THIRD GRADE

Mathematics Standards for the Archdiocese of Detroit

Operations and Algebraic Thinking

Represent and solve problems involving multiplication and division.	
3.OA.A 1	• Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 × 7.*
3.OA.A 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. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.*
3.OA.A 3	• Use multiplication and division within 144 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.[1]
3.OA.A 4	• Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = _ ÷ 3, 6 × 6 = ? (ie. Fact Families)*
Understand properties of multiplication and the relationship between multiplication and division.	
3.OA.B 5	• Apply properties of operations as strategies to multiply and divide. Examples: *Commutative property of multiplication*-If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. *Associative property of multiplication*- If 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. *Distributive property*-Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56.
3.OA.B 6	• Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by using 8 × ? =32
Multiply and divide within 144.	
3.OA.C 7	• Fluently multiply and divide within 144, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of 0 through 12.

3.OAC.8	• Count orally by 6's 7's 8's 9's 10's 11's and 12's starting with 0, making the connection between repeated addition and multiplication
Solve problems involving the four operations, and identify and explain patterns in arithmetic.	
3.OA.D.9	• Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Students assess the reasonableness of answers using mental computation and estimation strategies including rounding.[3]
3.OA.D.10	• Estimate the sum and difference of two numbers with three-digit(sums up to 1,000), Students assess the reasonableness of estimates
3.OA.D.11	• Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.
3.OA.D.12	• Know that even numbers end in 0,2,4,6, or 8; name a whole number quantity that can be shared in two equal groups or grouped into pairs with no remainders; recognize even numbers as multiples of 2. Know that odd numbers end in 1,3,5,7 or 9, and work with patterns involving even and odd numbers
Number and Operations in Base Ten	
Use place value understanding and properties of operations to perform multi-digit arithmetic.1	
3.NBT.A.1	• Use place value understanding to round whole numbers to the nearest 10, 100 or 1000.
3.NBT.A.2	• Fluently add and subtract within 9,999 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction with and without regrouping.(Formerly composing and decomposing numbers)
3.NBT.A.3	• Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.
3.NBT.A.3	• Read and write numbers to 100,000 in both numerals and words, and relate them to the quantities they represent
3.NBT.A.4	• Identify the place value of a digit in a number and write in expanded notation
3.NBT.A.5	• Compare and order numbers up to 100,000
3.NBT.A.6	• Use mental strategies to fluently add and subtract two-digit numbers
Numbers and Operations-Fractions	
Develop understanding of fractions as numbers.	
3.NF.A.1	• Understand a fraction 1/*b* as the quantity formed by 1 part when *a* whole is partitioned into *b* equal parts; understand a fraction *a*/*b* as the

	quantity formed by *a* parts of size 1/*b*.
3.NF.A.2	• Understand a fraction as a number on the number line; represent fractions on a number line diagram.
3.NF.A.2a	• Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number 1/*b* on the number line.
3.NF.A.2b	• Represent a fraction *a*/*b* on a number line diagram by marking off *a* lengths 1/*b* from 0. Recognize that the resulting interval has size *a*/*b* and that its endpoint locates the number *a*/*b* on the number line.
3.NF.A.3	• Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
3.NF.A.3a	• Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
3.NF.A.3b	• 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.
3.NF.A.3c	• Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.*
3.NF.A.3d	• 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 <, and justify the conclusions, e.g., by using a visual fraction model.
3.NF.A.3.e	• Understand and relate decimals to fractional parts of a dollar
Measurement and Data	
Solve problems involving measurement and estimation	
3.MD.A.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, e.g., by representing the problem on a number line diagram.
3.MD.A.2	• Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).[1] Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.[2]
3.MD.A.3	• Know benchmark temperatures such as freezing, boiling and compare temperatures to these.
3.MD.A.4	• Add and subtract money in dollars and cents
3.MD.A.5	• Solve applied problems involving money.

3.MD.A.6	• Solve applied problems involving length width, height, and weight
3.MD.A.7	• Solve applied problems involving time.
Represent and interpret data	
3.MD.B.8	• 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. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets*.
3.MD.B.9	• 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.
Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	
3.MD.C.10	• Recognize area as an attribute of plane figures and understand concepts of area measurement.
3.MD.C.10a	• A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.
3.MD.C.10b	• 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.
3.MD.C.11	• Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
3MD.D.12	• Relate area to the operations of multiplication and addition.
3MD.C.12a	• Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
3MD.C 12b	• 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.
3MD.C 12c	• Use tiling 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 $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.
3MD.C 12d	• Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.
Geometric measurement: recognize perimeter.	
3MD.D 13	• Solve real world and mathematical problems involving perimeters of

	polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.
Geometry	
Reason with shapes and their attributes.	
3.GA.1	• Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
3.GA.2	• Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.*
3.GA.3	• Identify points, line segments, ray, lines, and distance
3.GA.4	• Identify perpendicular lines and parallel lines in familiar shapes in the classroom
3.GA.5	• Identify parallel faces of rectangular prisms in familiar shapes in the classroom
3.GA.6	• Identify, describe, compare, and classify two-dimensional shapes (parallelogram, trapezoid, circle, rectangle, square, rhombus) based on their component parts (angles, sides, vertices, line segment)
3.GA.7	• Compose and decompose triangles and rectangles to form other familiar two-dimensional shapes (form a rectangle using two congruent right triangles, or decompose a parallelogram into a rectangle and two right triangles
3.GA.8	• Identify, describe, build and classify familiar three-dimensional solids (cube, faces, surfaces, bases, edges, vertices)
3.GA.9	• Represent front, top, and side views of solids built with cubes
Data and Probability	
Use Bar Graphs	
3.DP.1	• Read and interpret bar graphs in both horizontal and vertical forms
3.DP.2	• Read scales on the axis and identify the maximum, minimum and range of values in a bar graph
3.DP.3	• Solve problems using information in bar graphs, including comparison of bar graphs