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Operations & Algebraic Thinking	
Represent and solve problems involving multiplication and division. (3.OA.A) **3.OA.A.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.* **3.OA.A.2:** Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.* **3.OA.A.3:** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. **3.OA.A.4:** Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = □ ÷ 3, 6 × 6 = ?.*	▪ I can interpret products in multiplication (e.g., 50 = 5 ×10 can be interpreted as 5 groups of 10, an array with 5 rows of 10 columns, the area of a 5-by-10 rectangle, 5 rows of 10 objects). ▪ I can explain division as a set of objects partitioned into an equal nmber of shares. ▪ I can identify parts of division equations (dividend, divisor, and quotient). ▪ I can interpret quotients in division (e.g., 50/10 = 5 can be 5 groups with 10 items in each group or 10 groups with 5 items in each group.) ▪ I can determine when to multiply and divide in word problems. ▪ I can represent multiplication and division word problems using drawings, and equations with unknowns in all positions. ▪ I can solve word problems involving equal groups, arrays, and measurement quantities using drawings and equations. ▪ I can determine the unknown number in multiplication and division problems such as in the following examples: 8 × 9 = __ 8 ×__= 48 __ × 3 = 27 28 ÷ 7 = __ __ ÷ 6 = 3 35 ÷ __ = 5
Understand properties of multiplication and the relationship between multiplication and division. (3.OA.B)	

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3.OA.B.5): Apply properties of operations as strategies to multiply and divide.[1] *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56.* **3.OA.B.6:** Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*	▪ I can explain the commutative, associative, and distributive property of multiplication. ▪ I can apply the commutative, associative, and distributive properties to decompose, regroup, and/or reorder factors to make it easier to multiply two or more factors. ▪ I can explain how the operation properties can and cannot apply to division and use those properties that can apply to make it easier to find the quotient. ▪ I can explain the relationship between multiplication and division. ▪ I can turn a division problem into a multiplication problem with an unknown factor.
Multiply and divide within 100 (3.OA.C) **3.OA.C.7:** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	▪ I can multiply any two numbers with a product within 100 with ease by picking and using strategies that will get to the answer fairly quickly. ▪ I can divide whole numbers with a divisor within 100 and with a whole number quotient with ease by picking and using strategies that will get to the answer fairly quickly. ▪ I can instantly recall from memory the product of any two one-digit numbers.
Solve problems involving the four operations, and identify and explain patterns in arithmetic. (3.OA.D) **3.OA.D.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.	▪ I can choose the correct operation to perform the first computation, and choose the correct operation to perform the second computation in order to solve two-step word problems ▪ I can write equations using a letter for the unknown number. ▪ I can decide if my answers are reasonable using mental math and estimation strategies including rounding.

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3.OA.D.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.*	▪ I can identify and describe arithmetic patterns in number charts, addition tables, and multiplication tables. ▪ I can explain arithmetic patterns using properties of operations.
Numbers & Operations in Base Ten	
Use place value understanding and properties of operations to perform multi-digit arithmetic. (3.NBT.A) **3.NBT.A.1:** Use place value understanding to round whole numbers to the nearest 10 or 100. **3.NBT.A.2:** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. **3.NBT.A.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.	▪ I can round whole numbers to the nearest 10. ▪ I can round whole numbers to the nearest 100. ▪ I can add within 1000 with ease by using an algorithm or strategy based on place value (collecting the hundreds, collecting the tens, and collecting the ones, and when necessary, composing ten ones to make a ten or composing ten tens to make a hundred). ▪ I can subtract within 1000 with ease by using an algorithm or strategy based on place value (subtracting hundreds from hundreds, tens from tens, and ones from ones, and when necessary, decomposing a hundred into ten tens or decomposing a ten into ten ones). ▪ I can use other strategies (such as applying the commutative or associative property, adding on to solve a subtraction problem) for adding and subtracting within 1000 with ease. ▪ I can multiply one-digit numbers by 10. ▪ I can multiply one-digit numbers by multiples of 10 using strategies based on place value and operation properties (e.g,, 9 × 80 = 9 × (8 × 10); or 9 80 = (9 × 50) + (9 × 30)).
Number and Operations—Fractions	
Develop understanding of fractions as numbers. (3.NF.A)	▪ I can explain any unit fraction (1/b) as one part of a whole.

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3.NF.A.1: Understand a fraction 1/*b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction *a*/*b* as the quantity formed by a parts of size 1/*b*. **3.NF.A.2:** Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. 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. b. Represent a fraction *a*/*b* on a number line diagram by marking off a lengths 1/*b* from 0. Recognize that the resulting interval has size *a*/*b* and that its endpoint locates the number *a*/*b* on the number line. **3.NF.A.3:** Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. b. 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. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.* d. Compare two fractions with the same numerator or the same denominator by	▪ I can explain any fraction (a/b) as "a" (numerator) being the number of parts and "b' (denominator) as the total number of equal parts in the whole. ▪ I can explain and show hoe 1/b can be represented on a number line in two ways: (1) as a number that is located a distance of 1/b to the right of 0, and (2) as the size of each of the parts when a whole is portioned into b equal parts. ▪ I can explain and show how a/b can be represented on a number line in two ways: (1) as a number that is located a distance of a/b to the right of 0, and (2) as the size of a part when a whole is partitioned into b equal parts. ▪ I can represent a unit fraction (1/b) on a number line between 0 and 1. ▪ I can represent any fraction (a/b) on a number line. ▪ I can use models to show and explain equivalent fractions. ▪ I can locate equivalent fractions on a number line. ▪ I can use models to show and explain whole numbers as fractions. ▪ I can locate whole numbers as fractions on a number line. ▪ I can use models to compare two fractions and record the comparison using >, <, or =. ▪ I can explain how the size of equal parts can be used to compare two fractions with the same numerator, and explain how the number of equal parts, can be used to compare two fractions with the same denominator.

