as a sum of two equal addends. *May want to intersect Practice Standards 2 and 7 with this standard.

2.OA.4: Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends. *May want to intersect Practice Standards 2 and 7 with this standard.

Unit 7 Map: 2nd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 2nd Grade

April-May: UNIT 8

UNIT 8 OVERVIEW
Students represent and interpret data.

KEY CONCEPTS	KEY TERMS
• Bar graphs and pictographs • Display data on a line plot	• Picture graph • Bar graph • Rows Columns • Horizontal • Vertical

UNIT STANDARDS
2.MD.9: Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units. *May want to intersect Practice Standards 5 and 6 with this standard.

2.MD.10: Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. *May want to intersect Practice Standards 1 and 4 with this standard.

Unit 8 Map: 2nd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 2nd Grade

April-May: UNIT 9

UNIT 9 OVERVIEW
Students describe and analyze shapes by examining their sides and angles. Students investigate, describe, and reason about decomposing and combining shapes to make other shapes. Through building, drawing, and analyzing two and three-dimensional shapes, students develop a foundation for understanding area, volume, congruence, similarity, and symmetry in later grades.

KEY CONCEPTS		KEY TERMS
• Reason with shapes and their attributes	• Attributes • Triangles • Quadrilaterals • Pentagons • Hexagons • Cubes • Angles • Faces • Quadrilaterals • Pentagons	• Hexagon • Third • Third of • Half • Half of • Fourth • Fourth of • Rows • Columns

UNIT STANDARDS
2.G.1: Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. *May want to intersect Practice Standard 4 with this standard.

2.G.2: Partition a rectangle into rows and columns of same-size squares and count to find the total number of them. *May want to intersect Practice Standard 4 with this standard.

2.G.3: Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape. *May want to intersect Practice Standards 2 and 4 with this standard.

Unit 9 Map: 2nd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Grade Level Common Core Resources: 3rd Grade

Standards Overview
Previous Grade Level Standards
- (2nd) Count, read and write numbers to 1,000.
- (2nd) Compare three digit numbers using <, >, or =.
- (2nd) Add and subtract to 1,000.
- (2nd) Fluently add and subtract within 20.
- (2nd) Place Value (hundreds, tens and ones)
- (2nd) Measure and estimate lengths in standard units (inches, feet, centimeters, meters).
- (2nd) Tell time to the nearest 5 minutes.
- (2nd) Solve word problems involving money using the $ and c signs correctly.
- (2nd) Organize, represent, and interpret data.
- (2nd) Reason with shapes and their attributes *introduce concept of thirds, halves and fourths *(squares, circles, triangles, rectangles pentagons, quadrilaterals, hexagons; cubes, cones, cylinders, spheres).*

3.OA: Operations and Algebraic Thinking
1. Interpret products of whole numbers i.e. 5 groups of 7 objects each, or 7 groups of 5 objects each.
2. Interpret whole number quotients of whole numbers.
3. Use multiplication and division within 100 to solve word problems.
4. Determine the unknown whole number in a multiplication or division equations.
5. Apply properties of operations as strategies to multiply and divide (Associative, Commutative, Distributive properties).
6. Understand division as an unknown-factor problem.
7. Fluently multiply and divide within 100.
8. Solve two-step word problems using the four operations.
9. Identify arithmetic patterns and explain them using properties of operations.

3.NBT: Number and Operations in Base Ten
- 1.1. Place Value to 10,000. *CA Addition
1. Round whole numbers to the nearest 10 or 100.
2. Fluently add and subtract within 1,000.
3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90.

3.NF: Number and Operations - Fractions
1. Understand concept of fractions.
2. Understand a fraction as a number on the number line.
3. Explain equivalence of fractions and compare fractions by reasoning about size *¼ of a dollar=25 cents etc.

3.MD: Measurement and Data
1. Tell and write time to the nearest minute.
2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Solve word problems involving measurement using the four operations.
3. Draw a scaled picture graph and a scaled bar graph to represent data with several categories.
4. Generate measurement data using a line plot marked with halves and fourths of an inch.
5. Recognize and understand concept of area.
6. Measure area by counting unit squares.
7. Relate area to the operations of multiplication and addition.
8. Solve real world and mathematical problems involving perimeters of polygons.

3.G: Geometry
1. Understand that shapes in different categories (e.g., rhombi, rectangles….) may share attributes (e.g. having four sides), and that the shared attributes can define a larger category (e.g. quadrilaterals).
2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.

Unpacking the Common Core State Standards – 3rd Grade
This link from the Public Schools of North Carolina State Board of Education will help teachers understand the standards and demonstrate the level of knowledge and skills students are expected to master. Please note that California additions to the CCSS are listed in the Standards Overview at each grade level.

Year-at-a-Glance: 3rd Grade

September: UNIT 1		
Teach	• Rounding to the nearest 10 or 100 • Fluently + and – within 1,000	• Tell and write time to nearest minute • Real-world problems: perimeter
Assess	Grade 2 Previous Grade Level Standards Checkpoints	
Re-Teach	Grade 2 Previous Grade Level Standards as data shows	

October-November: UNIT 2		
Teach	• Interpret whole number products • Interpret whole number quotients	• and word problems within 100 • and with unknown numbers
Assess	Grade 2 Previous Grade Level and Unit 1 Standards Checkpoints	
Re-Teach	Grade 2 Previous Grade Level and Unit 1 Standards as data shows	

December-January: UNIT 3		
Teach	• Relationships between operations • Fluently x and ÷ within 100	• Word problems using +, -, x, ÷ • Mult. one-digit #s by multiples of 10
Assess	Grade 2 Previous Grade Level and Units 1-2 Standards Checkpoints	
Re-Teach	Grade 2 Previous Grade Level and Units 1-2 Standards as data shows	

January-February: UNIT 4		
Teach	• Introduction to fractions • Equivalent fractions	• Represent and interpret data using line plots
Assess	Grade 2 Previous Grade Level and Units 1-3 Standards Checkpoints	
Re-Teach	Grade 2 Previous Grade Level and Units 1-3 Standards as data shows	

March: UNIT 5		
Teach	• Area	• Perimeter
Assess	Grade 2 Previous Grade Level and Units 1-4 Standards Checkpoints	
Re-Teach	Grade 2 Previous Grade Level and Units 1-4 Standards as data shows	

March-April: UNIT 6		
Teach	• Elapsed time	• Bar and picture graphs	• Data analysis
Assess	Grade 2 Previous Grade Level and Units 1-5 Standards Checkpoints	
Re-Teach	Grade 2 Previous Grade Level and Units 1-5 Standards as data shows	

April-May: UNIT 7		
Teach	• Liquid volume and mass	
Assess	Grade 2 Previous Grade Level and Units 1-6 Standards Checkpoints	
Re-Teach	Grade 2 Previous Grade Level and Units 1-6 Standards as data shows	

May: UNIT 8		
Teach	• Partitioning shapes	• Classifying quadrilaterals
Assess	Grade 2 Previous Grade Level and Units 1-7 Standards Checkpoints	
Re-Teach	Grade 2 Previous Grade Level and Units 1-7 Standards as data shows	

June	
Assess	Grade 2 Previous Grade Level and Units 1-8 Standards Checkpoints
Re-Teach	Grade 2 Previous Grade Level and Units 1-8 Standards as data shows

First Quarter: 3rd Grade

September: UNIT 1

UNIT 1 OVERVIEW

Students use their understanding of place value to start rounding numbers. Students also use their understanding of place value and properties of operations to perform multi-digit arithmetic: Developing fluency of addition and subtraction within 1,000. Students apply these arithmetic skills into a variety of applications involving perimeter of polygons. Students extend their understanding of time to telling time to the minute.

KEY CONCEPTS		KEY TERMS
• Addition • Subtraction • Place value • Rounding • Telling time	• Rounding • Algorithm • Properties of operations • Perimeter • Area • Polygon	• Hour, minute, second • Rectangle • Sum • Difference • Regroup • Whole number • Digit • Estimation

UNIT STANDARDS

3.NBT.1: Use place value understanding to round whole numbers to the nearest 10 or 100. *May want to intersect Practice Standard 8 with this standard.

3.NBT.2: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. *May want to intersect Practice Standards 6 and 8 with this standard.

3.MD.8: Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. *May want to intersect Practice Standards 1, 4, and 3 with this standard.

3.MD.1: Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram. *May want to intersect Practice Standards 6 and 8 with this standard.

Unit 1 Map: 3rd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

First Quarter: 3ʳᵈ Grade

October-November: UNIT 2

UNIT 2 OVERVIEW

Students develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size.

KEY CONCEPTS	KEY TERMS	
• Multiplication of equal sized groups • Division of equal sized groups • Arrays • Area models	• Quotient • Product • Interpret • Equal shares • Equal groups • Quantity	• Row • Column • Array • Equation • Factor • Multiples

UNIT STANDARDS

3.OA.1: Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5×7. *May want to intersect Practice Standards 1, 2, and 3 with this standard.

3.OA.2: Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$. *May want to intersect Practice Standards 2 and 3 with this standard.

3.OA.4: Determine the unknown whole number in a multiplication equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$. *May want to intersect Practice Standard 7 with this standard.

3.OA.6: Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8. *May want to intersect Practice Standard 8 with this standard.

3.OA.3: Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. *May want to intersect Practice Standards 3 and 4 with this standard.

Unit 2 Map: 3rd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Second Quarter: 3rd Grade

Re Think MATHEMATICS

December-January: UNIT 3

UNIT OVERVIEW

Students use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division. Students fluently multiply and divide within 100.

KEY CONCEPTS		KEY TERMS	
• Exploring relationships between all four operations • Addition • Subtraction • Multiplication • Division	• Factor • Multiples • Operations • Order of operations • Quotient • Product	• Division • Multiplier • Minuend • Array • Quantity	

UNIT STANDARDS

3.OA.5: Apply properties of operations as strategies to multiply and divide. Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known (commutative property of multiplication). $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$ (associative property of multiplication). Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$ (distributive property). *May want to intersect Practice Standard 7 with this standard.

3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80, 5×60) using strategies based on place value and properties of operations. *May want to intersect Practice Standard 8 with this standard.

3.OA.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. *May want to intersect Practice Standards 1 and 7 with this standard.

3.OA.8: Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. *May want to intersect Practice Standards 1-3 with this standard.

3.OA.9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends. *May want to intersect Practice Standard 7 with this standard.

Unit 3 Map: 3rd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 3rd Grade

January-February: UNIT 4

UNIT 4 OVERVIEW

Students develop understanding of fractions as numbers. Students develop an understanding of fractions, beginning with unit fractions. Students are able to use fractions to represent numbers equal to, less than, and greater than one. They solve problems that involve comparing fractions by using visual fraction models and strategies based on noticing equal numerators or denominators. Students represent and interpret data.

KEY CONCEPTS	KEY TERMS	
• Introduction to fractions • Equivalent fractions with the denominators: 2, 3, 4, 6, 8 • Represent and interpret data using line plots	• Whole • Part • Fraction • Equivalent fractions • Numerator	• Denominator • Divisor • Relative • Number line

UNIT STANDARDS

3.NF.1: Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b. *May want to intersect Practice Standard 4 with this standard.

3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram: Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line. Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line. *May want to intersect Practice Standard 4 with this standard.

3.MD.4: Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters. *May want to intersect Practice Standards 1 and 5 with this standard.

3.NF.3: Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. Recognize and generate simple equivalent fractions (e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent (e.g., by using a visual fraction model). Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers (e.g., express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram). Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions (e.g., by using a visual fraction model). *May want to intersect Practice Standards 2 and 3 with this standard.

