

BALLSTON SPA CENTRAL SCHOOL DISTRICT
The Common Core State Standards in Our Schools

Fourth Grade Math

Standard	In school, I am learning to...
OPERATIONS AND ALGEBRAIC THINKING	
<i>Use the four operations with whole numbers to solve problems</i>	
<p>4.OA.1. Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ 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.</p> <p>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</p> <p>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.</p>	<ul style="list-style-type: none"> • Write/compose a multiplication equation. • Multiply two given numbers • Interpret a verbal comparison into an equation. • Change a number sentence into a word sentence. • Compare amounts using multiplication. (for example – 5 times as many7) • Translate (give an example of) verbal statements as multiplication statement • Solve word problems using multiplication(4 digits by 1 digit or 2 digits by 2 digit)s • Solve word problems using division(4 digit dividends by 1 digit divisor) • Identify variables, symbols, & unknown numbers. • Represent word problems and/or equations with pictures and symbols. • Compare amounts with multiplication. (for example – 7 times as many as7) *this is not repeated addition • Identify key words and relate words to operations • Compare amounts with addition (7 more than) • Identify x comparisons from additive comparisons • Add, subtract, multiply and divide with or without remainders • Identify key words to decide which operation(s) to use to solve a word problem. • Calculate long division with remainders. • Explain what a remainder is and how it will affect a given problem. • Write an equation to solve the word problem using a letter to represent the missing number. • Determine if an answer makes sense, based on the problem. • Justify my answers using mental math and estimation • Solve multistep word problems with whole numbers
<i>Gain familiarity with factors and multiples</i>	
<p>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.</p>	<ul style="list-style-type: none"> • Write all factor pairs for a whole number up to 100(ex. $56 = \underline{\quad} \times \underline{\quad}$) • Determine a whole number up to 100 by using factors. • Write a whole number for given factors (ex. $7 \times 6 = \underline{\quad}$) • Decide if a whole number (1-100) is a multiple of a given 1 digit number (For example – Is 56 a multiple of 7?) • Determine if a number(1-100) is prime or composite.

	<ul style="list-style-type: none"> Identify prime numbers and explain why they are prime. Identify composite numbers and explain why they are composite. Use divisibility rules to identify prime and composite numbers Define “multiple”
Generate and analyze patterns	
<p>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. <i>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.</i></p>	<ul style="list-style-type: none"> Use rules to explain a pattern. Create a number or shape pattern Create and explain a number or shape pattern. Identify a pattern within a pattern(ex. 1,4,7,10)
Standard	In school, I am learning to...
NUMBERS AND OPERATIONS IN BASE TEN	
Generalize place value understanding for multi-digit whole numbers	
<p>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. <i>For example, recognize that $700 \div 70 = 10$ by applying concepts of place value and division.</i></p> <p>4.NBT.2. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.</p> <p>4.NBT.3. Use place value understanding to round multi-digit whole numbers to any place.</p>	<ul style="list-style-type: none"> Identify place values up to 1,000,000. Use multiplication by a power of 10 to determine the value of a digit in a multi digit whole number. Define expanded form Define word form Define standard form Write and read a number in expanded form. Write and read a number in word form. Write and read a number in standard form. Compare numbers using $<$, $>$, $=$. Round numbers up to the millions place Explain why a number is rounded to a given place. Demonstrate understanding of place value using a drawing, chart, table, diagram, etc.
Use place value understanding and properties of operations to perform multi-digit arithmetic	
<p>4.NBT.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.</p> <p>4.NBT.5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</p>	<ul style="list-style-type: none"> Add numbers up to millions place value. Subtract numbers up to millions place value. Justify an answer by using the relationship between addition and subtraction(inverse operations). Apply the properties of operations to multiply numbers Multiply a 4 digit number by a 1 digit number Multiply 2, two digit numbers (ex. 23×45) Multiply numbers using written equations Illustrate and explain multiplication using rectangular arrays Illustrate and explain multiplication using area modules

<p>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.</p>	<ul style="list-style-type: none"> • Divide up to 4 digit number by a 1 digit divisor. • Apply the properties of operation to divide 4 digit numbers. • Apply strategies based on place value to divide up to 4 digit number by a 1 digit division • Explore different strategies for the division of 4 digit dividends and 1 digit divisors. • Illustrate and explain division with a rectangular array. • Illustrate and explain division with a model. • Illustrate and explain division with an equation.
Standard	In school, I am learning to...
NUMBERS & OPERATIONS - FRACTIONS	
<i>Extend understanding of fraction equivalence and ordering</i>	
<p>4.NF.1. Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.</p> <p>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 with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.</p>	<ul style="list-style-type: none"> • Identify equivalent fractions. • Create visual fraction models to show why fractions are equal. • Explain why two fractions are equivalent, but have different denominators. • Create equivalent fractions in number form (ie. $1/2 = 6/12$) by multiplying or dividing the numerator and denominator by the same number • Use multiples to find a LCD. • Compare fractions using symbols ($<$, $>$, $=$) • Compare two fractions with different numerators (like denominators). • Compare two unlike fractions by creating like denominators. • Compare a fraction to a benchmark fraction such as $1/2$, using a visual model. • Compare fractions to a benchmark fraction such as $1/2$, using numerical comparison. (ie. $3/6$ ____ $7/12$) • Explain that the size of the whole matters when comparing fractions (ie. $1/2$ of a medium pizza is not equal to $1/2$ of a large pizza). • Justify comparisons by using a visual fraction model. • Create a visual model to explain the comparison of fractions. • Compare two unlike fractions using crossmultiplication
<i>Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers</i>	
<p>4.NF.3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.</p> <p>a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.</p> <p>b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. <i>Examples:</i> $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.</p> <p>c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of</p>	<ul style="list-style-type: none"> • Explain that a fraction is a result of two other fractions added together. • Explain that a fraction is a result of two other fractions separated (subtracted). • Demonstrate that a fraction can be broken down into smaller parts that are added up to make the given fraction. • Justify that a mixed number is a whole number and a fraction by using a visual model. • Add or subtract mixed number with like denominators. • Change a mixed number into an improper fraction. • Change an improper fraction into a mixed number. • Add and subtract improper fractions with like denominators.

