Diocese of Phoenix Math Standards
Fourth Grade

Operations and Algebraic Thinking (OA) **Reason with shapes and their attributes. Use the four operations with whole numbers to solve problems**	
2021	**Standard**
4.OA.1	Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as equations.
4.OA.2	Multiply or divide to solve word problems involving multiplicative comparison. **DG4-S1-C2-DPO2** Represent the process of multiplication of whole numbers as repeated addition, using concrete or illustrative models. **DG4-S1-C2-DPO4** Represent the process of division of whole numbers as repeated subtraction, partitioning a group and partitioning a whole, using concrete or illustrative models. **DG4-S1-C2-DPO3** Regroup in subtraction to the millions place.
4.OA.3	Solve multistep word problems. □ 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. **DG4-S1-C2-PO3** Select the grade level appropriate operation to solve word problems. **DG4-S1-C2-PO4** Solve word problems using grade level appropriate operations and numbers. **DG4-S1-C3-PO1** Solve grade level appropriate problems using estimation. **DG4-S1-C3-PO1** Apply the appropriate strategy when calculating to solve problems. **DG4-S1-C3-PO2** Use estimation to verify the reasonableness of a calculation.

4.OA.3.1	Solve a variety of problems based on the multiplication principle of counting. □ Represent a variety of counting problems using arrays, charts, and systematic lists. □ Analyze relationships among representations and make connections to the multiplication principle of counting. **DG4-S1-C2-PO4** Solve word problems using grade-level appropriate operations and numbers. **DG4-S2-C3-PO1** Find all possible combinations when one item is selected from each of two sets containing up to three objects. **DG4-S2-C1-PO7** Solve contextual problems using graphs, charts, and tables.
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 if its factors. □ Determine whether a given whole number in the rang 1-100 is a multiple of a given one-digit number. □ Determine whether a given whole number in the range 1-100 is prime of composite. **DG4-S1-C1-PO18** Identify all whole number factors and pairs of factors for a given whole number through 144. **DG4-S1-C1-DPO10** State the factors for a given whole number. **DG4-S1-C1-PO19** Determine multiples of a given whole number with products through 144.
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. **DG4-S3-C1-DPO1** Describe a rule for a grade level appropriate iterative pattern, using symbols or numbers. **DG4-S3-C1-DP02** Use grade level appropriate mathematical terminology for patterns, algebra, and functions.

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Number and Operations in Base Ten (NBT) **Generalize place value understanding for multi-digit whole numbers**	
2021	**Standard**
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.
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. **DG4-S1-C1-PO1** Read whole numbers in contextual situations. **DG4-S1-C1-DPO1** Read and write whole numbers using real world situations of whole to the millions place, using whole numbers. **DG4-S1-C1-PO6** Apply expanded notation to model place value. **DG4-S1-C1-PO7** Compare two whole numbers. **DG4-S1-C1-DPO4** Compare and order using concrete and illustrated models of whole numbers to the millions place.
4.NBT.3	Use place value understanding to round multi-digit whole numbers to any place. **DG4-S1-C1-PO4** State place values for whole numbers. **DG4-S1-C1-PO5** Construct models to represent place value concepts for the ones, tens, hundreds and thousands places. **DG4-S1-C1-DPO2** Represent place value using concrete or illustrated models of round whole numbers to millions place.

4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm. **DG4-S1-C2-PO1** Add whole numbers. **DG4-S1-C2-DPO1** Regroup in addition to the millions place. **DG4-S1-C2-PO2** Subtract whole numbers. **DG4-S1-C2-DPO3** Regroup in subtraction to the millions place.
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. **DG4-S1-C2-PO5** Multiply multi digit numbers by two digit numbers. **DG4-S1-C2-PO7** State multiplication and division facts through 12s. **DG4-S1-C2-PO8** Demonstrate the associative property of multiplication. **DG4-S1-C2-PO9** Apply grade level appropriate properties to assist in computation.
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. □ The relationship between multiplication and division. □ Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. **DG4-S1-C2-PO6** Divide with one digit divisors. **DG4-S1-C2-DPO5** Divide with one digit divisors to find quotients with remainders. **DG4-S1-C2-PO7** State multiplication and division facts through 12s.

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Number and Operation - Fractions (NF) **Extend understanding of fraction equivalence and ordering. (Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100)**	
2021	**Standard**
4.NF.1	Explain why a fraction a/b is equivalent to a fraction (n x a)/(n x b) by using visual fraction models. Use this principle to recognize and generate equivalent fractions. **DG4-S1-C1-DPO5** Read and write fractions using real-world situations. **DG4-S1-C1-DPO7** Recognize fractions as division of the numerator by the denominator.
4.NF.2	Compare two fractions with different numerators and different denominators. □ 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. **DG4-S1-C1-PO12** Compare two unit fractions (e.g., 1⁄2 to 1/5) or proper or mixed numbers with like denominators. **DG4-S1-C1-DPO6** Compare and order fractions using concrete and illustrated models (e.g., halves, thirds, fourths, eighths) **DG4-S1-C1-PO13** Order three or more unit fractions or proper or improper fractions with like denominators. **DG4-S1-C2-DPO6** Simplify a fraction to lowest terms.
4.NF.3	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. □ Add and subtract mixed numbers with like denominators. □ Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators.