Unit 4 Map: 3rd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 3rd Grade

<table><tr><td>March: UNIT 5</td></tr></table>

UNIT 5 OVERVIEW
Students recognize area as an attribute of two-dimensional regions. They measure the area of a shape by finding the total number of same- size units of area required to cover the shape without gaps or overlaps, a square with sides of unit length being the standard unit for measuring area. Students understand that rectangular arrays can be decomposed into identical rows or into identical columns. By decomposing rectangles into rectangular arrays of squares, students connect area to multiplication, and justify using multiplication to determine the area of a rectangle. Students understand concepts of area and relate area to multiplication and to addition.

KEY CONCEPTS		KEY TERMS	
• Area	• Perimeter	• Area	• Sum
• Perimeter	• Polygon	• Square unit	• Length
	• Area	• Variable	• Height
	• Square unit	• Centimeter	• Width
	• Variable	• Meter	• Rectangle
	• Centimeter		• Mile
	• Meter		• Kilometer

UNIT STANDARDS
3.MD.5: Recognize area as an attribute of plane figures and understand concepts of area measurement. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. A plane figure, which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units. *May want to intersect Practice Standard 1 with this standard.

3.MD.6 Measure areas by counting unit squares (square cm, square m, square in, square ft., and improvised units). *May want to intersect Practice Standard 6 with this standard.

3.MD.7: Relate area to the operations of multiplication and addition. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems. *May want to intersect Practice Standards 2-4 with this standard.

3.MD.8: Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. *May want to intersect Practice Standards 1, 3, and 4 with this standard.

Unit 5 Map: 3rd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 3rd Grade

March-April: UNIT 6

UNIT 6 OVERVIEW
Students solve problems involving measurement and estimation of intervals of time. Students represent and interpret data.

KEY CONCEPTS	KEY TERMS	
• Elapsed time	• Interval	• Interpret
• Bar and picture graphs	• Hour	• Picture graph
• Data analysis	• Minute	• Bar graph
	• Second	• Pictograph
	• Clockwise	• Key
	• Counterclockwise	

UNIT STANDARDS
3.MD.1: Recognize area as an attribute of plane figures and understand concepts of area measurement. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. A plane figure, which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units. *May want to intersect Practice Standards 1, 3, and 4 with this standard.

3.MD.3: Measure areas by counting unit squares (square cm, square m, square in, square ft., and improvised units). *May want to intersect Practice Standards 4-6 with this standard.

Unit 6 Map: 3rd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 3rd Grade

April-May: UNIT 7

UNIT 7 OVERVIEW
Students solve problems involving measurement and liquid volumes and masses of objects.

KEY CONCEPTS	KEY TERMS	
• Liquid volume and mass	• Grams • Kilograms • Liters • Mass	• Volume • Capacity • Liquid volume

UNIT STANDARDS
3.MD.2: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units (e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem). *May want to intersect Practice Standard 6 with this standard.

Unit 7 Map: 3rd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Re Think
MATHEMATICS

Fourth Quarter: 3rd Grade

May: UNIT 8

UNIT 8 OVERVIEW
Students describe, analyze, and compare properties of two- dimensional shapes.

KEY CONCEPTS	KEY TERMS	
• Partitioning shapes • Classifying quadrilaterals	• Area • Quadrilateral • Rhombus • Rectangle • Square • Polygon • Octagon	• Symmetry • Congruent • Pentagon • Hexagon • Parallelogram • Partition

UNIT STANDARDS
3.G.1: Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. *May want to intersect Practice Standards 2 and 3 with this standard.

3.G.2: Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape. *May want to intersect Practice Standards 3 and 4 with this standard.

Unit 8 Map: 3rd Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Grade Level Common Core Resources: 4th Grade

Standards Overview
Previous Grade Level Standards
- (3rd) Count, read, write, and compare numbers to 10,000.
- (3rd) Fluently add and subtract within 1,000.
- (2nd) Fluently add and subtract within 20.
- (3rd) Place Value (thousands, hundreds, tens, and ones)
- (3rd) Round whole numbers to the nearest 10 or 100.
- (3rd) Concept of multiplication and division
- (3rd) Fluently multiply and divide within 100.
- (3rd) Multiply one-digit whole numbers by multiples of 10 in the range 10–90.
- (3rd) Concept of fraction using a number line
- (3rd) Equivalent fractions
- (3rd) Measure and estimate length, volume, and mass in standard units.
- (3rd) Tell time to the nearest minute.
- (2nd) Solve word problems involving money using the $ and ¢ signs correctly.
- (3rd) Organize, represent, and interpret data in scale applying fractions.
- (3rd) Area and perimeter
- (3rd) Reason with shapes and their attributes; understand the concept of equal parts of the whole.

4.OA: Operations and Algebraic Thinking
1-3. Use the four operations with whole numbers to solve problems.
4. Gain familiarity with factors, multiples, prime, and composite numbers.
5. Generate and analyze patterns.

4.NBT: Number and Operations in Base Ten
1. Understand place value for any digit in a whole number.
2. Read, write, and compare multi-digit whole #s using base-ten numerals, number names, and expanded form.
3. Round whole numbers to any place.
4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.
5. Multiply up to four digits by a one-digit whole number, and multiply two two-digit numbers.
5.1 *Solve problems involving multiplication of multi-digit numbers by two-digit numbers. *CA Addition
6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors.

4.NF: Number and Operations - Fractions
1. Equivalent fractions
2. Comparing fractions
3. Add and subtract fractions with like denominators (*introduce mixed numbers and improper fractions).
4. Multiply a fraction by a whole number.
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.
6. Use decimal notation for fractions with denominators 10 or 100.
7. Compare two decimals to hundredths by reasoning about their size.

4.MD: Measurement and Data
1-3. Solve problems involving measurement, and conversion of measurements, from a larger unit to a smaller unit *(time, measurement units, perimeter, area, etc.).*
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 from information in graph that involve adding/subtracting fractions.*
5-7. Geometric measurement - understand concepts of angle and measure angles.

4.G: Geometry
1-3. Draw and identify lines and angles; classify shapes by properties of their lines and angles (symmetry).

Unpacking the Common Core State Standards – 4th Grade
This link from the Public Schools of North Carolina State Board of Education will help teachers understand the standards and demonstrate the level of knowledge and skills students are expected to master. Please note that California additions to the CCSS are listed in the Standards Overview at each grade level.

Year-at-a-Glance: 4th Grade

September: UNIT 1	
Teach	• Exploring Place Value • Whole Number + and – • Rounding
Assess	Grade 3 Previous Grade Level Standards Checkpoints
Re-Teach	Grade 3 Previous Grade Level Standards as data shows

September: UNIT 2	
Teach	• Factors and multiples • Prime and composite numbers
Assess	Grade 3 Previous Grade Level and Unit 1 Standards Checkpoints
Re-Teach	Grade 3 Previous Grade Level and Unit 1 Standards as data shows

October: UNIT 3	
Teach	• Multiplication as Comparison • 4x1 and 2x2 digit multiplication
Assess	Grade 3 Previous Grade Level and Units 1-2 Standards Checkpoints
Re-Teach	Grade 3 Previous Grade Level and Units 1-2 Standards as data shows

October: UNIT 4	
Teach	Division: 4-digit dividends, 1-digit divisors
Assess	Grade 3 Previous Grade Level and Units 1-3 Standards Checkpoints
Re-Teach	Grade 3 Previous Grade Level and Units 1-3 Standards as data shows

November: UNIT 5	
Teach	• Relative size of measurement • Measurement word problems
Assess	Grade 3 Previous Grade Level and Units 1-4 Standards Checkpoints
Re-Teach	Grade 3 Previous Grade Level and Units 1-4 Standards as data shows

December: UNIT 6	
Teach	• Equivalent fractions • Comparing fractions • Fraction concepts
Assess	Grade 3 Previous Grade Level and Units 1-5 Standards Checkpoints
Re-Teach	Grade 3 Previous Grade Level and Units 1-5 Standards as data shows

Year-at-a-Glance: 4th Grade

January: UNIT 7		
Teach	• Decimal notation	• Intro of decimals as fractions
Assess	Grade 3 Previous Grade Level and Units 1-6 Standards Checkpoints	
Re-Teach	Grade 3 Previous Grade Level and Units 1-6 Standards as data shows	

January-February: UNIT 8		
Teach	• + and – fractions	• Fraction + and - word problems
Assess	Grade 3 Previous Grade Level and Units 1-7 Standards Checkpoints	
Re-Teach	Grade 3 Previous Grade Level and Units 1-7 Standards as data shows	

March: UNIT 9		
Teach	• Mult. of fraction and whole number	• Fraction mult. word problems
Assess	Grade 3 Previous Grade Level and Units 1-8 Standards Checkpoints	
Re-Teach	Grade 3 Previous Grade Level and Units 1-8 Standards as data shows	

March-April: UNIT 10		
Teach	• Display data in line plot	• Analyze and interpret data
Assess	Grade 3 Previous Grade Level and Units 1-9 Standards Checkpoints	
Re-Teach	Grade 3 Previous Grade Level and Units 1-9 Standards as data shows	

April-May: UNIT 11		
Teach	• Angle measurement concept	• Draw and identify lines
	• Discover unknown angles	• Symmetry
Assess	Grade 3 Previous Grade Level and Units 1-10 Standards Checkpoints	
Re-Teach	Grade 3 Previous Grade Level and Units 1-10 Standards as data shows	

May: UNIT 12	
Teach	Classify shapes by properties
Assess	Grade 3 Previous Grade Level and Units 1-11 Standards Checkpoints
Re-Teach	Grade 3 Previous Grade Level and Units 1-11 Standards as data shows

June	
Assess	Grade 3 Previous Grade Level and Units 1-12 Standards Checkpoints
Re-Teach	Grade 3 Previous Grade Level and Units 1-12 Standards as data shows

First Quarter: 4th Grade

September: UNIT 1

UNIT 1 OVERVIEW

Students generalize their understanding of place value to 1,000,000, comprehending the relative sizes of numbers in each place. Students apply their place value understanding to generate and analyze numerical or shape patterns. In later units, place value mastery will be necessary as students gain familiarity with factors, multiples, and prime and composite numbers.

KEY CONCEPTS	KEY TERMS
• Exploring place value • Rounding • Number patterns • Adding and subtracting whole numbers	• Place value • Algorithm • Round • Perimeter

UNIT STANDARDS

4.NBT.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 $700 \div 70 = 10$ by applying concepts of place value and division. *May want to intersect Practice Standard 4 with this standard.

4.NBT.2: 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. *May want to intersect Practice Standard 4 with this standard.

4.NBT.3: Use place value understanding to round multi-digit whole numbers to any place. *May want to intersect Practice Standard 8 with this standard.

4.NBT.4: Fluently add and subtract multi-digit whole numbers using the standard algorithm. *May want to intersect Practice Standard 6 with this standard.

4.MD.3: Apply the perimeter formula 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. *May want to intersect Practice Standards 1 and 4 with this standard.

4.OA.5: Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and 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. *May want to intersect Practice Standards 7 and 8 with this standard.

Unit 1 Map: 4th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

First Quarter: 4th Grade

September: UNIT 2

UNIT 2 OVERVIEW
Students gain familiarity with factors, multiples, prime and composite numbers. In later units, factors, multiples, prime, and composite number mastery will be necessary as students gain familiarity with methods to compute products of multi-digit whole numbers, developing fluency with efficient procedures for multiplying whole numbers, understanding and explaining why the procedures work based on place value and properties of operations, and using them to solve problems.