<p>operations and the relationship between addition and subtraction.</p> <p>d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.</p>	<ul style="list-style-type: none"> • Solve word problems using addition and subtraction of fractions with like denominators using visual models and equations. • Identify that a unit fraction has a numerator of 1.
<p>4.NF.4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</p> <p>a. Understand a fraction a/b as a multiple of $1/b$. <i>For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.</i></p> <p>b. Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number. <i>For example, use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$.)</i></p> <p>c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. <i>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?</i></p>	<ul style="list-style-type: none"> • Create a fraction from a whole number by placing the whole number over 1 (ie. $5 = 5/1$). • Multiply a whole number by a fraction by changing the whole number into a fraction (ie. $5 \times 3/4 = 5/1 \times 3/4$). • Use models to represent a fraction times a whole number. • Solve multiplication problems by multiplying the whole number by the numerator. • Solve multiplication word problems involving fractions and whole numbers using visual models. • Solve multiplication word problems involving fractions and whole numbers using equations.
Understand decimal notation for fractions, and compare decimal fractions	
<p>4.NF.5. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.² <i>For example, express $3/10$ as $30/100$, and add $3/10 + 4/100 = 34/100$.</i></p> <p>4.NF.6. Use decimal notation for fractions with denominators 10 or 100. <i>For example, rewrite 0.62 as $62/100$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.</i></p> <p>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.</p>	<ul style="list-style-type: none"> • Use base ten models to represent fractions. • Convert unlike denominators to like denominators (10,100) and add fractions. • Change a fraction with a denominator of 10 into a fraction with a denominator of 100 by multiplying the numerator and denominator by 10. • Write a fraction as a decimal to represent its place value. • Convert between decimals and fractions (ie. $0.62 = 62/100$). • Locate fractions and decimals on a number line (tenths and hundredths) • Compare two decimals to the hundredth place using a hundred grid and using symbols ($<$, $>$, $=$). • Recognize that in order to compare decimals, they must have the same place value • Create a model to justify an answer

Standard	In school, I am learning to...
MEASUREMENT AND DATA	
<i>Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit</i>	
<p>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, 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. <i>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),</i></p> <p>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.</p> <p>4.MD.3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. <i>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.</i></p>	<ul style="list-style-type: none"> • Identify and associate units of measurements used to measure length. • Identify and associate units of measurements used to measure capacity. • Identify and associate units of measurements used to measure weight. • Identify and associate units of measurements used to measure time. • Compare units of measurement within a given system (ie. 1 inch < 1 foot). • Convert (change) from a larger unit to a smaller unit. • Create a table to record equivalent measures. • Apply the four operations to solve word problems involving distance. • Apply the four operations to solve word problems involving elapsed time. • Apply the four operations to solve word problems involving liquid volume. • Apply the four operations to solve word problems involving mass. • Apply the four operations to solve word problems involving money. • Represent measurement quantities using diagrams with a measurement scale. • Calculate the area of a rectangle using the formula $A=L \times W$. • Calculate the perimeter of a rectangle using the formula $P=S+S+S+S$ or $P=2L+2W$ or $P=2L+2W$ • Apply the area and perimeter formula to solve real-world problems
<i>Represent and interpret data</i>	
<p>4.MD.4. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots. <i>For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.</i></p>	<ul style="list-style-type: none"> • Create a line plot to display (show) a data set that includes fractions or mixed numbers. • Add and subtract fractions using information from a line plot. • Answer questions about data measured on a line plot.
<i>Geometric measurement: Understand concepts of angle and measurement angle</i>	
<p>4.MD.5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:</p> <p>a. 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 $\frac{1}{360}$ of a circle is called a “one-degree angle,” and can be used to measure angles.</p> <p>b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.</p>	<ul style="list-style-type: none"> • Recognize that a circle has 360 degrees. • Explain that an angle measurement is a fraction of a circle. • Identify an angle • Recognize that angles are measured in degrees within a circle

<p>4.MD.6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.</p> <p>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.</p>	<ul style="list-style-type: none"> • Measure angles using a protractor. • Sketch angles of a given measurement (degree) using a protractor. • Identify benchmark angles (90°, 180°, 270°, 360°) • Decompose(separate) angles into smaller angles. • Add angle measures to make a larger angle. • Use addition and subtraction to find unknown angles.
Standard	In school, I am learning to...
GEOMETRY	
<i>Draw and identify lines and angles, and classify shapes by properties of their lines and angles</i>	
<p>4.G.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.</p> <p>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.</p> <p>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.</p>	<ul style="list-style-type: none"> • Draw points, lines, line segments, rays, angles, perpendicular, and parallel lines in two dimensional figures • Identify points, lines, line segments, rays, angles, perpendicular, and parallel lines in two dimensional figures. • Identify types of angles (right, acute, obtuse) • Identify two dimensional shapes that have parallel or perpendicular lines. • Identify two dimensional shapes that have angles of a specific size. • Recognize and label a right triangle. • Categorize two dimensional shapes by designated lines and angles. • Recognize and draw a line of symmetry. • Recognize and draw figures that have lines of symmetry.