# Diocese of Phoenix Math Standards
## Third Grade

| Operations and Algebraic Thinking (OA) | |
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| **Represent and solve problems involving multiplication and division** | |
| **2021** | **Standard** |
| 3.OA.1 | Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.<br><br>**DG3-S1-C2-PO7** Demonstrate the process of multiplication as repeatedly adding the same number, counting by multiples, combining equal sets, and making arrays. |
| 3.OA.2 | Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.<br><br>**DG3-S1-C2-PO8** Demonstrate the process of division with one-digit divisors (separating elements of a set into smaller equal sets, sharing equally, or repeatedly subtracting the same number). |
| 3.OA.3 | Use multiplication and division within 144 to solve word problems in situations involving:<br>□ equal groups<br>□ arrays<br>□ measurement quantities<br><br>**DG3-S1-C2-PO6** (word problem) Solve word problems using grade-level appropriate operations and numbers.<br><br>**DG3-S1-C2-PO7** (through 12) Demonstrate the process of multiplication as repeatedly adding the same number, counting by multiples, combining equal sets, and making arrays.<br><br>**DG3-S1-C2-P10** (through 9) State multiplication and division facts through 12s. |

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| 3.OA.4 | Determine the unknown whole number in a multiplication or division equation relating three whole numbers.<br><br>**DG-3S3-C3-DPO1**-Find missing number in adding, subtracting, multiplying, dividing number sentences. |
| 3.OA.5 | Apply properties of operations as strategies to multiply and divide.<br><br>**DG3-S1-C2-PO11** Demonstrate the commutative and identity properties of multiplication.<br><br>**DG3-S1-C2-PO13** Apply grade-level appropriate properties to assist in computation.<br><br>**DG4-S1-C2-PO8** Demonstrate the associative property of multiplication.<br><br>**DG5-S1-C2-PO5** Demonstrate the distributive property of multiplication over addition. |
| 3.OA.6 | Understand division as an unknown-factor problem.<br><br>**DG3-S1-C2-PO12** Identify multiplication and division as inverse operations. |
| 3.OA.7 | Fluently multiply and divide within 144, using strategies such as the relationship between multiplication and division.<br><br>**DG3-S-PO10** State multiplication and division facts through 12s. |
| 3.OA.8 | Solve two-step word problems using the four operations.<br>☐ Represent these problems using equations with a letter standing for the unknown quantity.<br>☐ Assess the reasonableness of answers using mental computation and estimation strategies including rounding.<br><br>**DG7-S3-C3-DPO0** Translate a written sentence into a two-step-one variable algebraic equation. |
| 3.OA.9 | Identify arithmetic patterns and explain them using properties of operations.<br><br>**DG3-S3-C1-PO1** Communicate orally or in written form the repetition of objects in pattern and occurring in a sequence of numbers. |

| Number and Operations in Base Ten (NBT) Use place value understanding and properties of operations to perform multi-digit arithmetic | |
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| **2021** | **Standard** |
| 3.NBT.1 | Use place value understanding to round whole numbers to the nearest 10 or 100.<br><br>**DG3-S3-C1-PO3** Solve grade-level appropriate pattern problems. |
| 3.NBT.2 | Fluently add and subtract within 100 using strategies and algorithms based on place value properties of operation and/or the relationship between addition and subtraction.<br><br>**DG3-S3-C1-PO2** Extend a grade-level appropriate repetitive pattern (e.g., 5, 10, 15, 20, …rule: add five or count by five's). |
| 3.NBT.3 | Multiply one digit whole numbers by multiples of 10 in the range 10-90 using strategies based on place value and properties of operations.<br><br>**DG4-S1-C2-PO5** Multiply multi-digit numbers by two digit numbers. |

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<table>
<tr><td colspan="2"><strong>Number and Operations-Fractions (NF)</strong><br><strong>Develop understanding of fractions as numbers</strong></td></tr>
<tr><td><strong>2021</strong></td><td><strong>Standard</strong></td></tr>
<tr><td>3.NF.1</td><td>Understand a fraction 1/<em>b</em> as the quantity formed by 1 part when a whole is partitioned into <em>b</em> equal parts: understand a fraction <em>a/b</em> as the quantity formed by <em>a</em> parts of size 1/<em>b</em>.<br><br><strong>DG3-S1-C2-PO10</strong> State multiplication and division facts through 12s.<br><br><strong>DG3-S1-C2-PO11</strong> Demonstrate the commutative and identity properties of multiplication.</td></tr>
<tr><td>3.NF.2</td><td>Understand and represent a fraction as a number on the number line.<br>□ Represent a fraction 1/<em>b</em> on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into <em>b</em> equal parts. Recognize that each  part has size 1/<em>b</em> and that the endpoint of the part based at 0 locates the number 1/<em>b</em> on the number line.<br>□ Represent a fraction <em>a/b</em> on a number line diagram by marking off  <em>a</em> lengths 1/<em>b</em> from 0. Recognize that the resulting interval has size <em>a/b</em> and that its endpoint locates the number <em>a/b</em> on the number line.<br><br><strong>DG3-S1-C1-DPO4</strong> Identify the fraction represented by a model with a word name and symbol.</td></tr>
<tr><td>3.NF.3</td><td>Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.<br>□ Understand two fractions as equivalent if they are the same size, or the same point on a number line.<br>□ Recognize and generate simple equivalent fractions.<br>□ Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers.<br>□ Compare two fractions with the same numerator or the same denominator by reasoning about their size.<br>□ Recognize that comparisons are valid only when the two fractions refer to the same whole Record the results of comparisons with the symbols >, =, or <, and justify the conclusions.<br>□ Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.</td></tr>
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**DG3-S1-C1-PO19** Determine the equivalency among decimals, fractions, and percents (e.g., half-dollar = 50¢ = 50% and ¼ = 0.25 = 25%).
- □ Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3).
- □ Explain why the fractions are equivalent, e.g., by using a visual fraction model.
- □ Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers.
- □ Compare two fractions with the same numerator or the same denominator by reasoning about their size.
- □ Recognize that comparisons are valid only when the two fractions refer to the same whole.
- □ Record the results of comparisons with the symbols >, =, or <.