KEY CONCEPTS	KEY TERMS
• Factors and Multiples • Prime and Composite numbers	• Factor pairs • Multiples • Prime number • Composite number

UNIT STANDARDS
4.OA.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. *May want to intersect Practice Standard 6 with this standard.

Unit 2 Map: 4th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

First Quarter: 4th Grade

October: UNIT 3

UNIT 3 OVERVIEW
After gaining familiarity with prime and composite numbers and factors and multiples, students apply their understanding of models for multiplication (equal-sized groups, arrays, and 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.

KEY CONCEPTS		KEY TERMS
• Multi-digit multiplication • Unknowns in multiplication equations	• Equation • Multiplicative comparisons • Area models	• Rectangular arrays • Perimeter • Area

UNIT STANDARDS
4.OA.1: Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 x 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. *May want to intersect Practice Standard 2 with this standard.

4.OA.2: Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. *May want to intersect Practice Standards 1 and 4 with this standard.

4.NBT.5: Multiply a whole number of up to four digits by a one-digit whole number, and multiply two tow-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. *May want to intersect Practice Standards 2 and 4 with this standard.

4.MD.3: Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width or 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. *May want to intersect Practice Standards 1 and 4 with this standard.

Unit 3 Map: 4th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

First Quarter: 4th Grade

October: UNIT 4

UNIT 4 OVERVIEW

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.

KEY CONCEPTS	KEY TERMS	
• Whole number division • Unknowns in division equations	• Quotient • Remainder • Rectangular array • Estimate	• Dividend • Divisor • Area model • Mentally calculate

UNIT STANDARDS

4.NBT.6: Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. *May want to intersect Practice Standards 2 and 4 with this standard.

4.OA.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. *May want to intersect Practice Standards 1 and 4 with this standard.

Unit 4 Map: 4th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Second Quarter: 4th Grade

November: UNIT 5

UNIT 5 OVERVIEW
Students solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

KEY CONCEPTS	KEY TERMS	
• Measurement conversions • Elapsed time • Finding change	• Conversion • Elapsed time • Equivalent measurements • Table • Pound • Ounce • Liter • Milliliter	• Hour • Minute • Second • Kilogram • Kilometer • Meter • Centimeter • Gram

UNIT STANDARDS
4.MD.1: Know relative sizes of measurement units within one system of units including km, m, cm, kg, g, lb., oz., l, ml, hr., min, and 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), etc. *May want to intersect Practice Standard 7 with this standard.

4.MD.2: Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. *May want to intersect Practice Standards 1 and 4 with this standard.

Unit 5 Map: 4th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Second Quarter: 4th Grade

December: UNIT 6

UNIT 6 OVERVIEW
Students develop understanding of fractions and equivalence 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.

KEY CONCEPTS	KEY TERMS
• Fraction equivalence • Comparing fractions	• Visual fraction models • Equivalent fractions • Numerator • Denominator

UNIT STANDARDS
4.NF.1: Explain why a fraction a/b is equivalent to a fraction (n x a)(n x 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 fractions. *May want to intersect Practice Standards 2 and 4 with this standard.

4.NF.2: Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons of fractions with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. *May want to intersect Practice Standards 2 and 4 with this standard.

4.NF.5: Express a fraction with a 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. (Note: Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general, but addition and subtraction with unlike denominators in general is not a requirement at this grade.) *May want to intersect Practice Standards 2 and 4 with this standard.

Unit 6 Map: 4th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 4th Grade

January: UNIT 7

UNIT 7 OVERVIEW
Students understand decimal notation for fractions, and compare decimals and fractions.

KEY CONCEPTS	KEY TERMS
• Introduction of decimals as fractions with the denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. • Compare decimals	• Decimal notation • Tenth • Hundredth • Properties of operations

UNIT STANDARDS
4.NF.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. *May want to intersect Practice Standard 6 with this standard.

4.NF.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. *May want to intersect Practice Standards 2 and 4 with this standard.

Unit 7 Map: 4th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 4th Grade

January-February: UNIT 8

UNIT 8 OVERVIEW
Students develop understanding of operations with fractions. Students extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, and decomposing fractions into unit fractions.

KEY CONCEPTS	KEY TERMS
• Adding fractions and mixed numbers with like denominators. • Word problems: Adding and subtracting fractions with like denominators.	• Unit fraction • Decompose • Sum • Visual fraction models

UNIT STANDARDS
4.NF.3: Understand a fraction a/b with a > 1 as a sum of fractions 1/b. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. 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. 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. 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. *May want to intersect Practice Standards 1, 2, and 4 with this standard.

Unit 8 Map: 4th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 4ᵗʰ Grade

March: UNIT 9

UNIT 9 OVERVIEW
Students develop understanding of operations with fractions by using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number.

KEY CONCEPTS	KEY TERMS
• Multiplying a fraction by a whole number • Word problems: Multiplying a fraction by a whole number	• Multiple • Visual fraction models

UNIT STANDARDS
4.NF.4: Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. 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). 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.) 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? *May want to intersect Practice Standards 1, 2, and 4.

Unit 9 Map: 4th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 4ᵗʰ Grade

UNIT 10 OVERVIEW
Students represent and interpret data.

KEY CONCEPTS	KEY TERMS
• Measurement to the nearest , , and • Analyze and interpret data from line plots	• Line plot • Data • Points • Lines

UNIT STANDARDS
4.MD.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.* *May want to intersect Practice Standards 5 and 6.

Unit 10 Map: 4th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 4th Grade

April-May: UNIT 11

UNIT 11 OVERVIEW

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. Students understand that geometric figures can be analyzed and classified based on properties such as having parallel sides, perpendicular sides, particular angle measures, and symmetrical.

KEY CONCEPTS		KEY TERMS
• Explore lines and angles	• Angles (right, acute, obtuse)	• Protractor
• Understand symmetry	• Ray	• Sketch
	• Endpoint	• Non-overlapping parts
	• Angle measurement	• Line segments
	• Circular arc	• Perpendicular
	• Degree	• Parallel
	• Degrees in a circle	• Right triangle
		• Line of symmetry

UNIT STANDARDS

4.MD.5: Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: 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. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees. *May want to intersect Practice Standard 8.

4.MD.6: Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. *May want to intersect Practice Standards 5 and 6.

4.MD.7: Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle 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. *May want to intersect Practice Standards 1, 2, and 4.

4.G.1: Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. *May want to intersect Practice Standards 5 and 6.

4.G.3: Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry. *May want to intersect Practice Standards 2 and 4.

Unit 11 Map: 4th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 4th Grade

May: UNIT 12

UNIT 12 OVERVIEW
Students describe, analyze, compare, and classify two-dimensional shapes.

KEY CONCEPTS	KEY TERMS
• Classify shapes	• Angles (right, acute, obtuse) • Circular arc • Degree • Degrees in a circle • Protractor • Sketch • Line segments • Perpendicular • Parallel • Right triangle

UNIT STANDARDS
4.G.2: Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles. *May want to intersect Practice Standard 7.

Unit 12 Map: 4th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Grade Level Common Core Resources: 5th Grade

Standards Overview

Previous Grade Level Standards

- (4th) Count, read, write, compare, and round all multi-digit whole numbers
- (4th) Fluently add and subtract multi-digit whole numbers using the standard algorithm
- (2nd) Fluently add and subtract within 20
- (3rd) Fluently multiply and divide within 100
- (4th) Multiply up to four digits by a one-digit whole number, and multiply two two-digit numbers
- (4th) Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors
- (4th) Concept of fraction using a number line; equivalent fractions; comparing fractions; simplifying fractions
- (4th) Multiply a fraction by a whole number
- (4th) Use decimal notation for fractions with denominators 10 or 100
- (4th) Compare two decimals to hundredths by reasoning about their size
- (3rd) Measure and estimate length, volume, mass, and angles in standard units
- (3rd) Tell time to the nearest minute
- (4th) Solve word problems involving conversions (time, measurement, money)
- (3rd) Organize, represent, and interpret data using fraction scales (addition and subtraction of fractions)
- (4th) Geometry: area and perimeter, angles, lines, symmetry

5.OA: Operations and Algebraic Thinking

1. Order of operations - evaluate expressions using parenthesis, brackets, and braces
2. Write expressions from words
   *Express a whole number in the range 2-50 as a product of its prime factors
3. Analyze algebraic patterns and relationships (i.e. what is my rule?)
   *CA Addition

5.NBT: Number and Operations in Base Ten

1. Understand the value for any digit in whole numbers and decimals
2. Understand patterns in the placement and movement of the decimal point
3. Read, write, and compare decimals to thousandths
4. Use place value understanding to round decimals to any place
5. Fluently multiply multi-digit whole numbers using the standard algorithm
6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors
7. Add, subtract, multiply, and divide decimals to hundredths using concrete models, drawings, and strategies

5.NF: Number and Operations - Fractions

1. Add and subtract fractions with unlike denominators (including mixed numbers) using equivalent fractions
2. Solve word problems involving addition and subtraction of fractions
3. Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers
4. Multiply a fraction by a fraction or a whole number
5. Interpret multiplication as scaling (resizing)
6. Solve real-world problems involving multiplication of fractions and mixed numbers
7. Divide unit fractions by whole numbers and whole numbers by unit fractions

5.MD: Measurement and Data

1. Convert like measurement units within a given measurement
2. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems from information in graph that involve operations of fractions

3-5. Concept of volume, measurement of volume, apply formulas for volume, recognize volume as additive

5.G: Geometry

1-2. Graph points on the coordinate plane to solve real-world and mathematical problems.

3-4. Classify two-dimensional figures into categories based on their properties

5. * Know sum of the angles of any triangle is 180 and the sum of the angles of any quadrilateral is 360
6. *Derive and use the formula for the area of a triangle and parallelogram by comparing it with the formula for the area of a rectangle
   *CA Addition

Unpacking the Common Core State Standards – 5th Grade

This link from the Public Schools of North Carolina State Board of Education will help teachers understand the standards and demonstrate the level of knowledge and skills students are expected to master. Please note that California additions to the CCSS are listed in the Standards Overview at each grade level.

Year-at-a-Glance: 5th Grade

September: UNIT 1	
Teach	• Fluently multiply multi-digit numbers • Convert units (whole #s)
Assess	Grade 4 Previous Grade Level Standards Checkpoints
Re-Teach	Grade 4 Previous Grade Level Standards as data shows

October-November: UNIT 2	
Teach	• Read, write, compare, and round decimals
Assess	Grade 4 Previous Grade Level and Unit 1 Standards Checkpoints
Re-Teach	Grade 4 Previous Grade Level and Unit 1 Standards as data shows

November-December: UNIT 3	
Teach	• Perform all four operations with decimals to the hundredths • Convert units (decimals)
Assess	Grade 4 Previous Grade Level and Units 1-2 Standards Checkpoints
Re-Teach	Grade 4 Previous Grade Level and Units 1-2 Standards as data shows

January-February: UNIT 4	
Teach	• Add and subtract fractions • Word problems with fractions • Interpret a fraction as division of numerator by denominator • Represent and interpret data
Assess	Grade 4 Previous Grade Level and Units 1-3 Standards Checkpoints
Re-Teach	Grade 4 Previous Grade Level and Units 1-3 Standards as data shows

March: UNIT 5	
Teach	• Multiply fractions • Divide fractions
Assess	Grade 4 Previous Grade Level and Units 1-4 Standards Checkpoints
Re-Teach	Grade 4 Previous Grade Level and Units 1-4 Standards as data shows

April-May: UNIT 6	
Teach	• Order of operations • Write expressions from words • Algebraic expressions • Graphing on the coordinate plane
Assess	Grade 4 Previous Grade Level and Units 1-5 Standards Checkpoints
Re-Teach	Grade 4 Previous Grade Level and Units 1-5 Standards as data shows

April-May: UNIT 7	
Teach	• Measure volume • Solve real-world volume problems
Assess	Grade 4 Previous Grade Level and Units 1-5 Standards Checkpoints
Re-Teach	Grade 4 Previous Grade Level and Units 1-5 Standards as data shows

April-May: UNIT 8	
Teach	• Classify 2D figures in a hierarchy based on properties
Assess	Grade 4 Previous Grade Level and Units 1-5 Standards Checkpoints
Re-Teach	Grade 4 Previous Grade Level and Units 1-5 Standards as data shows

June	
Assess	Grade 4 Previous Grade Level and Units 1-6 Standards Checkpoints
Re-Teach	Grade 4 Previous Grade Level and Units 1-6 Standards as data shows

First Quarter: 5th Grade

September: UNIT 1

UNIT 1 OVERVIEW
Students 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 use multiplication and division understanding to convert units of measurement within a given measurement system.