	DG4-S1-C1-PO9 Make models that represent mixed numbers. **DG4-S1-C1-PO10** Identify symbols, words, or models that represent mixed numbers. **DG4-S1-C1-PO11** Use mixed numbers in contextual situations. **DG4-S1-C1-PO12** Compare two unit fractions (e.g., 1⁄2 to 1/5) or proper or mixed numbers with like denominators.
4.NF.4	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. **DG6-S1-C2-PO8** Demonstrate the process of multiplication of proper fractions using models. **DG6-S1-C2-PO9** Multiply proper fractions.
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.
4.NF.6	Use decimal notation for fractions with denominators 10 or 100. **DG4-S1-C1-PO14** Use decimals in contextual situations. **DG4-S1-C1-DPO8** Read and write decimals using real-world situations of fractions (halves, thirds, fourths or eights).
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.

	DG4-S1-C1-PO15 Compare two decimals. **DG4-S1-C1-DPO9** Compare and order decimals using concrete and illustrated models. (thousandths) **DG4-S1-C1-PO16** Order three or more decimals.

Measurement and Data (MD) **Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit**	
2021	**Standard**
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. **DG4-S4-C4-DPO3** Measure length, volume and weight in both U.S. customary and metric units. **DG4-S4-C4-PO5** Compare units of measure to determine more or less relationships including: □ length - yards and miles, meters and kilometers. □ weight - pounds and tons, grams and kilograms.
4.MD.2	Use the four operations to solve: □ Word problems involving distances. □ Intervals of time. □ Liquid volume. □ Masses of objects. □ Money. □ Problems involving simple fractions or decimals. □ Problems that require expressing measurements given in a larger unit in terms of a smaller unit.

	DG4-S1-C2-PO4 Solve word problems using grade-level appropriate operations and numbers. **DG4-S4C4-PO2** Compute elapsed time using a clock (e.g., hours and minutes since or until...) or a calendar.
4.MD.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems. **DG4-S4-C4-DPO1** Identify a variety of shapes having the same perimeter and area. **DG4-S4-C4-DPO2** Solve problems using given formulas for simple area and perimeter. **DG4-S4-C4-PO9** Determine the area of squares and rectangles.
4.MD.4	Make a line plot to display a data set of measurements in fractions of a unit. Solve problems involving addition and subtraction of fractions by using information presented in line plots. **DG4-S2-C1-PO1** Formulate questions to collect data in contextual situations.
4.MD.5	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement. □ An angle is measured with reference to a circle with its center at the common endpoint of the rays. **DG4-S4-C1-PO4** Classify angles (e.g., right, acute, obtuse, straight).
4.MD.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. **DG6-S4-C4-PO2** Determine the appropriate tool needed to measure to the needed accuracy.
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.

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Geometry (G) **Draw and identify lines and angles, and classify shapes by properties of their lines and angles**	
2021	**Standard**
4.G.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. **DG4-S4-C1-PO3** Draw points, lines, line segments (open or closed endpoints), rays, or angles. **DG4-S4-C1-DPO2** Identify lines that are parallel and perpendicular.
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. **DG4-S4-C1-PO1** Identify the properties of 2-dimensional figures using appropriate terminology. **DG4-S4-C1-DPO1** Classify two-dimensional shapes and three-dimensional figures by their properties. **DG4-S4-C1-PO5** Classify triangles as right, acute, or obtuse.
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. **DG4-S4-C1-DPO3** Draw or build shapes that have symmetry and are congruent. **DG4-S4-C1-PO8** Draw a 2-dimensional shape that has line symmetry. **DG4-S4-C2-DPO2** Identify lines that are parallel and perpendicular.

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Computation **Solve problems involving addition, subtraction, multiplication and division of whole numbers and understand the relationship among these operations. They extend their use and understanding of whole numbers to the addition and subtraction of simple fractions and decimals.**	
2021	**Standard**
4.C.1	Understand and use standard algorithms for addition and subtraction.
4.C.2	Represent as multiplication any situation involving repeated addition.
4.C.3	Represent as division any situation involving the sharing of objects or the number of groups of shared objects.
4.C.4	Demonstrate mastery of the multiplication tables for the numbers between 0 and 12/
4.C.5	Use a standard algorithm to multiply numbers up to 100 by numbers up to 10, using relevant properties of the number system, with and without regrouping
4.C.6	Use a standard algorithm to divide numbers up to 100 by numbers up to 10, with and without a remainder, using relevant properties of the number system.
4.C.7	Understand the special properties of 0 and 1 in multiplication and division.

4.C.8	Add and subtract simple fractions with like denominators, using objects and pictures.
4.C.9	Add and subtract decimals (to hundredths), using objects and pictures.
4.C.10	Use a standard algorithm to add and subtract decimals (to hundredths).
4.C.11	Know and use strategies for estimating results of any whole number computations.
4.C.12	Use mental arithmetic to add or subtract numbers rounded to hundreds or thousands.