

Common Core Math Curriculum – Grade 4

ESSENTIAL QUESTIONS	DOMAINS AND CLUSTERS	GRADE 4 SKILL	VOCABULARY	MATHEMATICAL PRACTICES	ASSESSMENT
<p>How can we use various strategies to solve a word problem?</p> <p>How are division and multiplications related to subtraction and addition?</p> <p>What patterns can we find in multiplication and division facts?</p> <p>How do you multiply a fraction by a whole number?</p>	<p><i>Operations and algebraic thinking</i> 4.OA.</p> <p>Use the four operations with whole numbers to solve problems.</p> <p>Gain familiarity with factors and multiples.</p> <p>Generate and analyze patterns.</p> <p><i>Number and Operations in Base Ten</i> 4.NBT</p> <p>Generalize place value understanding for multi-digit whole numbers.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Translate verbal statements involving multiplication to numeric equations (vice versa). 4.OA.1 <input type="checkbox"/> Explain the commutative property of multiplication. 4.OA.1 <input type="checkbox"/> Write factors of a given product. 4.OA.1 <input type="checkbox"/> Solve word problems for an unknown factor using multiplication or division (use a symbol for the unknown factor).4.OA.2 <input type="checkbox"/> Identify appropriate operations to solve word problems.4.OA.2 <input type="checkbox"/> Compare multiplication to repeated addition.4.OA.2 <input type="checkbox"/> Identify appropriate operations to solve word problems. 4.OA.3 <input type="checkbox"/> Solve multi-step word problems with whole numbers using all four operations. 4.OA.3 <input type="checkbox"/> Write an equation from a word problem using a letter to represent the unknown quantity. 4.OA.3 <input type="checkbox"/> Justify the reasonableness of solutions using estimation, mental computation, and rounding. 4.OA.3 <input type="checkbox"/> Interpret remainders in division word problems. 4.OA.3 <input type="checkbox"/> Identify all the factor pairs for a whole number in the range 1 - 100. 4.OA.4 <input type="checkbox"/> Explain the relationship between a whole number and its factors. 4.OA.4 <input type="checkbox"/> Determine if a whole number is a multiple of a given one digit number. 4.OA.4 <input type="checkbox"/> Determine if a whole number is prime or composite. 4.OA.4 <input type="checkbox"/> Generate a number or shape pattern that follows a given rule. 4.OA.5 <input type="checkbox"/> Draw conclusions regarding the features of the pattern not directly related to the rule. 4.OA.5 <input type="checkbox"/> Identify the pattern or rule for a given set of numbers or shapes. 4.OA.5 <input type="checkbox"/> Identify place value of a multi-digit whole number up to millions. 4.NBT.1 <input type="checkbox"/> Define a number in one place as 10 times its value in the place to its right. 4.NBT.1 <input type="checkbox"/> Read and write whole numbers in standard form, word form, and expanded form up to one million. 4.NBT.2 <input type="checkbox"/> Compare and order whole numbers using, <, >, = up to one million. 4.NBT.2 <input type="checkbox"/> Compare and order whole numbers based on the meaning of place value. 4.NBT.2 <input type="checkbox"/> Explain rules for rounding.4.NBT.3 <input type="checkbox"/> Round multi-digit whole numbers up to a million to any place value.4.NBT.3 	<ul style="list-style-type: none"> <input type="checkbox"/> numeric equations <input type="checkbox"/> multiplication <input type="checkbox"/> verbal statements <input type="checkbox"/> equations <input type="checkbox"/> commutative property <input type="checkbox"/> Divide <input type="checkbox"/> Multiply <input type="checkbox"/> Equations <input type="checkbox"/> unknown factor <input type="checkbox"/> repeated addition <input type="checkbox"/> Add <input type="checkbox"/> Subtract <input type="checkbox"/> Rounding <input type="checkbox"/> estimation <input type="checkbox"/> remainder <input type="checkbox"/> Prime <input type="checkbox"/> Composite <input type="checkbox"/> Factors <input type="checkbox"/> Multiples <input type="checkbox"/> Rule <input type="checkbox"/> Input <input type="checkbox"/> Output <input type="checkbox"/> Pattern <input type="checkbox"/> base ten <input type="checkbox"/> place value names <input type="checkbox"/> digit <input type="checkbox"/> Compare <input type="checkbox"/> greater than <input type="checkbox"/> less than <input type="checkbox"/> equal to <input type="checkbox"/> standard form 	<p>Make sense of problems and persevere in solving them.