KEY CONCEPTS	KEY TERMS
• Fluently multiply multi-digit numbers • Convert units within a given measurement system	• Algorithm • Fluency • Conversion

UNIT STANDARDS
5.NBT.5: Fluently multiply multi-digit whole numbers using the standard algorithm. *May want to intersect Practice Standards 6 and 8 with this standard.

5.MD.1: Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. *May want to intersect Practice Standards 1 and 7 with this standard.

Unit 1 Map: 5th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

First Quarter: 5th Grade

UNIT 2 OVERVIEW
Students read, write, and compare decimals to thousandths. Students use place value understanding to round decimals to any place.

KEY CONCEPTS	KEY TERMS
• Read decimals • Write decimals • Compare decimals • Round decimals	• Thousandths • Decimal point • Expanded form • Base-ten numerals • Round

UNIT STANDARDS
5.NBT.3: Read, write, and compare decimals to thousandths. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. *May want to intersect Practice Standards 2 and 8 with this standard.

5.NBT.4: Use place value understanding to round decimals to any place. *May want to intersect Practice Standard 7 with this standard.

Unit 2 Map: 5th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Second Quarter: 5th Grade

November-December: UNIT 3

UNIT 3 OVERVIEW

Students explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

KEY CONCEPTS	KEY TERMS
• Perform all four operations with decimals to the hundredths • Convert units (decimals)	• Powers of 10 • Decimal point • Equation • Dividend • Divisor • Conversion

UNIT STANDARDS

5.NBT.7: Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. *May want to intersect Practice Standards 2-4 with this standard.

5.NBT.2: Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. *May want to intersect Practice Standards 3 and 7 with this standard.

Unit 3 Map: 5th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 5th Grade

January-February: UNIT 4

UNIT 4 OVERVIEW

Students apply their understanding of fractions and fraction models to represent the addition and subtraction of fractions with unlike denominators as equivalent calculations with like denominators. They develop fluency in calculating sums and differences of fractions, and make reasonable estimates of them. Students can interpret a fraction as division of the numerator by the denominator and plot data on a line plot and analyze and interpret data.

KEY CONCEPTS	KEY TERMS	
• Add and subtract fractions • Interpret a fraction as division of the numerator by the denominator • Represent and interpret data	• Fraction models • Equivalent fractions • Benchmark fractions • Mixed numbers • Equivalent sum	• Equivalent difference • Denominator • Numerator • Data • Line plot

UNIT STANDARDS

5.NF.1: Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.). *May want to intersect Practice Standard 7 with this standard.

5.NF.2: Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result $2/5 + 1/2 = 3/7$, by observing that $3/7 < 1/2$. *May want to intersect Practice Standards 1 and 4 with this standard.

5.NF.3: Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie? *May want to intersect Practice Standards 1 and 2 with this standard.

5.MD.2: Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally. *May want to intersect Practice Standard 1 with this standard.

Unit 4 Map: 5th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 5th Grade

UNIT 5 OVERVIEW
Students use the meaning of fractions, of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for multiplying and dividing fractions make sense. (Note: this is limited to the case of dividing unit fractions by whole numbers and whole numbers by unit fractions.)

KEY CONCEPTS		KEY TERMS	
• Multiply fractions	• Product	• Rectangular areas	
• Divide fractions	• Area	• Factor	
	• Unit fraction	• Scaling (resizing)	
	• Unit squares		

UNIT STANDARDS
5.NF.4: Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts, equivalently, as the result of a sequence of operations $a \times q \div b$. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)* Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. *May want to intersect Practice Standards 4 and 7 with this standard.

5.NF.5: Interpret multiplication as scaling (resizing), by: Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number; explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number, and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1. *May want to intersect Practice Standards 2 and 4 with this standard.

5.NF.6: Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *May want to intersect Practice Standards 1 and 4 with this standard.

5.NF.7: Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$. Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb. of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins? *May want to intersect Practice Standards 1, 4, and 7 with this standard.

Unit 5 Map: 5th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 5th Grade

April-May: UNIT 6

UNIT 6 OVERVIEW
Students write, interpret, and evaluate numerical expressions (using decimals and whole numbers). Students analyze patterns and relationships as well as graph points on the coordinate plane to solve real-world and mathematical problems.

KEY CONCEPTS	KEY TERMS	
• Order of operations • Algebraic expressions • Graphing on the coordinate plane	• Order of operations • Parenthesis • Brackets • Braces • Evaluate • Interpret • Algebra • Algebraic expressions • Axes	• Coordinates (x and y) • Coordinate system • Perpendicular lines • X-axis • Y-axis • Origin • Quadrant • Ordered pairs

UNIT STANDARDS
5.OA.1: Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. *May want to intersect Practice Standards 6 and 8 with this standard.

5.OA.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product. *May want to intersect Practice Standard 8 with this standard.

5.G.1: Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate). *May want to intersect Practice Standard 6 with this standard.

5.G.2: Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. *May want to intersect Practice Standards 1 and 3 with this standard.

5.OA.3: Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so. *May want to intersect Practice Standards 2 and 7 with this standard.

Unit 6 Map: 5th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 5th Grade

UNIT 7 OVERVIEW

Students recognize volume as an attribute of three-dimensional space. They understand that volume can be measured by finding the total number of same-size units of volume required to fill the space without gaps or overlaps. They understand that a 1-unit by 1-unit by 1-unit cube is the standard unit for measuring volume. They select appropriate units, strategies, and tools for solving problems that involve estimating and measuring volume. They decompose three-dimensional shapes and find volumes of right rectangular prisms by viewing them as decomposed into layers of arrays of cubes. They measure necessary attributes of shapes in order to determine volumes to solve real world and mathematical problems.

KEY CONCEPTS	KEY TERMS
• Measure volume • Solve real-world volume problems	• Volume • Unit cube • Cubic inches (ft^3, cm^3, etc.) • Formula • Rectangular prism

UNIT STANDARDS

5.MD.3: Recognize volume as an attribute of solid figures and understand concepts of volume measurement. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. A solid figure, which can be packed without gaps or overlaps, using n unit cubes is said to have a volume of n cubic units. *May want to intersect Practice Standard 2 with this standard.

5.MD.4: Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft., and improvised units. *May want to intersect Practice Standards 5 and 6 with this standard.

5.MD.5: Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes (e.g., to represent the associative property of multiplication). Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems. *May want to intersect Practice Standards 1 and 4 with this standard.

Unit 7 Map: 5th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 5th Grade

April-May: UNIT 8

Students classify two-dimensional figures into categories based on their properties.

KEY CONCEPTS	KEY TERMS
● Classify two-dimensional figures in a hierarchy based on properties.	● Rectangular prism ● Hierarchy

UNIT STANDARDS

5.G.3: Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles. *May want to intersect Practice Standard 7 with this standard.

5.G.4: Classify two-dimensional figures in a hierarchy based on properties. *May want to intersect Practice Standard 7 with this standard.

Unit 8 Map: 5th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Grade Level Common Core Resources: 6ᵗʰ Grade

Standards Overview

Previous Grade Level Standards
- (5ᵗʰ) Count, read, write, and compare whole numbers and decimals to thousandths
- (5ᵗʰ) Round numbers to the hundredth
- (5ᵗʰ) Add, subtract, multiply, and divide decimals to hundredths
- (2ⁿᵈ) Fluently add and subtract within 20
- (3ʳᵈ) Fluently multiply and divide within 100
- (5ᵗʰ) Fluently multiply multi-digit whole numbers using the standard algorithm
- (5ᵗʰ) Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors
- (4ᵗʰ) Concept of fraction using a number line; equivalent fractions; comparing fractions
- (5ᵗʰ) Add and subtract fractions with unlike denominators (including mixed numbers) using equivalent fractions
- (5ᵗʰ) Multiply fractions
- (5ᵗʰ) Divide unit fractions by whole numbers and whole numbers by unit fractions
- (4ᵗʰ) Use decimal notation for fractions with denominators 10 or 100
- (3ʳᵈ) Measure and estimate length, volume, mass, and angles in standard units
- (5ᵗʰ) Algebraic Expressions - order of operations
- (5ᵗʰ) Convert like measurement units within a given measurement
- (3ʳᵈ) Organize, represent, and interpret data in scale applying fractions and their operations
- (5ᵗʰ) Geometry: area, perimeter, angles, lines, symmetry, coordinate graphing, and volume

6.RP: Ratios and Proportional Relationships
1. Concept of ratio
2. Concept of unit rate
3. Use ratio, rates, and percents to solve real-world and mathematical problems

6.NS: The Number System
1. Divide fractions by fractions
2. Fluently divide multi-digit numbers using the standard algorithm
3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm
4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12; distributive property (I.e. express $36 + 8$ as $4 (9 + 2)$)
5. Understand that positive and negative #s are used together to describe quantities having opposite directions or values
6. Understand a rational number as a point on the number line
7. Understand ordering and absolute value of rational numbers
   *Add and subtract rational numbers; represent addition and subtraction on a number line diagram.
8. Solve real-world and mathematical problems by graphing points in all 4 quadrants of the coordinate plane
   * CA Addition

6.EE: Expressions and Equations
1. Write and evaluate numerical expressions involving whole-number exponents
2. Write, read, and evaluate expressions in which letters stand for numbers
3. Apply the properties of operations to generate equivalent expressions.
4. Identify when two expressions are equivalent
5-8. Reason about and solve one-variable equations and inequalities

6.G: Geometry
1-4. Solve real-world and mathematical problems involving area, surface area, and volume
5. *Draw, construct, and describe geometrical figures and describe the relationships between them *CA Addition
6. *Know the formulas for the area and circumference of a circle *CA Addition

6.SP: Statistics and Probability
1-3. Develop understanding of statistical variability
4-5. Summarize and describe distributions

Unpacking the Common Core State Standards – 6th Grade

This link from the Public Schools of North Carolina State Board of Education will help teachers understand the standards and demonstrate the level of knowledge and skills students are expected to master. Please note that California additions to the CCSS are listed in the Standards Overview at each grade level.

