Common Core State Standards & Long-Term Learning Targets
Math, Grade 5

Grade level	5
Discipline(s)	CCSS - Math
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"Fluency" is defined as accuracy, efficiency, and flexibility. (Russell, S. J. (2000). Developing computational fluency with whole numbers in the elementary grades. *The New England Math Journal, 32*(2), 40-54.)

Operations and Algebraic Thinking	**Long-Term Target(s)**
5.OA.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	I can communicate using mathematical symbols (parentheses, brackets, braces). I can evaluate expressions that involve parentheses, brackets, and/or braces.
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 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*	I can translate words into expressions. I can explain the relationship between numbers in an expression (without any calculations).
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.*	I can analyze patterns based on relationships and operations. I can create numeric patterns using given rules. I can graph ordered pairs on a coordinate plane.
Number and Operations in Base Ten	**Long-Term Target(s)**
5.NBT.1. 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.	I can explain the relationship between digits in different decimal places.
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.	I can explain the connection between the number of zeros in a number and the multiples of 10. I can explain the connection between the decimal point and multiplying/dividing by 10. I can use exponents to show powers of 10.

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 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (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.	I can read, write, and compare decimals to the thousandths place. I can explain decimals using base-ten numerals, number names, and expanded form. I can compare decimals using the symbols >, =, and <.
5.NBT.4. Use place value understanding to round decimals to any place.	I can round decimals to any given place.
5.NBT.5. Fluently multiply multi-digit whole numbers using the standard algorithm.	I can fluently multiply multi-digit whole numbers.
5.NBT.6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	I can explain the relationship between multiplication and division. I can find quotients using a variety of strategies. I can prove my calculations are correct using equations, rectangular arrays, and/or area models.
5.NBT.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	I can add, subtract, multiply, and divide decimals using a variety of strategies. I can explain the relationship between addition and subtraction. I can prove my calculations are correct using models. I can explain my reasoning and solutions to decimal problems in writing.
Number and Operations – Fractions	**Long-Term Target(s)**
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.)*	I can add and subtract fractions and mixed numbers with unlike denominators.
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	I can solve word problems involving addition and subtraction of fractions (with unlike denominators). I can represent the context of a fraction word problem using a variety of models.

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.*	I can use benchmark fractions and number sense to check for reasonable answers.
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?*	I can explain the relationship between fractions and division. I can solve word problems involving division and express my answers in fraction form. I can represent the context of a fraction word problem using a variety of models.
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.	I can multiply a whole number or fraction by a fraction. I can prove my product is correct using visual models. I can solve word problems involving multiplication by fractions. I can find the area of a rectangle (with fractional side lengths) using a variety of strategies.
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 (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in	I can compare the size of a product to the size of its factors (without performing multiplication). I can explain the result of multiplying a given number by a fraction greater than and less than 1.

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.	
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.	I can solve word problems involving multiplication by fractions and mixed numbers. I can represent the context of a fraction word problem using a variety of models.
5.NF.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.[1] – Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 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 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (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?* (Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.)	I can explain the relationship between multiplication, division, and fractions. I can represent the context of a word problem (involving division of fractions) using models and equations. I can solve word problems involving division of fractions using a variety of strategies.
Measurement and Data	**Long-Term Target(s)**
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	I can convert among units within one measurement system (metric, standard, time, etc.). I can solve measurement word problems involving

problems.	conversions. I can represent the context of the measurement word problem using a variety of models.
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.*	I can make a line plot to display a data set involving fractions of a measurement unit. I can use information from a line plot to solve problems.
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.	I can explain the concept of volume using unit cubes. I can explain the difference between the volumes of two- and three-dimensional (solid) figures.
5.MD.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	I can measure the volume of objects using a variety of methods and the appropriate units.
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.	I can explain the relationship between the concepts of volume, multiplication, and addition. I can solve real-word problems involving volume. I can represent the context of a volume problem using models.

Geometry	Long-Term Target(s)
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).	I can describe a coordinate system using correct vocabulary (axes, origin, points, plane, coordinates, quadrants).
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.	I can graph points on a coordinate plane. I can represent the context of a problem using a coordinate plane. I can explain the meaning of the graph within the context of a real-world problem.
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.	I can reason using the attributes and categories of geometric figures.
5.G.4. Classify two-dimensional figures in a hierarchy based on properties.	I can classify shapes based on properties.