

PARENT GUIDE
GRADE THREE MATHEMATICS CURRICULUM
DIOCESE OF CLEVELAND

Below is a list of skills your child will be taught in Grade Three Mathematics.

As parents, you are encouraged to support the work of your child's teacher in helping your child acquire each of these skills.

OPERATIONS AND ALGEBRAIC THINKING	
REPRESENT AND SOLVE PROBLEMS INVOLVING MULTIPLICATION AND DIVISION.	
	Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each.
	Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally in to 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.
	Use multiplication and division within 100 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.
	Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
UNDERSTAND PROPERTIES OF MULTIPLICATION AND THE RELATIONSHIP BETWEEN MULTIPLICATION AND DIVISION.	
	Apply properties of operations (commutative, associative, and distributive) as strategies to multiply and divide. [Students need not use formal terms for these operations.]
	Understand division as an unknown-factor problem.
MULTIPLY AND DIVIDE WITHIN 100.	
	Fluently multiply and divide within 100 using strategies such as the relationship between multiplication and division or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
SOLVE PROBLEMS INVOLVING THE FOUR OPERATIONS, AND IDENTIFY AND EXPLAIN PATTERNS IN ARITHMETIC.	
	Solve two-step word problems using the four operations. 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.
	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.
NUMBER AND OPERATIONS IN BASE TEN	
USE PLACE VALUE UNDERSTANDING AND PROPERTIES OF OPERATIONS TO PERFORM MULTI-DIGIT ARITHMETIC. [A RANGE OF ALGORITHMS MAY BE USED]	
	Use place value understanding to round whole numbers to the nearest 10 or 100.
	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
	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.
NUMBER AND OPERATIONS ~ FRACTIONS [LIMITED TO FRACTIONS WITH DENOMINATORS 2, 3, 4, 6, AND 8]	
DEVELOP UNDERSTANDING OF FRACTIONS AS NUMBERS.	
	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 $1/b$.
	Understand a fraction as a number on the number line; represent fractions on a number line diagram.
	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.
	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.

NUMBER AND OPERATIONS ~ FRACTIONS [LIMITED TO FRACTIONS WITH DENOMINATORS 2, 3, 4, 6, AND 8] CONTINUED

DEVELOP UNDERSTANDING OF FRACTIONS AS NUMBERS CONTINUED.

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| | Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. |
| | a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. |
| | b. Recognize and generate simple equivalent fractions, e.g., $\frac{1}{2} = \frac{2}{4}$, $\frac{4}{6} = \frac{2}{3}$). Explain why the fractions are equivalent, e.g., by using a visual fraction model. |
| | c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. |
| | d. 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. |

MEASUREMENT AND DATA

SOLVE PROBLEMS INVOLVING MEASUREMENT AND ESTIMATION OF INTERVALS OF TIME, LIQUID VOLUMES, AND MASSES OF OBJECTS.

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| | 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. |
| | Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). 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. |

REPRESENT AND INTERPRET DATA.

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| | 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. |
| | 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.

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| | Recognize area as an attribute of plane figures and understand concepts of area measurement. |
| | 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. |
| | 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. |
| | Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units). |
| | Relate area to the operations of multiplication and addition. |
| | 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. |
| | 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. |
| | 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. |
| | 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 AS AN ATTRIBUTE OF PLANE FIGURES AND DISTINGUISH LINEAR AND AREA MEASURE.

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| | 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. |
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Geometry

REASON WITH SHAPES AND THEIR ATTRIBUTES.

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.

Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.

DOC: Numbers, Number Sense and Operations

NUMBER AND NUMBER SYSTEMS

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| | Use place value concepts to represent whole numbers and decimals using numerals, words, expanded notation and physical models. |
| | Describe the multiplicative nature of the number system; e.g., the structure of 2406 as 2×1000 plus 4×100 plus 6×1 . |
| | Count money and make change using coins and paper bills to ten dollars. |
| | Represent fractions and mixed numbers using words, numerals and physical models. |
| | Recognize and use decimal and fraction concepts and notations as related ways of representing parts of a whole or a set; e.g., 3 of 10 marbles are red can also be described as $\frac{3}{10}$ and 0.3 are red. |

MEANING OF OPERATIONS

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| | Model, represent and explain multiplication; e.g., repeated addition, skip counting, rectangular arrays and area model. |
| | Understand that, unlike addition and subtraction, the factors in multiplication and division may have different units; e.g., 3 boxes of 5 cookies each. |
| | Model and use the commutative and associative properties for addition and multiplication. |

COMPUTATION AND ESTIMATION

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| | Subtract across zeros with three and four-digit numbers. |
| | Develop and use visual models, benchmarks and equivalents to add and subtract with common fractions and decimals. |

DOC: Measurement

MEASUREMENT UNITS

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| | Read thermometers in both Fahrenheit and Celsius scales. |
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MEASUREMENT TECHNIQUES AND TOOLS

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| | Make estimates for perimeter, area, and volume using connecting links, tiles, cubes and other models. |
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DOC: Patterns, Functions and Algebra

PATTERNS, RELATIONS AND FUNCTIONS

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| | Extend multiplicative and growing patterns, and describe the pattern or rule in words. |
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ANALYZE CHANGE

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| | Create tables to record, organize and analyze data to discover patterns and rules. |
| | Identify and describe quantitative changes, especially those involving addition and subtraction; e.g., a plant growing 3 centimeters each week. |

OH: CCSS: Literacy: Reading: Informational Text

KEY IDEAS AND DETAILS

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| | Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. |
| | Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. |

CRAFT AND STRUCTURE	
	Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.
OH: CCSS: Literacy: Writing	
TEXT TYPES AND PURPOSES	
	Provide reasons that support the opinion.
	Introduce a topic and group related information together; include illustrations when useful to aiding comprehension.
PRODUCTION AND DISTRIBUTION OF WRITING	
	With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose.
OH: CCSS: Literacy: Speaking and Listening	
COMPREHENSION AND COLLABORATION	
	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.
	Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.
	Explain their own ideas and understanding in light of the discussion.
PRESENTATION OF KNOWLEDGE AND IDEAS	
	Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

(Source: [1] National Governors Association Center for Best Practices, Council of Chief State School Officers. 2010. *Common Core State Standards for Mathematics*. Washington, D.C.: National Governors Association Center for Best Practices, Council of Chief State School Officers.[2] Office of Catholic Education. 2007. *Mathematics Curriculum*. Cleveland, Ohio: Office of Catholic Education.)