Year-at-a-Glance: 6th Grade

September: UNIT 1		
Teach	• Fluently ÷ multi-digit numbers • Fluently +, -, x, ÷ decimals	• Explore GCF and LCM • Divide fractions
Assess	Grade 5 Previous Grade Level Standards Checkpoints	
Re-Teach	Grade 5 Previous Grade Level Standards as data shows	

October: UNIT 2		
Teach	• Order of operations with exponents • Expressions	• Applying properties of operations
Assess	Grade 5 Previous Grade Level and Unit 1 Standards Checkpoints	
Re-Teach	Grade 5 Previous Grade Level and Unit 1 Standards as data shows	

November: UNIT 3		
Teach	• Solving one-step equations and inequalities	• Variables representing numbers
Assess	Grade 5 Previous Grade Level and Units 1-2 Standards Checkpoints	
Re-Teach	Grade 5 Previous Grade Level and Units 1-2 Standards as data shows	

December: UNIT 4		
Teach	• Concept of ratio • Concept of unit rate	• Real-world ratio, rate, % problems
Assess	Grade 5 Previous Grade Level and Units 1-3 Standards Checkpoints	
Re-Teach	Grade 5 Previous Grade Level and Units 1-3 Standards as data shows	

January-February: UNIT 5		
Teach	• Introduction to rational numbers • Ordering and comparing rational numbers	• Absolute value • Coordinate graphing: 4 quadrants
Assess	Grade 5 Previous Grade Level and Units 1-4 Standards Checkpoints	
Re-Teach	Grade 5 Previous Grade Level and Units 1-4 Standards as data shows	

March: UNIT 6		
Teach	• Finding area • Volume	• Surface area • Modeling and drawing solids using nets
Assess	Grade 5 Previous Grade Level and Units 1-5 Standards Checkpoints	
Re-Teach	Grade 5 Previous Grade Level and Units 1-5 Standards as data shows	

April-May: UNIT 7		
Teach	• Summarize and describe data distributions • Develop understanding of statistical variability	• Explore the measures of central tendency (mean, median, range)
Assess	Grade 5 Previous Grade Level and Units 1-6 Standards Checkpoints	
Re-Teach	Grade 5 Previous Grade Level and Units 1-6 Standards as data shows	

June	
Assess	Grade 5 Previous Grade Level and Units 1-7 Standards Checkpoints
Re-Teach	Grade 5 Previous Grade Level and Units 1-7 Standards as data shows

First Quarter: 6th Grade

September: UNIT 1

UNIT 1 OVERVIEW

Students compute fluently with multi-digit numbers and find common factors and multiples. Students use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems.

KEY CONCEPTS	KEY TERMS	
• Fluently divide multi-digit numbers • Fluently add, subtract, multiply, and divide multi-digit decimals • Explore Greatest Common Factor (GCF) and Least Common Multiple (LCM) • Divide fractions	• Factor • Multiple • Distributive Property • Least Common Multiple	• Greatest Common Factor • Quotient • Equation • Fraction Models

UNIT STANDARDS

6.NS.2: Fluently divide multi-digit whole numbers using the standard algorithm. *May want to intersect Practice Standards 6 and 8 with this standard.

6.NS.3: Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. *May want to intersect Practice Standards 6 and 8 with this standard.

6.NS.4: Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4 (9 + 2). Apply and extend previous understandings of numbers to the system of rational numbers.* *May want to intersect Practice Standards 2 and 4 with this standard.

6.NS.1: Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi? Compute fluently with multi-digit numbers and find common factors and multiples.* *May want to intersect Practice Standards 1,3, and 4 with this standard.

Unit 1 Map: 6th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

First Quarter: 6th Grade

October: UNIT 2

UNIT 2 OVERVIEW
Students apply and extend previous understandings of arithmetic to algebraic expressions.

KEY CONCEPTS		KEY TERMS	
• Order of operations with exponents	• Equivalent	• Order of operations	
• Use variables to represent numbers	• Exponent	• Variable	
• Expressions	• Expression	• Evaluate	

UNIT STANDARDS
6.EE.1: Write and evaluate numerical expressions involving whole-number exponents. *May want to intersect Practice Standard 6 with this standard.

6.EE.2: Write, read, and evaluate expressions in which letters stand for numbers. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.* Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.* Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas $V = s^3$ and $A = 6 s^2$ to find the volume and surface area of a cube with sides of length s = 1/2.* *May want to intersect Practice Standards 2 and 6 with this standard.

6.EE.3: Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.* *May want to intersect Practice Standard 7 with this standard.

6.EE.4: Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for. Reason about and solve one-variable equations and inequalities.* *May want to intersect Practice Standard 3 with this standard.

Unit 2 Map: 6th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Second Quarter: 6th Grade

November: UNIT 3

UNIT 3 OVERVIEW
Students apply and extend previous understandings of arithmetic to algebraic expressions.

KEY CONCEPTS	KEY TERMS
• Reason about and solve one-variable equations and inequalities	• Equation • Inequality

UNIT STANDARDS

6.EE.5: Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

6.EE.6: Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

6.EE.7: Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.

6.EE.8: Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

Unit 3 Map: 6th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Re Think!
MATHEMATICS

Second Quarter: 6th Grade

December: UNIT 4

UNIT 4 OVERVIEW
Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates. Thus students expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide variety of problems involving ratios and rates. Students construct and analyze tables, such as tables of quantities that are in equivalent ratios.

KEY CONCEPTS	KEY TERMS	
• Exploring unit rates and ratios	• Unit rate	• Coordinate plane
	• Ratio	• Ordered pair
	• Equivalent ratios	• Percent
	• Tables	

UNIT STANDARDS
6.RP.1: Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."* *May want to intersect Practice Standards 2 and 3 with this standard.

6.RP.2: Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."* *May want to intersect Practice Standards 2 and 3 with this standard.

6.RP.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?* Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. *May want to intersect Practice Standards 1 and 4 with this standard.

Unit 4 Map: 6th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 6th Grade

UNIT 5 OVERVIEW

Students extend their previous understandings of numbers and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers, and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.

KEY CONCEPTS	KEY TERMS	
• Introduction to rational numbers • Ordering and comparing rational numbers • Absolute value • Coordinate graphing all four quadrants	• Integer • Positive • Negative • Opposite • Rational number • Absolute value	• Cartesian coordinate system • Coordinate plane • Quadrants • Ordered pair • X-axis • Y-axis

UNIT STANDARDS

6.NS.5: Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. *May want to intersect Practice Standards 2 and 3 with this standard.

6.NS.6: Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. *May want to intersect Practice Standards 2 and 4 with this standard.

6.NS.7: Understand ordering and absolute value of rational numbers. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret $-3 > -7$ as a statement that –3 is located to the right of –7 on a number line oriented from left to right.* Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write $-3\,^{o}C > -7\,^{o}C$ to express the fact that $-3\,^{o}C$ is warmer than $-7\,^{o}C$.* Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write $|-30| = 30$ to describe the size of the debt in dollars.* Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.* *May want to intersect Practice Standards 2 and 3 with this standard.

6.NS.8: Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. *May want to intersect Practice Standards 1 and 6 with this standard.

148

Unit 5 Map: 6th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 6th Grade

March: UNIT 6

UNIT 6 OVERVIEW
Students build on their work with area by reasoning about relationships among shapes to determine area, surface area, and volume. They find areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. Using these methods, students discuss, develop, and justify formulas for areas of triangles and parallelograms. Students find areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in Grade 7 by drawing polygons in the coordinate plane.

KEY CONCEPTS	KEY TERMS	
- Finding area - Volume - Surface area - Modeling and drawing solids using nets - Solving real world problems that focus on area, volume, and surface area	- Net - Polygon - Right rectangular prism	- Volume - Area - Surface area - Vertices

UNIT STANDARDS
6.G.1: Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. *May want to intersect Practice Standards 4 and 7 with this standard.

6.G.2: Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\,w\,h$ and $V = b\,h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. *May want to intersect Practice Standards 4 and 7 with this standard.

6.G.3: Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems. *May want to intersect Practice Standards 4 and 7 with this standard.

6.G.4: Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. *May want to intersect Practice Standards 4 and 7 with this standard.

Unit 6 Map: 6th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 6th Grade

April-May: UNIT 7

UNIT 7 OVERVIEW

Students use variables to represent two quantities in a real-world problem that change in relationship to one another to begin to develop their ability to think statistically. Students recognize that a data distribution may not have a definite center and that different ways to measure center yield different values. The median measures center in the sense that it is roughly the middle value. The mean measures center in the sense that it is the value that each data point would take on if the total of the data values were redistributed equally, and also in the sense that it is a balance point. Students recognize that a measure of variability (interquartile range or mean absolute deviation) can also be useful for summarizing data because two very different sets of data can have the same mean and median yet be distinguished by their variability. Students learn to describe and summarize numerical data sets, identify clusters, peaks, gaps, and symmetry, considering the context in which the data were collected.

KEY CONCEPTS		KEY TERMS	
• Summarize and describe data distributions • Develop understanding of statistical variability • Explore the measures of central tendency (mean and median and range)	• Function • Function table • Dependent variable • Independent variable • Statistics	• Data • Variability • Distribution • Median • Mean • Balance point	• Interquartile range • Absolute deviation • Box plots • Histograms • Dot plots

UNIT STANDARDS

6.EE.9: Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time. *May want to intersect Practice Standard 7 with this standard.

6.SP.1: Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.* *May want to intersect Practice Standard 2 with this standard.

6.SP.2: Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. *May want to intersect Practice Standard 2 with this standard.

6.SP.3: Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. *May want to intersect Practice Standard 2 with this standard.

6.SP.4: Display numerical data in plots on a number line, including dot plots, histograms, and box plots. *May want to intersect Practice Standards 5 and 6 with this standard.

6.SP.5: Summarize numerical data sets in relation to their context, such as by: Reporting the number of observations. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. *May want to intersect Practice Standards 7 and 8 with this standard.

Unit 7 Map: 6th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Grade Level Common Core Resources: 7th Grade

Standards Overview

Previous Grade Level Standards

- (6th) Count, read and write, compare, round whole numbers and decimals
- (3rd) Fluently add and subtract within 20; Fluently multiply and divide within 100
- (6th) Fluently divide multi-digit numbers using the standard algorithm.
- (5th) Fluently multiply multi-digit whole numbers using the standard algorithm
- (6th) Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm
- (4th) Concept of fraction and decimals using a number line; equivalent, comparing fractions and decimals
- (6th) Fluently add, subtract, multiply, and divide fractions
- (6th) Concept of ratio and unit rate
- (6th) Concept of Integers and rational numbers
- (6th) Write, read, and evaluate expressions with exponents
- (6th) Solve one-variable equations and inequalities
- (6th) Measure, estimate and convert measurements: length, volume, mass and angles in standard units
- (6th) Geometry: area, perimeter, angles, lines, symmetry, coordinate graphing, surface area and volume
- (6th) Develop understanding of statistical variability and summarize and describe distributions of data

7.RP: Ratios and Proportional Relationships

1. Compute unit rates
2. Recognize and represent proportional relationships between quantities
3. Use proportional relationships to solve multistep ratio and percent problems

7.NS: The Number System

1. Add and subtract rational numbers
2. Multiply and divide rational numbers
3. Solve real-world and mathematical problems involving the four operations with rational numbers
4. *Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
5. *Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., $\pi 2$).
   *CA Addition

7.EE: Expressions and Equations

1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients
2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."
3. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form
4. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems
5. *Use square root and cube root symbols. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
6. *Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.
   *CA Addition

7.G: Geometry

1. Scale Factors
2-3. Draw, construct and describe triangles
4. Area and circumference of circles
5. Missing angle measures
6. Solve real-life and mathematical problems involving surface area, and volume
7. *Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve problems.
   *CA Addition

7.SP: Statistics and Probability

1-2. Use random sampling to draw inferences about a population.
3-4. Draw informal comparative inferences about two populations
5-8. Investigate chance processes and develop, use, and evaluate probability models

Unpacking the Common Core State Standards – 7th Grade

This link from the Public Schools of North Carolina State Board of Education will help teachers understand the standards and demonstrate the level of knowledge and skills students are expected to master. Please note that California additions to the CCSS are listed in the Standards Overview at each grade level.