</p> <p>Reason abstractly and quantitatively.</p> <p>Construct viable arguments and critique the reasoning of others.</p> <p>Model with mathematics. place value blocks</p> <p>Uses appropriate tools strategically.</p> <ul style="list-style-type: none"> • Rulers • protractors • fraction • manipulatives • Geoboards • Place value blocks <p>Attend to precision</p>	<p>Word Problems</p> <p>Computation Problems</p> <p>Teacher Observation</p> <p>Anecdotal records</p> <p>Higher Order Questioning</p> <p>Open-ended questioning</p> <p>Performance-based tasks</p> <p>Pencil and paper</p> <p>Oral explanations</p>

<p>What are the factors of a number?</p> <p>How do you multiply whole numbers?</p> <p>How do you interpret remainders?</p> <p>How do you add and subtract fraction and decimals with money?</p> <p>How can we use estimation to check for the reasonability of addition, subtraction, multiplication and division solutions?</p>	<p>Use place value understanding and properties of operations to perform multi-digit arithmetic.</p> <p style="text-align: center;">Number and Operations Fractions 4.NF</p> <p>Extend understanding of fraction equivalence and ordering.</p> <p>Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.</p>	<ul style="list-style-type: none"> ❑ Add and subtract fluently within 1,000,000 (apply fluency with basic math facts in columns) 4.NBT.4 ❑ Multiply whole numbers up to 4-digit by 1-digit and 2-digit by 2-digit using place value strategies and properties of operations.4.NBT.5 ❑ Illustrate and explain multiplication calculations through equations, rectangular arrays, and/or area models.4.NBT.5 ❑ Divide whole numbers with up to 4-digit dividends and 1-digit divisors; quotients may contain remainders. 4.NBT6 ❑ Draw and explain calculations through equations, rectangular arrays, and/or area models. 4.NBT.6 ❑ Divide whole numbers using strategies based on place value, properties of operations, and the relationships between multiplication and division. 4.NBT.6 ❑ Calculate equivalent fractions. 4.NF.1 ❑ Draw a fraction model to identify equivalent fractions. 4.NF.1 ❑ Explain why multiplying a fraction by an equivalent form of 1 ($2/2$, $3/3$, etc) results in an equivalent fraction. 4.NF.1 ❑ Compare and order two fractions with unlike numerators and denominators by creating common denominators or common numerators. 4.NF.2 ❑ Compare and order two fractions with unlike numerators and denominators by comparing them to benchmark fractions. 4.NF.2 ❑ Explain that comparisons between two fractions are only valid when referring to the same whole. 4.NF.2 ❑ Record comparisons between fractions with less than, greater than, or equal to symbols. 4.NF.2 ❑ Justify comparison between two fractions using a visual fraction model. 4.NF.2 ❑ Explain adding fractions as joining parts of the same whole. 4.NF.3a ❑ Explain subtracting fractions as separating parts of the same whole. 4.NF.3a ❑ Rewrite a fraction into a sum of smaller fractions with the same denominator. 4.NF.3b ❑ Write each decomposition as an equation. 4.NF.3b ❑ Explain why rewriting a fraction is equivalent to the original fraction by using a visual fraction model. 4.NF.3b ❑ Add mixed numbers with like denominators using properties of operations, equivalent fractions, and the relationship between addition and subtraction. 4.NF.3c ❑ Subtract mixed numbers with like denominators using properties of operations, equivalent fractions, and the relationship between addition and subtraction. 4.NF.3c ❑ Convert mixed numbers to improper fractions to add and subtract fractions with like denominators. 4.NF.3c ❑ Identify the operation needed to solve a word problem. 4.NF.3d 	<ul style="list-style-type: none"> ▪ word form ▪ expanded form ▪ rounding ▪ standard algorithm ▪ Multiply ▪ properties of operations ▪ place value names ▪ equations ▪ rectangular arrays ▪ area models ▪ Divisor ▪ Remainder ▪ Quotient ▪ Dividend ▪ Operations ▪ Numerator ▪ Denominator ▪ Fraction ▪ Common denominator ▪ Common numerator ▪ Benchmark fractions ▪ Visual fraction model ▪ Greater than ▪ Less than ▪ Equal to ▪ Part ▪ Whole ▪ Fractions ▪ Addition ▪ Subtraction ▪ Sum ▪ Fraction 	<p>Look for and make use of structure.