

Diocese of Phoenix Math Standards
Fifth Grade

Operations and Algebraic Thinking (OA) Write and interpret numerical expressions	
2021	Standard
5.OA.1	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. DG5-S1-C2-PO15 Simplify numerical expressions using the order of operations with grade-appropriate operations on number sets.
5.OA.2	Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.
5.OA.3	Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. DG4-S3-C1-DPO1 Describe a rule for a grade-level appropriate iterative pattern, using symbols or numbers. DG5-S3-C1-PO1 Communicate a grade-level appropriate iterative pattern, using symbols or numbers. DG5-S3-C1-PO2 Extend a grade-level appropriate iterative pattern. DG5-S3-C1-DPO1 Create simple geometric and number patterns and describe the rule.DG5-S3-C1-PO3 Solve grade-level appropriate iterative pattern problems.

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	Number and Operations in Base Ten (NBT) Understand the place value system
2021	Standard
5.NBT.1	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
5.NBT.2	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10. DG7-S1-C2-DPO2 Use mental math to multiply and divide decimals by powers of 10.
5.NBT.3	Read, write and compare decimals to thousandths. □ Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. □ Compare two decimals to thousandths based on meanings of the digits in each place, using >, = and < symbols to record the results of comparisons. DG4-S1-C1-PO15 Compare two decimals. DG4-S1-C1-DPO9 Compare and order decimals using concrete and illustrated models. (thousandths)
5.NBT.4	Use place value understanding to round decimals to any place.
5.NBT.5	Fluently multiply multi-digit whole numbers using the standard algorithm. DG4-S1-C2-PO5 Multiply multi-digit numbers by two-digit numbers.

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5.NBT.6	Find whole number quotients of whole numbers with up to four-digit dividends and two-digit divisors. ☐ Use strategies based on place value. ☐ Use the properties of operations. ☐ Use the relationship between multiplication and division. ☐ Illustrate and explain the calculation by using equations, arrays, and area models.
5.NBT.7	Add, subtract, multiply, and divide decimals to hundredths. ☐ Use concrete models or drawings. ☐ Use the properties of place value. ☐ Use the properties of operations. ☐ Use the relationship between multiplication and division. ☐ Relate the strategy to a written method and explain the reasoning used. DG5-S1-C2-PO12 Add or subtract decimals. DG5-S1-C2-PO13 Multiply decimals. DG5-S1-C2-PO14 Divide decimals “to hundredths place”.

Number and Operations - Fractions (NF) Use equivalent fractions as a strategy to add and subtract fractions	
2021	Standard
5.NF.1	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

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	DG5-S1-C2-DPO7 Add and subtract mixed fractions with unlike denominators. DG5-S1-C2-PO11 Add or subtract proper fractions and mixed numbers with like denominators with regrouping.
5.NF.2	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators. DG5-S1-C1-DPO2 Identify frequently used fraction, decimal and percent equivalents.
5.NF.3	Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers. DG4-S1-C1-DPO7 Recognize fractions as division of the numerator by the denominator.
5.NF.4	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. □ Interpret the product $(a/b) \times q$ as a part of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. □ Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. DG6-S1-C2-PO9 Multiply proper fractions. DG6-S1-C2-PO10 Multiply mixed numbers.
5.NF.5	Interpret multiplication as scaling (resizing) by: □ Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. □ Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number; explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number.

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5.NF.6	Solve real world problems involving multiplication of fractions and mixed numbers. DG6-S1-C2-PO9 Multiply proper fractions. DG6-S1-C2-PO10 Multiply mixed numbers. DG6-S1-C2-PO14 Solve problems involving fractions or decimals (including money) in contextual situations.
5.NF.7	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. □ Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. □ Interpret division of a whole number by a unit fraction, and compute such quotients. □ Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions

Measurement and Data (MD) Convert like measurement units within a given measurement system	
2021	Standard
5.MD.1	Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. DG5-S4-C4-PO4 Convert measurement units to equivalent units within a given system (U.S.customary and metric).
5.MD.2	Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots.

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5.MD.3	Recognize volume as an attribute of solid figures and understand concepts of volume measurement. □ A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume and can be used to measure volume. □ A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units. DG7-S4-C4-PO1 Identify the appropriate unit of measure for the volume of an object.
5.MD.4	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. DG5-S4-C4-DPO5 Develop strategies to determine the surface area and volume of rectangular solids.
5.MD.5	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. □ Find the volume of a right rectangular prism with whole number side lengths by packing it with unit cubes. □ Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems. □ Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems. DG5-S4-C4-DPO4 Measure length, volume, weight, and temperature in both U.S. customary and metric units.

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Geometry (G) Graph points on the coordinate plane to solve real-world and mathematical problems	
2021	Standard
5.G.1	Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y- axis and y-coordinate). DG5-S4-C4-PO1 State an appropriate measure of accuracy for a contextual situation
5.G.2	Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. DG5-S4-C3-PO1 Graph points in the first quadrant on a grid using ordered pairs.
5.G.3	Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles. DG5-S4-C1-PO2 Draw 2-dimensional figures by applying significant properties of each (e.g., Draw a quadrilateral with two sets of parallel sides and four right angles). DG5-S4-C1-PO4 Identify the properties of 2- and 3-dimensional geometric figures using appropriate terminology and vocabulary. (parallelism, perpendicularity, congruency, similarity). DG5-S4-C1-PO13 Identify the lines of symmetry in a 2-dimensional shape.DG5-S4-C1-DPO3 Draw or build a shape that has symmetry. DG5-S4-C1-DPO4 Use grade-level appropriate mathematical terminology for geometry and measurement.

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5.G.4	Classify two-dimensional figures in a hierarchy based on properties. DG5-S4-C1-PO5 Draw points, lines, line segments, rays, and angles with appropriate labels. DG5-S4-C1-PO6 Recognize that all pairs of vertical angles are congruent. DG5-S4-C1-PO7 Classify triangles as scalene, isosceles, or equilateral. DG5-S4-C1-PO11 Draw two congruent geometric figures. DG5-S4-C1-DPO2 Distinguish shapes that are congruent.
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Computation Students solve problems involving multiplication and division of whole numbers and solve problems involving addition, subtraction and simple multiplication and division of fractions and decimals	
2021	Standard
5.C.1	Solve problems involving multiplication and division of any whole numbers.
5.C.2	Add, subtract, multiply, compare and order positive and negative integers (e.g on a number line).
5.C.3	Add and subtract fractions, including mixed numbers, with different denominators.

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5.C.4	Use models to show an understanding of multiplication and division of fractions.
5.C.5	Multiply and divide fractions to solve problems.
5.C.6	Add and subtract decimals with or without money and decimal notation, verifying the reasonableness of the results.
5.C.7	Use estimation to decide whether answers are reasonable in addition, subtraction, multiplication and division problems.
5.C.8	Use mental arithmetic to add or subtract simple decimals.
5.C.9	Multiply and divide decimals by a whole number.
5.C.10	Use the order of operations to solve numerical equations and expressions.