Year-at-a-Glance: 7th Grade

September-October: UNIT 1	
Teach	• Apply and extend understanding of operations with fractions to +, -, x, ÷ rational numbers
Assess	Grade 6 Previous Grade Level Standards Checkpoints
Re-Teach	Grade 6 Previous Grade Level Standards as data shows

November-December: UNIT 2		
Teach	• Use properties of operations to generate equivalent expressions and simplify algebraic equations and inequalities	• Solve real-world and mathematical problems using numerical and algebraic equations and inequalities
Assess	Grade 6 Previous Grade Level and Unit 1 Standards Checkpoints	
Re-Teach	Grade 6 Previous Grade Level and Unit 1 Standards as data shows	

January: UNIT 3	
Teach	• Analyze proportional relationships and use them to solve real-world problems
Assess	Grade 6 Previous Grade Level and Units 1-2 Standards Checkpoints
Re-Teach	Grade 6 Previous Grade Level and Units 1-2 Standards as data shows

February-March: UNIT 4		
Teach	• Area and circumference of a circle • Scale drawings	• Angle relationships formed by intersecting lines • Area, surface area, volume problems
Assess	Grade 6 Previous Grade Level and Units 1-3 Standards Checkpoints	
Re-Teach	Grade 6 Previous Grade Level and Units 1-3 Standards as data shows	

March-April: UNIT 5		
Teach	• Data analysis: using random sampling to draw inferences about a population	• Drawing informal comparative inferences about two populations
Assess	Grade 6 Previous Grade Level and Units 1-4 Standards Checkpoints	
Re-Teach	Grade 6 Previous Grade Level and Units 1-4 Standards as data shows	

April-May: UNIT 6		
Teach	• Probability • Investigate chance processes	• Develop, use, and evaluate probability models
Assess	Grade 6 Previous Grade Level and Units 1-5 Standards Checkpoints	
Re-Teach	Grade 6 Previous Grade Level and Units 1-5 Standards as data shows	

June	
Assess	Grade 6 Previous Grade Level and Units 1-6 Standards Checkpoints
Re-Teach	Grade 6 Previous Grade Level and Units 1-6 Standards as data shows

First Quarter: 7th Grade

September-October: UNIT 1

UNIT 1 OVERVIEW

Students apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers. They use number line models to support addition and subtraction operations. Students understand addition as the distance of the absolute value of the second number from the first (in the appropriate signed direction). They also understand subtraction as adding the additive inverse, and the distance between two rational numbers as the absolute value of their difference. Students interpret and apply all methods and principals in real-world contexts. Students fluently recall and apply the properties of operations as strategies while adding, subtracting, multiplying and dividing rational numbers.

KEY CONCEPTS	KEY TERMS	
• Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers	• Rational number • Integer • Negative • Positive • Product • Quotient • Sum • Difference	• Absolute value • Additive inverse • Multiplicative inverse • Distributive property • Associative property • Commutative property • Identity property

UNIT STANDARDS

7.NS.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.* Understand $p + q$ as the number located a distance $|q|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. Apply properties of operations as strategies to add and subtract rational numbers. *May want to intersect Practice Standards 1, 3, 6, and 7 with this standard.

7.NS.2: Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts. Apply properties of operations as strategies to multiply and divide rational numbers. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. *May want to intersect Practice Standards 1, 3, 6 and 7 with this standard.

7.NS.3: Solve real-world and mathematical problems involving the four operations with rational numbers. *May want to intersect Practice Standards 1, 3, and 4 with this standard.

Unit 1 Map: 7th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Second Quarter: 7th Grade

ReThink! MATHEMATICS

November-December: UNIT 2

UNIT 2 OVERVIEW

Students fluently recall and apply the properties of operations as strategies to generate equivalent expressions, choosing the most appropriate form to clearly model the situation, and reveal relationships between quantities. They apply the properties of operations to simplify algebraic equations and inequalities. Students write algebraic expressions, equations and inequalities to symbolize real-life situations or relationships. They solve algebraic equations and inequalities, using estimation and mental computation to assess accuracy and reasonableness of answer. Students Graph inequalities and interpret the solution in the context of the problem. Students fluently apply all operations on whole numbers, fractions and decimals, and move between the equivalent forms of a number.

KEY CONCEPTS	KEY TERMS	
- Use properties of operations to generate equivalent expressions, and simplify algebraic equations and inequalities - Solve real-life and mathematical problems using numerical and algebraic equations and inequalities	- Properties of operations - Distributive property - Associative property - Commutative property - Identity - Additive inverse - Multiplicative inverse - Solution	- Equation - Inequality - Addition property of equality - Multiplication property of equality - Coefficient - Variable - Like terms - Expression

UNIT STANDARDS

7.EE.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.* Understand $p + q$ as the number located a distance $|q|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. Apply properties of operations as strategies to add and subtract rational numbers. *May want to intersect Practice Standards 4 and 6 with this standard.

7.EE.2: Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts. Apply properties of operations as strategies to multiply and divide rational numbers. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. *May want to intersect Practice Standards 1, 2, and 4 with this standard.

7.EE.3: Solve real-world and mathematical problems involving the four operations with rational numbers. *May want to intersect Practice Standards 1 - 4 and 6 with this standard.

7.EE.4: Solve real-world and mathematical problems involving the four operations with rational numbers. *May want to intersect Practice Standards 1 - 4 with this standard.

Unit 2 Map: 7th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 7th Grade

January: UNIT 3

UNIT 3 OVERVIEW

Students compute unit rates whose comparison now includes fractions compared to fractions. The comparison can be with like or different units. Students identify the constant of proportionality by examining a variety of representations – tables, graphs, equations and verbal descriptions. Once the constant of proportionality is computed, students identify this as the unit rate, and may begin to extrapolate data. Using a table of data, students look for patterns by testing for equivalent ratios in the table. Students graph relationships to determine if two quantities are in a proportional relationship, visually, looking for a linear graph that intercepts the origin. Students interpret the ordered pairs in terms of the situation, including (0, 0) specifically and (1, r) and understand that r is the unit rate. Students can themselves begin to represent proportional relationships by equations, understanding that the coefficient is the unit rate (and constant of proportionality), and solve multi-step ratio using cross-multiplication, and percent problems such as: simple interest, tax, sale, discount, tips, percent increase and decrease.

KEY CONCEPTS	KEY TERMS	
• Analyze proportional relationships and use them to solve real-world and mathematical problems	• Distributive property • Associative property • Commutative property • Identity • Additive inverse • Multiplicative inverse • Addition property of equality • Proportion(al) • Ratio	• Equivalent ratio • Coefficient • Unit rate • Markup • Markdown • Percent increase • Percent decrease • Percent error • Tax • Tip

UNIT STANDARDS

7.RP.1: Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $^{1/2}/_{1/4}$ miles per hour, equivalently 2 miles per hour.* *May want to intersect Practice Standards 1, 4, and 6 with this standard.

7.RP.2: Recognize and represent proportional relationships between quantities. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate. *May want to intersect Practice Standards 1 - 4 with this standard.

7.RP.3: Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. *May want to intersect Practice Standards 1 and 2 with this standard.

Unit 3 Map: 7th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 7th Grade

February-March: UNIT 4

UNIT 4 OVERVIEW
Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.

KEY CONCEPTS		KEY TERMS	
• Area and circumference of a circle • Scale drawings • Angle relationships formed by intersecting lines • Real-life problems focusing on: Area, surface area, and volume	• Scale factor • Scale drawing • Dimensions • Plane sections • Right rectangular prism • Right rectangular pyramid • Parallel	• Inscribed • Isosceles • Obtuse • Plane • Radius • Pi • Diameter • Base • Circumference	• Perpendicular • Supplementary angle • Complementary angle • Adjacent angle • Vertical angle • Pyramid • Face

UNIT STANDARDS
7.G.1: Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. *May want to intersect Practice Standards 1 and 4 with this standard.

7.G.2: Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. *May want to intersect Practice Standards 4 and 5 with this standard.

7.G.3: Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. *May want to intersect Practice Standards 2 and 3 with this standard.

7.G.4: Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. *May want to intersect Practice Standards 1 - 3 with this standard.

7.G.5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure. *May want to intersect Practice Standards 1 - 3 with this standard.

7.G.6: Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. *May want to intersect Practice Standard 1 with this standard.

Unit 4 Map: 7th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 7th Grade

March-April: UNIT 5

UNIT 5 OVERVIEW
Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences.

KEY CONCEPTS	KEY TERMS	
• Data Analysis: Using random sampling to draw inferences about a population • Drawing informal comparative inferences about two populations	• Random sampling • Population • Sample • Inference • Representative sample	• Variation • Variability • Distribution • Measures of center • Measures of variability

UNIT STANDARDS
7.SP.1: Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. *May want to intersect Practice Standard 2 with this standard.

7.SP.2: Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be. *May want to intersect Practice Standard 7 with this standard.

7.SP.3: Informally assess the degree of visual overlap of two numerical data distributions with similar variability, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable. *May want to intersect Practice Standards 5 and 7 with this standard.

7.SP.4: Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*May want to intersect Practice Standards 5 and 7 with this standard.

Unit 5 Map: 7th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 7th Grade

April-May: UNIT 6

UNIT 6 OVERVIEW
Students understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Students develop probability models and use them to find probabilities of events. Students find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

KEY CONCEPTS	KEY TERMS	
• Probability • Investigate chance processes • Develop, use, and evaluate probability models	• Probability • Chance event • Likelihood • Theoretical probability • Experimental probability • Relative frequency • Prediction • Outcome	• Replicating • Probability model • Frequency • Compound events • Organized lists • Tables • Tree Diagrams • Simulation • Random digits

UNIT STANDARDS
7.SP.5: Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. *May want to intersect Practice Standard 2 with this standard.

7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.* *May want to intersect Practice Standards 7 – 8 with this standard.

7.SP.7: Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies? *May want to intersect Practice Standards 3, 4, and 7 with this standard.

7.SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space that compose the event. Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood? *May want to intersect Practice Standards 1, 4, and 5 with this standard.

Unit 6 Map: 7th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Grade Level Common Core Resources: 8ᵗʰ Grade

Standards Overview

Previous Grade Level Standards

(7ᵗʰ) Read, write, compare, round rational numbers

(2ⁿᵈ) Fluently add and subtract within 20

(3ʳᵈ) Fluently multiply and divide within 100

(7ᵗʰ) Fluently add, subtract, multiply, divide all rational numbers

(7ᵗʰ) Concept and solve ratio, unit rate, proportions and percent problems

(7ᵗʰ) Add, subtract, factor and expand linear expressions with rational coefficients

(7ᵗʰ) Reason and solve one-variable equations and inequalities

(3ʳᵈ) Measure and estimate length, volume and mass, angles in standard units

(5ᵗʰ) Convert like measurement units within a given measurement

(7ᵗʰ) Solve real-life and mathematical problems involving area, perimeter, angles, lines, symmetry, coordinate graphing, surface area and volume. Scale Factors, Area and circumference of circles

(7ᵗʰ) Draw, construct, and describe geometrical figures and describe the relationships between them

(7ᵗʰ) Use random sampling to draw inferences about a population.