</p> <p>Look for and express regularity in repeated reasoning.</p> <p>http://mathleague.com/</p> <p>http://illuminations.nctm.org/</p> <p>http://www.exemplars.com</p> <p>http://www.edhelper.com/math_grade4.htm</p> <p>http://www.nctm.org/standards/focalpoints.aspx?id=332</p> <p>http://www.nctm.org/resources</p> <p>www.nysparents.com/nys/math</p>	<p>Math Portfolio</p> <p>Investigations</p> <p>Math Journal writing</p> <p>Peer assessment</p> <p>Teacher Observation</p> <p>Checklists</p> <p>Stenmark, J. K. (ed). (1991). <i>Mathematics Assessment: Myths, Models, Good Questions</i>. Reston, VA: NCTM</p> <p>http://palm.sri.com/</p> <p>http://teach-nology.com/web_tools/rubrics/math/</p>
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How do we use symbols to represent unknown quantities to solve word problems?	Understand decimal notation for fractions, and compare decimal fractions.	<ul style="list-style-type: none"> ❑ Solve word problems that involve addition and subtraction of fractions with like denominators referring to the same whole. 4.NF.3d ❑ Draw visual fraction models or create equations to representing word problems. 4.NF.3d ❑ Identify the relationship between repeated addition and multiplication. 4.NF.4a ❑ Generate multiples of the fraction $1/b$. 4.NF.4a ❑ Multiply a fraction by a whole number by decomposing the fraction as the numerator multiplied by the unit fraction of its denominator. 4.NF.4b ❑ Create a numeric expression from a word problem involving the multiplication of a whole number and a fraction. 4.NF.4c ❑ Solve word problems involving the multiplication of whole numbers and fractions. 4.NF.4c ❑ Identify between what two whole numbers the solution lies. 4.NF.4c 	<ul style="list-style-type: none"> ▪ Decomposition ▪ Visual fraction model ▪ equation ▪ Mixed number ▪ Improper fraction ▪ Equivalent ▪ Properties of operations ▪ Equation ▪ Whole ▪ Total ▪ Difference ▪ Unit fraction ▪ Multiple ▪ Multiply ▪ Product 			
How do fractions relate to other number concepts?		<ul style="list-style-type: none"> ❑ Convert fractions with a denominator of 10 to an equivalent fraction with a denominator of 100. 4.NF.5 ❑ Add two fractions with denominators of 10 and 100. 4.NF.5 ❑ Convert fractions with denominators of 10 and 100 to decimals. 4.NF.6 ❑ Locate decimals on a number line. 4.NF.6 ❑ Describe lengths in decimal form. 4.NF.6 ❑ Compare and order decimals to hundredths. 4.NF.7 ❑ Draw a visual model to reason about the size of decimals. 4.NF.7 ❑ Explain that comparisons between two decimals are only valid when referring to the same whole. 4.NF.7 ❑ Compare decimals using greater than, less than, and equal to symbols. 4.NF.7 	<ul style="list-style-type: none"> ▪ Numerator ▪ Denominator ▪ Equivalent fractions ▪ add ▪ Decimal ▪ Tenths ▪ Hundredths ▪ Number line ▪ Fraction ▪ Greater than ▪ Less than 			
How do we write fractions in simplest form?		Measurement and Data 4.MD	<ul style="list-style-type: none"> ❑ Order units of measurement within a given system. 4.MD.1 ❑ Convert larger units of measurement to smaller units of measurement within a given system. 4.MD.1 ❑ Construct a conversion table to record equivalent measurements of two units within a given system. 4.MD.1 ❑ Write measurement equivalents as a set of ordered pairs. 4.MD.1 ❑ Identify the operation(s) needed to solve a word problem. 4.MD.2 ❑ Solve word problems involving simple fractions and decimals. 4.MD.2 ❑ Solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money. 4.MD.2 ❑ Convert larger unit measurements to smaller unit measurements in order to solve word problems. 4.MD.2 ❑ Construct diagrams such as line diagrams to show conversions in measurement 4.MD.2 ❑ Calculate the area and perimeter for rectangles in word problems. 4.MD.3 	<ul style="list-style-type: none"> ▪ Units ▪ Equivalent ▪ Standard measurement units ▪ Conversion table ▪ Mass ▪ Volume ▪ Time intervals 		
What does a decimal represent?		Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.				
