Grade 4 - MATH
Skills Based Report Card

Geometry Skills and Expectations	Standards	Students will be able to…
Draws and identifies lines and angles	**4.G.A.1** Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	• Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
Classify shapes by their properties	**4.G.A.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. **4.G.A.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.	• 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. • 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.
Mathematical Practices Skills and Expectations	**Standards**	**Students will be able to…**
Makes sense of problems and persevere in solving them	**MP1** 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 analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions,	• Explain the meaning of a problem and look for entry points to its solution. • Analyze givens, constraints, relationships, and goals. • Make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. • Monitor and evaluate their progress and change course if necessary. • Explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends.

	tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches. **MP2** Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to *decontextualize*—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.	• Check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?”
Explains mathematical thinking and problem solving strategies	**MP4** Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. 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. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly	• Apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. • Make assumptions and approximations to simplify a complicated situation, realizing that these made need revision later. • Identify important quantities in a practical situation and map their relationships using tools as diagrams, two-way tables, graphs, flowcharts and formulas. • Analyze those relationships mathematically to draw conclusions. • Interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

	improving the model if it has not served its purpose.	
Masters basic math facts and applies them to basic computation and problem solving	**MP1** 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 analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches. **MP3** Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made	● Calculate accurately and efficiently express numerical answers with a degree of precision appropriate for the problem context. ● Consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. ● Give carefully formulated explanations to each other.

	formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments. **MP5** Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. 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, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts. **MP6** Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.	

Measurement and Data Skills and Expectations	Standards	Students will be able to…
Solves problems involving measurement	**4.MD.A.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. *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), …* **4.MD.A.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. **4.MD.A.3** Apply the area and perimeter formulas 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*.	● Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb., oz., l, ml; hr, min, sec. ● 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. ● Apply the area and perimeter formulas for rectangles in real world and mathematical problems.
Represents and interprets data	**4.MD.B.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*.	● Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, 1/8). ● Solve problems involving addition and subtraction of fractions by using information presented in line plots.
Understands geometric measurement	**4.MD.C.5.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 1/360 of a circle is called a "one-degree angle," and can be used to	● Recognize angles as geometric shapes that are formed wherever two rays share a common end-point, and understand concepts of angle measurement. ● Understand 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

	measure angles. **4.MD.C.5.B** An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees. **4.MD.C.6** Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. **4.MD.C.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.	points where the two rays intersect the circle. ● Understand and angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees. ● Recognize angle measure as additive. ● Understand 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.
Numbers and Operations Skills and Expectations	**Standards**	**Students will be able to…..**
Understands the place value system	**4.NBT.A.1** Recognize that in a multi-digit whole number, a digit in one place represents in the place to its right. For example, recognize that 700/70 = 10 by applying concepts of place value and division. **4.NBT.A.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. **4.NBT.A.3** Use place value understanding to round multi-digit whole numbers to any place.	● Recognize that in a multi-digit whole number, a digit in once place represents ten times what it represents in the place to its right. ● 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. ● Use place value understanding to round multi-digit whole numbers to any place.
Performs operations with multi-digit whole numbers and decimals	**4.NBT.B.4** Fluently add and subtract multi-digit whole numbers using the standard algorithm. **4.NBT.B.5** Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using	● Fluently add and subtract multi-digit whole numbers using the standard algorithm. ● 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.

	strategies based on place value and the properties of operations, illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	• Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. • 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.
Extends understanding of fraction equivalence and ordering	**4.NF.A.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 ans size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. **4.NF.A.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 ½. 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. **4.NF.C.7** Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.	• Explain why a fractions 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. • 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 ½. • 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. • Compare two decimals to hundredths by reasoning about their size. • Recognize that decimal comparisons are valid only when the two decimals refer to the same whole. • Record the results of decimal comparisons with the symbols >, =, or < and justify the conclusions, e.g., by using a visual model.
Builds fractions from unit fractions	**4.NF.B.3** Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. **4.NF.B.3B** 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+⅛=8/8+8/8+⅛.	• 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.

	4.NF.B.4.A 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 5X(¼), recording the conclusion by the equation 5/4=5X(¼). **4.NF.B.4.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. For example, use a visual fraction model to express 3x(⅖) as 6x(⅕), recognizing this product as 6/5. (In general, n x (a/b) = (n x a)/b.) **4.NF.B.4.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. For example,	• 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. • 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. • Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. • 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. • 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. • Use decimal notation for fractions with denominators 10 or 100.
Operations and Algebraic Thinking Skills and Expectations	**Standards**	**Students will be able to…**
Writes and interprets numerical expressions	**4.O.A.1** Interpret a multiplication equation as a comparison, e.g., interpret 35= 5x7 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. **4.O.A.A2** Multiply or divide to solve word problems including 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.	• Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5x7 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. • Multiply or divide to solve word problems involving multiplicative comparison. • Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must

	4.O.A.A3 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 strategies including rounding.	be interpreted. ● 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 a prime or composite.
Generates and analyzes patterns and relationships	**4.O.A.A3** 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 strategies including rounding. **4.O.A.B.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. **4.OA.C.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.	● Represent multistep, whole number word problems posed using equations with a letter standing for the unknown quantity. ● Assess the reasonableness of answers using mental computation and estimation strategies including rounding. ● 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.