(7ᵗʰ) Draw informal comparative inferences about two populations

(7ᵗʰ) Investigate chance processes and develop, use, and evaluate probability models

8.NS: The Number System

1. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number

2. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions

8.EE: Expressions and Equations

1-4. Work with radicals and integer exponents

5-6. Understand the connections between proportional relationships, lines, and linear equations

7. Solve linear equations in one variable

8. Analyze and solve pairs of simultaneous linear equations

8.F: Functions

1-3. Define, evaluate, and compare functions

4-5. Use functions to model relationships between quantities

8.G: Geometry

1-5. Understand congruence and similarity using physical models, transparencies, or geometry Software

6-8. Understand and apply the Pythagorean Theorem

9. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres

8.SP: Statistics and Probability

1-4. Investigate patterns of association in bi-variate data

Next Grade Level Algebra Standards

Perform arithmetic operations on polynomials

Quadratic equations; quadratic formula

Rational functions

Unpacking the Common Core State Standards – 8th Grade

This link from the Public Schools of North Carolina State Board of Education will help teachers understand the standards and demonstrate the level of knowledge and skills students are expected to master. Please note that California additions to the CCSS are listed in the Standards Overview at each grade level.

Year-at-a-Glance: 8th Grade

September: UNIT 1		
Teach	• Define, evaluate, graph, and compare fractions	• Use fractions to model and interpret relationships between quantities
Assess	Grade 7 Previous Grade Level Standards Checkpoints	
Re-Teach	Grade 7 Previous Grade Level Standards as data shows	

October: UNIT 2
Teach — Understand connections between lines, linear equations, and proportional relationships
Assess — Grade 7 Previous Grade Level and Unit 1 Standards Checkpoints
Re-Teach — Grade 7 Previous Grade Level and Unit 1 Standards as data shows

November: UNIT 3
Teach — Solve and understand applications of linear equations in 1 variable and systems of linear equations in 2 variables.
Assess — Grade 7 Previous Grade Level and Unit 1-2 Standards Checkpoints
Re-Teach — Grade 7 Previous Grade Level and Unit 1-2 Standards as data shows

November-December: UNIT 4	
Teach	• Laws of exponents • Perform operations with numbers expressed in scientific notation
Assess	Grade 7 Previous Grade Level and Units 1-3 Standards Checkpoints
Re-Teach	Grade 7 Previous Grade Level and Units 1-3 Standards as data shows

December-January: UNIT 5	
Teach	• Understand the meaning and application of irrational numbers • Compare size of irrational numbers with rational approximations
Assess	Grade 7 Previous Grade Level and Units 1-4 Standards Checkpoints
Re-Teach	Grade 7 Previous Grade Level and Units 1-4 Standards as data shows

January-February: UNIT 6		
Teach	• Translations • Rotations	• Dilations • Congruence and similarity
Assess	Grade 7 Previous Grade Level and Units 1-5 Standards Checkpoints	
Re-Teach	Grade 7 Previous Grade Level and Units 1-5 Standards as data shows	

February-March: UNIT 7		
Teach	• Angle sums	• Angle relationships
Assess	Grade 7 Previous Grade Level and Units 1-6 Standards Checkpoints	
Re-Teach	Grade 7 Previous Grade Level and Units 1-6 Standards as data shows	

March: UNIT 8
Teach — Understand and apply Pythagorean Theorem
Assess — Grade 7 Previous Grade Level and Units 1-7 Standards Checkpoints
Re-Teach — Grade 7 Previous Grade Level and Units 1-7 Standards as data shows

April: UNIT 9
Teach — Solve real-world problems with volume of 3D objects
Assess — Grade 7 Previous Grade Level and Units 1-8 Standards Checkpoints
Re-Teach — Grade 7 Previous Grade Level and Units 1-8 Standards as data shows

May: UNIT 10
Teach — Investigate patterns of association in bivariate data using scatter points
Assess — Grade 7 Previous Grade Level and Units 1-9 Standards Checkpoints
Re-Teach — Grade 7 Previous Grade Level and Units 1-9 Standards as data shows

June
Assess — Grade 7 Previous Grade Level and Units 1-10 Standards Checkpoints
Re-Teach — Grade 7 Previous Grade Level and Units 1-10 Standards as data shows

First Quarter: 8ᵗʰ Grade

September: UNIT 1

UNIT 1 OVERVIEW

Students will understand the definition of a function and will compare functions presented in different forms (graphs, tables, equations and word problems). Students will define linear functions and compare those to non-linear functions. Students will construct a function to model a linear relationship between two quantities, determining and interpreting the rate of change and initial value, given a graph, two points, a table of values, or a verbal description.

KEY CONCEPTS	KEY TERMS	
• Define, evaluate, graph and compare functions • Use functions to model and interpret relationships between quantities	• Function • Input • Output • Domain • Range • Independent axis	• Dependent axis • Rate of change • Initial value • Linear • Non-linear

UNIT STANDARDS

8.F.1: Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. *May want to intersect Practice Standard 2 with this standard.

8.F.2: Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change. *May want to intersect Practice Standards 1, 3, and 4 with this standard.

8.F.5: Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally. *May want to intersect Practice Standard 4 with this standard.

8.F.3: Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line. *May want to intersect Practice Standards 2 and 4 with this standard.

8.F.4: Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. *May want to intersect Practice Standards 1, 4, and 7 with this standard.

Unit 1 Map: 8th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

First Quarter: 8th Grade

UNIT 2 OVERVIEW
Students graph proportional relationships, interpreting the unit rate as the slope of the graph. Students compare two different proportional relationships represented in different ways *(i.e. a table vs. a graph)*. Students derive the equation y= mx + b from calculating the slope of a line in the coordinate plane and where the line crosses the y-axis.

KEY CONCEPTS	KEY TERMS	
• Understand connections between lines, linear equations, and proportional relationships	• Rate of change • Unit rate • Proportional relationship • Linear equation • Slope-intercept form • Standard form • Slope • y-intercept • x-intercept • Distributive property • Like terms • Coefficient	• Solution • Addition property of equality • Subtraction property of equality • Multiplication property of equality • Division property of equality • Inverse operations • Elimination method • Substitution method • Graphing method • $y = mx + b$ • $Ax + By = C$

UNIT STANDARDS
8.EE.5: Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed. *May want to intersect Practice Standards 1, 3, and 4 with this standard.

8.EE.6: Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b. *May want to intersect Practice Standards 2 and 7 with this standard.

Unit 2 Map: 8th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Second Quarter: 8th Grade

UNIT 3 OVERVIEW
Students graph proportional relationships, interpreting the unit rate as the slope of the graph. Students compare two different proportional relationships represented in different ways *(i.e. a table vs. a graph).* Students derive the equation y= mx + b from calculating the slope of a line in the coordinate plane and where the line crosses the y-axis.

KEY CONCEPTS	KEY TERMS	
• Solve and understand applications of linear equations in one variable and systems of linear equations in two variables.	• Rate of change • Unit rate • Proportional relationship • Linear equation • Slope-intercept form • Standard form • Slope • y-intercept • x-intercept • Distributive property	• Like terms • Coefficient • Solution • Addition property of equality • Subtraction property of equality • Multiplication property of equality	• Division property of equality • Inverse operations • Elimination method • Substitution method • Graphing method • $y = mx + b$ • $Ax + By = C$

UNIT STANDARDS
8.EE.7: Solve linear equations in one variable.

a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). *May want to intersect Practice Standards 6 – 8 with this standard.

b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. *May want to intersect Practice Standard 6 with this standard.

8.EE.8: Analyze and solve pairs of simultaneous linear equations.

a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. *May want to intersect Practice Standard 2 with this standard.

b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.* *May want to intersect Practice Standards 2 and 7 with this standard.

c. Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.* *May want to intersect Practice Standards 1 – 4 with this standard.

Unit 3 Map: 8th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Second Quarter: 8th Grade

UNIT 4 OVERVIEW
Students perform operations with radicals and integer exponents. Students Perform operations with numbers expressed in scientific notation.

KEY CONCEPTS	KEY TERMS	
• Laws of exponents • Perform operations with numbers expressed in scientific notation	• Scientific Notation • Negative exponent	• Power • Laws

UNIT STANDARDS

8.EE.1: Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $32 \times 3{-}5 = 3{-}3 = 1/33 = 1/27$. *May want to intersect Practice Standard 2 with this standard.

8.EE.2: Use square root and cube root symbols to represent solutions to equations of the form $x2 = p$ and $x3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational. *May want to intersect Practice Standard 4 with this standard.

8.EE.3: Use numbers expressed in the form of a single digit times a whole-number power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *May want to intersect Practice Standard 2 with this standard.

8.EE.4: Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology. *May want to intersect Practice Standards 5 and 6 with this standard.

Unit 4 Map: 8th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 8th Grade

December-January: UNIT 5

UNIT 5 OVERVIEW

Students understand the definition of rational and irrational numbers, and estimate or round their decimal expansions to given place values. Students use rational estimates of irrational numbers to compare the value of irrational numbers, have a method to find increasingly accurate approximations of irrational numbers, and locate these values on the number line. Students understand that commonly used constants in mathematics are often irrational numbers and estimate the value of expressions that have constants.

KEY CONCEPTS	KEY TERMS	
• Understand the meaning and application of irrational numbers • Compare size of irrational numbers with rational approximations	• Ratio • Rational • Irrational • Place Value • Constant • Square Root	• Cube root • Radical • Terminating decimal • Repeating Decimal

UNIT STANDARDS

8.NS.1: Understand informally that every number has a decimal expansion; the rational numbers are those with decimal expansions that terminate in 0s or eventually repeat. Know that other numbers are called irrational. *May want to intersect Practice Standards 2 and 4 with this standard.

8.NS.2: Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., $\pi 2$). *For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.* *May want to intersect Practice Standards 2 and 6 with this standard.

Unit 5 Map: 8th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 8th Grade

January-February: UNIT 6

UNIT 6 OVERVIEW

Students use ideas about distance and angles, how they behave under translations, rotations, reflections, and dilations, and ideas about congruence and similarity to describe and analyze two-dimensional figures and to solve problems.

KEY CONCEPTS	KEY TERMS	
• Translations • Rotations • Dilations • Congruence • Similarity	• Translations • Rotations • Reflections • Line of reflection • Center of rotation • Clockwise • Counterclockwise • Betweenness • Congruence	• Reading A' as "A prime" • Similarity • Dilations • Pre-image • Image • Rigid • Transformations • Scale factor

UNIT STANDARDS

8.G.1: Verify experimentally the properties of rotations, reflections, and translations:
  a. Lines are taken to lines, and line segments to line segments of the same length.
  b. Angles are taken to angles of the same measure.
  c. Parallel lines are taken to parallel lines. *May want to intersect Practice Standards 4 – 6 with this standard.

8.G.2: Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. *May want to intersect Practice Standards 2 and 7 with this standard.

8.G.3: Describe the effect of dilations, translations, rotations, and reflections on two- dimensional figures using coordinates. *May want to intersect Practice Standard 3 with this standard.

8.G.4: Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them. *May want to intersect Practice Standards 2 and 3 with this standard.

Unit 6 Map: 8th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Re Think
MATHEMATICS

Third Quarter: 8th Grade

UNIT 7 OVERVIEW
Students show that the sum of the angles in a triangle is the angle formed by a straight line, and that various configurations of lines give rise to similar triangles because of the angles created when a transversal cuts parallel lines.