How do we read and write decimals?		Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.				
How do we add and subtract fractions and mixed numbers?						
How do we apply perimeter and area formulas?						

How do you know if a shape is symmetrical?	Represent and interpret data.	<ul style="list-style-type: none"> <input type="checkbox"/> Solve word problems involving finding the missing factor/side of an area problem. 4.MD.3 <input type="checkbox"/> Construct a line plot to display data of fractional measurements. 4.MD.4 <input type="checkbox"/> Compare data displayed in the line plot to solve addition and subtraction problems. 4.MD.4 <input type="checkbox"/> Identify the appropriate operation needed to solve a word problem. 4.MD.4 	<ul style="list-style-type: none"> ▪ Money ▪ Distance ▪ Fractions ▪ Decimals ▪ Operations ▪ Rectangle ▪ Perimeter ▪ Formula ▪ Area ▪ Width 		
How do you measure angles?	Geometric measurement: understand concepts of angle and measure angles.	<ul style="list-style-type: none"> <input type="checkbox"/> Measure angles with a protractor(half circle protractors and full circle protractors). 4.MD.5a <input type="checkbox"/> Define a “one degree angle” as an angle that turns 1/360 of a circle. 4.MD.5a <input type="checkbox"/> Define an angle measure as the fraction of the circular arc between two rays with a common endpoint. 4.MD.5a <input type="checkbox"/> Calculate n one-degree angles as having a measurement of n degrees. 4.MD.5b <input type="checkbox"/> Measure angles of n degrees. 4.MD.5b <input type="checkbox"/> Measure angles with whole number degrees using a protractor. 4.MD.6 <input type="checkbox"/> Sketch angles of a given measurement. 4.MD.6 <input type="checkbox"/> Define an angle measure as the sum of its non-overlapping parts. 4.MD.7 <input type="checkbox"/> Solve addition and subtraction problems to find the unknown angle in a diagram. 4.MD.7 <input type="checkbox"/> Create an algebraic expression in order to solve for a missing angle measure. 4.MD.7 <input type="checkbox"/> Identify the appropriate operation needed to solve a word problem. 4.MD.7 	<ul style="list-style-type: none"> ▪ Line plot ▪ Fractions 		
How do you find an unknown angle?	Geometric measurement: understand concepts of angle and measure angles.	<ul style="list-style-type: none"> <input type="checkbox"/> Calculate n one-degree angles as having a measurement of n degrees. 4.MD.5b <input type="checkbox"/> Measure angles of n degrees. 4.MD.5b <input type="checkbox"/> Measure angles with whole number degrees using a protractor. 4.MD.6 <input type="checkbox"/> Sketch angles of a given measurement. 4.MD.6 <input type="checkbox"/> Define an angle measure as the sum of its non-overlapping parts. 4.MD.7 <input type="checkbox"/> Solve addition and subtraction problems to find the unknown angle in a diagram. 4.MD.7 <input type="checkbox"/> Create an algebraic expression in order to solve for a missing angle measure. 4.MD.7 <input type="checkbox"/> Identify the appropriate operation needed to solve a word problem. 4.MD.7 	<ul style="list-style-type: none"> ▪ Angle ▪ Circular arc ▪ Points ▪ Rays ▪ Endpoints ▪ Degree ▪ Intersect ▪ “one degree angle” ▪ Protractor ▪ N degrees ▪ Straight 		