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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.	
Measurement & Data	
Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. (3.MD.A) **3.MD.A.1:** Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram. **3.MD.A.2:** Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).[2] 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.	▪ I can say and write time to the nearest minute. ▪ I can measure duration of time in minutes (e.g., basketball practice is 45 minutes long). ▪ I can solve addition and subtraction word problems involving durations of time measured in minutes. ▪ I can estimate liquid volumes and masses of objects using standard units of measure (grams, kilograms, and liters). ▪ I can measure liquid volumes and masses of objects using standard units of measure (grams, kilograms, and liters). ▪ I can use a drawing to represent one-step word problems involving masses or volumes. ▪ I can solve one-step word problems involving masses or volumes using addition, subtraction, multiplication, or division.
Represent and interpret data. (3.MD.B) **3.MD.B.3:** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*	▪ I can make a scaled picture graph or bar graph with several categories to represent data (e.g., one square or picture represents 5 objects). ▪ I can read and interpret scaled bar graphs in order to solve one- and two-step 'how many more" and 'how many less" problems.

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3.MD.B.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.	▪ I can use a ruler to measure lengths in whole, half, and quarter inches. ▪ I can gather and record measurement data using whole, half, and quarter inches. ▪ I can make a line plot with the horizontal scale marked off in whole number, half, or quarter units.
Geometric measurement: understand concepts of area and relate area to multiplication and to addition. (3.MD.C) **3.MD.C.5:** Recognize area as an attribute of plane figures and understand concepts of area measurement. a. 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. b. 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. **3.MD.C.6:** Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units). **3.MD.C.7:** Relate area to the operations of multiplication and addition. a. 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. b. 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. c. Use tiling to show in a concrete case that the area of a rectangle with whole-	▪ I can define a unit square. ▪ I can define area as the measure of a square with a plane figure and explain why area is measured in square units. ▪ I can measure the area of a shape or flat surface by covering it with unit squares – with no gaps or overlaps – and counting the number of unit squares used. ▪ I can use tiles to find the area of rectangles. ▪ I can explain the relationship between tiling and multiplying side length to find the area of rectangles. ▪ I can multiply adjacent side lengths of rectangles to solve word problems. ▪ I can use area models to explain he distributive property. ▪ I can decompose an irregular figure into non-overlapping rectangles. ▪ I can explain area as additive and use this understanding to solve word problems.

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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. d. 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.	
Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. (3.MD.D) **3.MD.D.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.	▪ I can identify polygons ▪ I can define perimeter ▪ I can find the perimeter of polygons when given the lengths of all sides. ▪ I can find unknown side lengths of polygons when given the perimeter. ▪ I can show how rectangles with the same perimeter can have different areas and show rectangles with the same area can have different perimeters. ▪ I can solve word problems involving perimeter.
Geometry	
Reason with shapes and their attributes. (3.G.A) **3.G.A.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. **3.G.A.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*	▪ I can use attributes to identify shapes. ▪ I can use attributes to classify shapes into categories. ▪ I can define quadrilaterals. ▪ I can recognize rhombuses, rectangles, and squares as being examples of quadrilaterals. ▪ I can draw quadrilaterals other than rhombuses, rectangles, and squares. ▪ I can partition (divide) shapes into equal parts with equal areas. ▪ I can explain any unit fraction (1/b) as one part of a whole divided into b equal parts (e.g., 1/2, 1/4, 1/8).

with equal area, and describe the area of each part as 1/4 of the area of the shape.	

The Standards for Mathematical Practice

The standards for mathematical practice are really about teaching students to think and act like mathematicians and problem solvers:

1. Make sense of problems and persevere in solving them.
   What it means: Understand the problem, find a way to attack it, and work until it is done. Basically, you will find practice standard #1 in every math problem, every day. The hardest part is pushing students to solve tough problems by applying what they already know and to monitor themselves when problem-solving.

2. Reason abstractly and quantitatively
   What it means: Get ready for the words *contextualize* and *decontextualize*. If students have a problem, they should be able to break it apart and show it symbolically, with pictures, or in any way other than the standard algorithm. Conversely, if students are working a problem, they should be able to apply the "math work" to the situation.

3. Construct viable arguments and critique the reasoning of others.
   What it means: Be able to talk about math, using mathematical language, to support or oppose the work of others.

4. Model with mathematics.
   What it means: Use math to solve real-world problems, organize data, and understand the world around you.

5. Use appropriate tools strategically.
   What it means: Students can select the appropriate math tool to use and use it correctly to solve problems. In the real world, no one tells you that it is time to use the meter stick instead of the protractor.

6. Attend to precision
   What it means: Students speak and solve mathematics with exactness and meticulousness.

7. Look for and make use of structure
   What it means: Find patterns and repeated reasoning that can help solve more complex problems. For young students this might be recognizing fact families, inverses, or the distributive property. As students get older, they can break apart problems and numbers into familiar relationships.

8. Look for and express regularity in repeated reasoning.

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What it means: Keep an eye on the big picture while working out the details of the problem. You don't want kids that can solve the one problem you've given them; you want students who can generalize their thinking.

To hear an explanation of the importance of these standards for mathematical practices, watch this video from the Hunt Institute:
https://www.youtube.com/watch?v=m1rxkW8ucAI&list=PLD7F4C7DE7CB3D2E6