KEY CONCEPTS	KEY TERMS	
• Angle sums • Angle relationships	• Exterior angles • Interior angles • Alternate interior angles • Angle-angle criterion • Deductive reasoning	• Vertical angles • Adjacent • Supplementary • Complementary • Corresponding • Parallel lines

UNIT STANDARDS
8.G.5: Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.* *May want to intersect Practice Standards 3 and 7 with this standard.

Unit 7 Map: 8th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Third Quarter: 8th Grade

March: UNIT 8

UNIT 8 OVERVIEW

Students understand the statement of the Pythagorean Theorem and its converse, and can explain why the Pythagorean Theorem holds, for example, by decomposing a square in two different ways. They apply the Pythagorean Theorem to find distances between points on the coordinate plane, to find lengths, and to analyze polygons.

KEY CONCEPTS	KEY TERMS	
• Understand and apply the Pythagorean Theorem	• Pythagorean Theorem • Pythagorean Triple • Right triangle	• Hypotenuse • Legs

UNIT STANDARDS

8.G.6: Explain a proof of the Pythagorean Theorem and its converse. *May want to intersect Practice Standards 3 and 7 with this standard.

8.G.7: Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. *May want to intersect Practice Standards 1 and 7 with this standard.

8.G.8: Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. *May want to intersect Practice Standards 6 and 7 with this standard.

Unit 8 Map: 8th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Fourth Quarter: 8th Grade

April: UNIT 9

UNIT 9 OVERVIEW

Students complete their work on volume by solving problems involving cones, cylinders, and spheres.

KEY CONCEPTS	KEY TERMS	
• Solve real world problems involving volume of cones, cylinders and spheres.	• Cones • Cylinders • Spheres • Radius	• Volume • Height • Pi

UNIT STANDARDS

8.G.9: Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. *May want to intersect Practice Standards 1 and 6 with this standard.

Unit 9 Map: 8th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Re Think!
MATHEMATICS

Fourth Quarter: 8th Grade

May: UNIT 10

UNIT 10 OVERVIEW
Students will construct and interpret scatter plots for bivariate measurement data. Students will be able to investigate patterns of association between two quantities and understand that linear models can be represented with a linear equation. Students will also construct and interpret a two-way table summarizing data on two categorical variables.

KEY CONCEPTS	KEY TERMS	
• Investigate patterns of association in bivariate data using scatter plots	• Bivariate data • Scatter plot • Linear model • Clustering • Linear association • Non-linear association	• Outliers • Positive association Negative association • Categorical data • Two-way table • Relative frequency

UNIT STANDARDS
8.SP.1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. *May want to intersect Practice Standards 7 and 8 with this standard.

8.SP.2: Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. *May want to intersect Practice Standards 2, 4, and 7 with this standard.

8.SP.3: Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr. as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height. *May want to intersect Practice Standard 1 with this standard.

8.SP.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores? *May want to intersect Practice Standards 2 – 4 with this standard.

Unit 10 Map: 8th Grade

ESSESNTIAL UNDERSTANDING/QUESTION OF UNIT:

UNIT SKILLS (DO):

UNIT ASSESSMENTS:

UNIT INSTRUCTIONAL STRATEGIES:

UNIT RESOURCES:

Grade Level Common Core Resources: Algebra

Standards Overview

Previous Grade Level Standards
- (7th) Read and write, compare, round rational numbers
- (2nd) Fluently add and subtract within 20
- (3rd) Fluently multiply and divide within 100
- (7th) Fluently add, subtract, multiply, divide all rational numbers
- (7th) Concept and solve ratio, unit rate, proportions and percent problems
- (7th) Add, subtract, factor and expand linear expressions with rational coefficients
- (7th) Reason and Solve one-variable equations and inequalities
- (3rd) Measure and estimate length, volume and mass, angles in standard units
- (5th) Convert like measurement units within a given measurement
- (7th) Solve problems involving area, perimeter, angles, lines, symmetry, 4 quadrant graphing, surface area volume
- (7th) Draw, construct, and describe geometrical figures and describe the relationships between them
- (7th) Statistics and Probability

N-RN: Number and Quantity: The Real Number System
- 1-2. Extend the properties of exponents to rational exponents
- 3. Use properties of rational and irrational numbers

N-Q: Number and Quantity: Quantities
- 2. Define appropriate quantities for the purpose of descriptive modeling

8-EE: Algebra: Expressions and Equations
- 1-4. Work with radicals and integer exponents
- 5-6. Understand the connections between proportional relationships, lines, and linear equations
- 7. Solve linear equations in one variable
- 8. Analyze and solve pairs of simultaneous linear equations

A-SSE: Algebra: Seeing Structures in Expressions
- 1-2. Interpret the structure of expressions
- 3. Write expressions in equivalent forms to solve problems

A-APR: Arithmetic with Polynomials and Rational Expressions
-     Perform arithmetic operations on polynomials

A-CED Algebra – Creating Equations
- 1-4. Create equations that describe numbers or relationships

A-REI Algebra - Reasoning with Equations and Inequalities
- 3-4. Solve equations and inequalities in one variable
- 6. Solve systems of equations
- 10. Represent and solve equations graphically
- 12. Represent and solve inequalities graphically

8.F: Functions
- 1-3. Define, evaluate, and compare functions
- 4-5. Use functions to model relationships between quantities

F-IF: Functions – Interpreting Functions
- 4-5. Interpret functions that arise in applications in terms of the context
- 7-8. Analyze functions using different representations

F-BF: Functions – Building Functions
- 1. Build a function that models a relationship between two quantities
- 3. Build new functions from existing functions

F-LE: Functions – Linear, Quadratic and Exponential Models
- 5. Interpret expressions for functions in terms of the situation they model

8.G: Geometry
- 1-5. Understand congruence and similarity using physical models, transparencies, or geometry software.
- 6-8. Understand and apply the Pythagorean Theorem
- 9. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres

8.SP: Statistics and Probability
- 1-4. Investigate patterns of association in bi-variate data

Unpacking the Common Core State Standards - Algebra

This link from the Public Schools of North Carolina State Board of Education will help teachers understand the standards and demonstrate the level of knowledge and skills students are expected to master. Please note that California additions to the CCSS are listed in the Standards Overview at each grade level.

First Quarter – Algebra

1st QUARTER

Reason quantitatively and use units to solve problems.

N.Q.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q.2 Define appropriate quantities for the purpose of descriptive modeling.

N.Q.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Interpret the structure of expressions.

A.SSE.1 Interpret expressions that represent a quantity in terms of its context.

a. Interpret parts of an expression, such as terms, factors, and coefficients.

b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)n as the product of P and a factor not depending on P.

Create equations that describe numbers or relationships.

A.CED.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A.CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods

A.CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance R.

Understand solving equations as a process of reasoning and explain the reasoning. **A.REI.1** Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

Solve equations and inequalities in one variable.

A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Linear and Exponential Relationships:

Extend the properties of exponents to rational exponents.

N.RN.1 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define 51/3 to be the cube root of 5 because we want (51/3)3 = 5(1/3)3 to hold, so (51/3)3 must equal 5.

N.RN.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.

Solve systems of equations.

A.REI.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

A.REI.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

Represent and solve equations and inequalities graphically.

A.REI.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

A.REI.11 Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

A.REI.12 Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Understand the concept of a function and use function notation.

F.IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.

F.IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

F.IF.3 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$.

Second Quarter – Algebra

2ND QUARTER:
Interpret functions that arise in applications in terms of a context.
F.IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where
the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
F.IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.
F.IF.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

Analyze functions using different representations.
F.IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
a. Graph linear and quadratic functions and show intercepts, maxima, and minima.
e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
F.IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.

Build a function that models a relationship between two quantities.
F.BF.1 Write a function that describes a relationship between two quantities.★
a. Determine an explicit expression, a recursive process, or steps for calculation from a context.
b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.

F.BF.2 Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.

Build new functions from existing functions.
F.BF.3 Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

Construct and compare linear, quadratic, and exponential models and solve problems.
F.LE.1 Distinguish between situations that can be modeled with linear functions and with exponential functions.
a. Prove that linear functions grow by equal differences over equal intervals; and that exponential functions grow by equal factors over equal intervals.
b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). **F.LE.3** Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
Interpret expressions for functions in terms of the situation they model. Limit exponential functions to those of the form f(x) = bx + k.
F.LE.5 Interpret the parameters in a linear or exponential function in terms of a context.

Descriptive Statistics
Summarize, represent, and interpret data on a single count or measurement variable. S.ID.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).
S.ID.2 Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

Third Quarter – Algebra

3RD QUARTER:
S.ID.3 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

Summarize, represent, and interpret data on two categorical and quantitative variables.
S.ID.5 Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.
S.ID.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.
b. Informally assess the fit of a function by plotting and analyzing residuals.
c. Fit a linear function for a scatter plot that suggests a linear association.
Interpret linear models.
S.ID.7 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
S.ID.8 Compute (using technology) and interpret the correlation coefficient of a linear fit.
S.ID.9 Distinguish between correlation and causation.

Expressions and Equations:
Interpret the structure of expressions.
A.SSE.1 Interpret expressions that represent a quantity in terms of its context.★
a. Interpret parts of an expression, such as terms, factors, and coef- ficients.
b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)n$ as the product of P and a factor not depending on P.
A.SSE.2 Use the structure of an expression to identify ways to rewrite it. For example, see $x4 – y4$ as $(x2)2 – (y2)2$, thus recognizing it as a difference of squares that can be factored as $(x2 – y2)(x2 + y2)$.

Write expressions in equivalent forms to solve problems.
A.SSE.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★
a. Factor a quadratic expression to reveal the zeros of the function it defines.
b. Complete the square in a quadratic expression to reveal the maxi- mum or minimum value of the function it defines.
c. Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be re- written as $(1.151/12)12t ≈ 1.01212t$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.

Perform arithmetic operations on polynomials.
A.APR.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
Create equations that describe numbers or relationships.
A.CED.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
A.CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance R.

Solve equations and inequalities in one variable.
A.REI.4 Solve quadratic equations in one variable.
a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x – p)2 = q$ that has the same solutions. Derive the quadratic formula from this form.
b. Solve quadratic equations by inspection (e.g., for $x2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a ± bi$ for real numbers a and b.

Solve systems of equations
A.REI.7 Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = –3x$ and the circle $x2 + y2 = 3$.

Fourth Quarter – Algebra

4TH QUARTER:

Quadratic Functions and Modeling:

Use properties of rational and irrational numbers.

N.RN.3 Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

Interpret functions that arise in applications in terms of a context.

F.IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★

F.IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★

F.IF.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

Analyze functions using different representations.

F.IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

a. Graph linear and quadratic functions and show intercepts, maxima, and minima.

b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

F.IF.8 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. **b**. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y = (1.02)t, y = (0.97)t, y = (1.01)12t, y = (1.2)t/10, and classify them as representing exponential growth or decay.

F.IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.

Build a function that models a relationship between two quantities.

F.BF.1 Write a function that describes a relationship between two quantities.★

a. Determine an explicit expression, a recursive process, or steps for calculation from a context. **b.** Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.

Build new functions from existing functions.

F.BF.3 Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

F.BF.4 Find inverse functions. **a.** Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) = 2 x3 or f(x) = (x+1)/(x-1) for x ≠ 1.

Construct and compare linear, quadratic, and exponential models and solve problems.

F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.

Appendix

Common Core State Standards in Mathematics Glossary

Common Core State Standards in Mathematics Table 1

Common Core State Standards in Mathematics Table 2

Common Core State Standards in Mathematics Table 3

Common Core State Standards in Mathematics Table 4

Common Core State Standards in Mathematics Table 5