How do we correctly select which unit of measurement to used?	<p style="text-align: center;">Geometry 4G</p> <p>Draw and identify lines and angles, and classify shapes by properties of their lines and angles.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Draw points, lines, line segments, rays, angles (right, acute, obtuse), and parallel and perpendicular lines. 4.G.1 <input type="checkbox"/> Identify points, lines, line segments, rays, angles (right, acute, obtuse), and parallel and perpendicular lines in 2D figures. 4.G.1 <input type="checkbox"/> Classify angles as right, acute, or obtuse. 4.G.1 <input type="checkbox"/> Classify 2D figures based on the presence or absence of parallel or perpendicular lines. 4.G.2 <input type="checkbox"/> Classify 2D figures based on the presence or absence of specified angle measures. 4.G.2 <input type="checkbox"/> Define right triangles as their own category and identify right triangles in drawings. 4.G.2 <input type="checkbox"/> Define lines of symmetry as a line across a figure such that when the figure is folded on this line, both halves match up. 4.G.3 <input type="checkbox"/> Identify lines of symmetry in two-dimensional figures. 4.G.3 <input type="checkbox"/> Draw lines of symmetry on two-dimensional figures.4.G.3 	<ul style="list-style-type: none"> ▪ Obtuse ▪ Acute ▪ Right ▪ Vertex ▪ Equation ▪ Variable ▪ Angle ▪ Difference ▪ Total ▪ Right angle ▪ Right triangle 		
How do we draw and identify characteristics of two-dimensional figures?	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	<ul style="list-style-type: none"> <input type="checkbox"/> Draw points, lines, line segments, rays, angles (right, acute, obtuse), and parallel and perpendicular lines. 4.G.1 <input type="checkbox"/> Identify points, lines, line segments, rays, angles (right, acute, obtuse), and parallel and perpendicular lines in 2D figures. 4.G.1 <input type="checkbox"/> Classify angles as right, acute, or obtuse. 4.G.1 <input type="checkbox"/> Classify 2D figures based on the presence or absence of parallel or perpendicular lines. 4.G.2 <input type="checkbox"/> Classify 2D figures based on the presence or absence of specified angle measures. 4.G.2 <input type="checkbox"/> Define right triangles as their own category and identify right triangles in drawings. 4.G.2 <input type="checkbox"/> Define lines of symmetry as a line across a figure such that when the figure is folded on this line, both halves match up. 4.G.3 <input type="checkbox"/> Identify lines of symmetry in two-dimensional figures. 4.G.3 <input type="checkbox"/> Draw lines of symmetry on two-dimensional figures.4.G.3 	<ul style="list-style-type: none"> ▪ Obtuse ▪ Acute ▪ Right ▪ Vertex ▪ Equation ▪ Variable ▪ Angle ▪ Difference ▪ Total ▪ Right angle ▪ Right triangle 		
How do we classify two-dimensional shapes?	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	<ul style="list-style-type: none"> <input type="checkbox"/> Draw points, lines, line segments, rays, angles (right, acute, obtuse), and parallel and perpendicular lines. 4.G.1 <input type="checkbox"/> Identify points, lines, line segments, rays, angles (right, acute, obtuse), and parallel and perpendicular lines in 2D figures. 4.G.1 <input type="checkbox"/> Classify angles as right, acute, or obtuse. 4.G.1 <input type="checkbox"/> Classify 2D figures based on the presence or absence of parallel or perpendicular lines. 4.G.2 <input type="checkbox"/> Classify 2D figures based on the presence or absence of specified angle measures. 4.G.2 <input type="checkbox"/> Define right triangles as their own category and identify right triangles in drawings. 4.G.2 <input type="checkbox"/> Define lines of symmetry as a line across a figure such that when the figure is folded on this line, both halves match up. 4.G.3 <input type="checkbox"/> Identify lines of symmetry in two-dimensional figures. 4.G.3 <input type="checkbox"/> Draw lines of symmetry on two-dimensional figures.4.G.3 	<ul style="list-style-type: none"> ▪ Obtuse ▪ Acute ▪ Right ▪ Vertex ▪ Equation ▪ Variable ▪ Angle ▪ Difference ▪ Total ▪ Right angle ▪ Right triangle 		