| Measurement and Data (MD) | |
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| Solve problems involving measurement and estimation of intervals of time, liquid, volumes, and masses of objects | |
| **2021** | **Standard** |
| 3.MD.1 | Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes. <br><br> **DG3--S4-C4-PO2** Tell time with one-minute precision on an analog clock. <br><br> **DG3-S4-C4-DPO1** Tell time to the nearest minute on digital clocks. |
| 3 MD.2 | Measure and estimate liquid volumes and masses of objects using standard units of grams, kilograms, and liters. <br> □ Add subtract, multiply, or divide to solve one-step word problems involving masses or volume that are given in the same units. |

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| | **DG3-S4-C4-PO4** Measure a given object using the appropriate unit of measure:<br>□ Length-centimeters, millimeters, meters, kilometers<br>□ Capacity/volume-liters<br>□ Mass/weight-grams |
| 3.MD.3 | Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one-and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. |
| 3.MD.4 | Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units-whole numbers, halves, or quarters. |
| 3.MD.5 | Recognize area as an attribute of plane figures and understand concepts of area measurement.<br>□ A square with slide length 1 unit called " a unit square, " is said to have "one square unit" of area and can be used to measure area.<br>□ A plane figure which can be covered without gaps or overlaps by $n$ unit squares is said to have an area of $n$ square units.<br><br>**DG4-S4-C4-PO2** Compute elapsed time using a clock or a calendar. |
| 3.MD.6 | Measure areas by counting unit squares, including square cm, square m, square in, square ft.<br><br>**DG4-S4-C4-PO1** Identify the appropriate measure of accuracy for the area of an object. |
| 3.MD.7 | Relate area to the operations of multiplication and addition.<br>□ Find the area of a rectangle with whole number side lengths by tilting it, and show that the area is the same as would be found by multiplying the side lengths.<br>□ Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real world and mathematical problems, and represent whole number products as rectangular areas in mathematical reasoning. |

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| | ☐ Use tilting to show in a concrete case that the area of a rectangle with whole number side lengths *a* and *b + c* is the sum of *a x b* and *a x c*. Use are models to represent the distributive property in mathematical reasoning.<br>☐ Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping parts, applying this technique to solve real world problems.<br><br>**DG4-S4-C4-DPO2** Solve problems using given formulas for simple area and perimeter. |
| 3.MD.8 | Solve real world and mathematical problems involving perimeters of polygon.<br>☐ Finding the perimeter given the side lengths.<br>☐ Finding an unknown side length.<br>☐ Exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. |

| Geometry (G)<br>Reason with shapes and their attributes | |
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| **2021** | **Standard** |
| 3.G.1 | Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.<br><br>**DG3-S4-S1-DPO2** Compare attributes of 2 and 3 dimensional figures. |
| 3.G.2 | Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.<br><br>**DG3-S4-S1-DPO0** Predict how shapes can be changed by combining or dividing them. |

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| Computation<br>Solve problems involving addition and subtractions of whole numbers. Model and solve simple problems involving multiplication | |
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| **2021** | **Standard** |
| 3.C.1 | Add and subtract whole numbers up to 1,000 with or without regrouping, using relevant properties of the number system. |
| 3.C.2 | Represent the concept of multiplication as repeated addition. |
| 3.C.3 | Represent the concept of division as repeated subtraction, equal sharing, and forming equal groups. |
| 3.C.4 | Know and use the inverse relationship between multiplication and division facts. |
| 3.C.5 | Show mastery of multiplication facts for 0-12. |
| 3.C.6 | Add and subtract simple fractions with the same denominator. |
| 3.C.7 | Use estimation to decide whether answers are reasonable in addition and subtraction problems. |
| 3.C.8 | Use mental arithmetic to add or subtract with numbers less than 100. |