MATHEMATICS Third Grade

VALUES AND ATTITUDES	The student will: Realize there is a definite sense of order in God's world. Understand numbers, ways of representing numbers, relationships among numbers, and number systems. God's universe is composed of appropriate spacing, measurement and geometric designs. Use visualization, spatial reasoning, and geometric modeling. Understand patterns, relations, and functions. Use the mind's ability to reason. Develop mathematical knowledge through problem solving. Use varied methods for analyzing data.

DIOCESAN STRAND A Number Sense, Numeration, and Numerical Operations

OBJECTIVES

Computation with numbers less than 100,000

- Read and write word names for numbers to 100,000.
- Relate standard and expanded notation on up to 6-digit numbers.
- Use estimation techniques to determine solutions to problems.
- Identify odd and even numbers.

Place value of whole numbers

- Count, read and write whole numbers to 100,000.
- Compare and order numbers to 100,000.
- Identify the place value of numbers to 100,000.
- Round off numbers to 1,000 to the nearest ten, hundred and thousand.
- Use expanded notation to represent numbers, e.g., 1562 = 1000 + 500+60 + 2.

Addition, subtraction, multiplication and division

- Subtract 2, 3 and 4-digit numbers with and without regrouping.
- Add 2, 3, and 4-digit numbers with and without regrouping.
- Model and explain multiplication by repeated addition, rectangular arrays, and skip counting.
- Model and use the identity and commutative properties for addition and multiplication.
- Model and explain division by sharing equally, repeated subtraction, rectangular arrays, and relationship to multiplication.
- Memorize multiplication facts through 10.
- Solve simple problems involving multiplication of multi-digit numbers by one-digit number.
- Use inverse relationship of multiplication/division to compute and check results.
- Solve division problems in which a multi-digit number is evenly divided by a one-digit number.
- Know division facts through 9 by relating to multiplication.
- Determine if there is sufficient information to solve a problem.
- Identify missing or extraneous data in problem-solving situations.

- Solve multi-step problems involving addition, subtraction multiplication, and division.
- Determine the unit cost when given the total cost and number of items.
- Retell a story problem.
- Formulate problems from everyday situations.

Whole numbers, simple fractions and decimals

- Model fractions and mixed numbers using regions and sets.
- Describe relationships of parts to whole.
- Compare and order fractions using models.
- Model equivalent fractions using manipulatives and pictures.
- Add and subtract simple fractions.
- Identify regions divided into congruent parts.
- Compare fractions represented by drawing or concrete items to show equivalency, e.g., ½ pizza = 2/4 pizza that is the same size; show that 3/8 is larger than ¼.
- Illustrate a given fraction using congruent regions and/or sets.
- Solve problems involving addition, subtraction, multiplication and division of money in decimal notation. Multiply and divide money in decimal notation by using whole-number multipliers and divisors.
- Know and understand that fractions and decimals are two different representations of the same concept, e.g., 50 cents is ½ of one dollar, 75 cents is ¾ of a dollar.
- Name/write a decimal to represent tenths and hundredths, when given a model or illustration.

STRAND B Spatial Sense, Measurement, and Geometry

OBJECTIVES

Basic geometric properties

- Draw and classify polygons and polyhedra (solid figures) using appropriate vocabulary: faces, angles, edges, and vertices.
- Describe the rules for grouping.
- Identify and model symmetry and congruence with concrete materials.
- Construct a solid with cubes, to match a given picture or model.
- Recognize and construct a three-dimensional object from same/different perspectives.
- Describe geometry in the environment.

Attributes of plane and solid geometric figures

- Identify, describe and classify polygons including pentagons, hexagons and octagons.
- Identify attributes of triangles including isosceles, equilateral and right.
- Identify attributes of quadrilaterals including parallelogram, rectangle and square.
- Identify right angles in geometric figures or objects and determine whether other angles are greater or less than a right angle.
- Identify, describe and classify common three-dimensional geometric object, e.g., cube, rectangular solid, sphere, prism, pyramid, cone and cylinder.
- Identify common solid objects that are the components needed to make a more complex solid object.

Standard units of metric and customary measurement

- Estimate and measure (metric and US) length (inches, feet, yards, centimeters, millimeters, meters), weight (grams, kilograms, ounces, pounds), and capacity (cups, pints, quarts, gallons, liters, milliliters) using appropriate tools and units.
- Model and compare units within the same measurement system.
- Model and compare standard units of US measurement and metric measurement.
- Model the concepts of area and perimeter using concrete materials, non-standard, and standard units.
- Determine the value of sets of coins to $5.00 and create equivalent amounts using different combinations of coins.
- Estimate and compute the cost of items up to $10.
- Make change up to $10.
- Tell time to the nearest minute with digital and analog clocks; record.
- Solve problems related to time.
- Read Celsius and Fahrenheit thermometers; relate temperatures to everyday situations.
- Solve problems using measurement concepts and procedures.

STRAND C Patterns, Algebra, and Functions

OBJECTIVES

Classification, patterning, and seriation

- Describe attributes of groups and rules for sorting.
- Describe and demonstrate patterns in skip counting and multiplication.
- Continue sequences beyond memorized or modeled numbers.
- Extend and create geometric and numeric sequences.
- Describe patterns in a variety of ways; use calculators and computers when appropriate.
- Use a calculator to analyze patterns and relationships among whole numbers, decimals and rational numbers.
- Identify the application of place value on a calculator.
- Analyze and describe properties of patterns. Create and record similar patterns.
- Use patterns to make predictions and solve problems.
- Use Venn diagrams to illustrate similarities and differences in sets.
- Plot points on a number line.

Number relationships

- Represent relationships of quantities in the form of mathematical expressions, equations or inequalities.
- Solve problems involving numeric equations or inequalities.
- Select appropriate operational and relational symbols to make an expression true, e.g., 4 __ 3 = 12, what operational symbol goes in the blank?
- Express simple unit conversions in symbolic form, e.g.,, __ inches = __ feet X 12.
- Recognize and use the commutative and associative properties of multiplication.
- Solve simple problems involving a functional relationship between two quantities, e.g., find the cost of multiple items given the cost per unit.
- Extend and recognize a linear pattern by its rules.

STRAND D Data, Probability, and Statistics

OBJECTIVES

Data collection, display, and interpretation

- Gather and organize data from surveys and classroom experiments.
- Display data on charts and graphs: picture, bar and line plots.
- Construct graphs using symbols or scales to represent multiple units.
- Read and interpret graphs and charts, e.g., bar, picture, circle, line and line plots; identify main idea, draw conclusions and make predictions.
- Name the ordered pair for a point on the grid.
- Plot positions named by ordered pairs on a coordinate grid.
- Construct time lines to display sequences of events.
- List permutations and combinations of up to three items.

Probability experiments

- Describe the probability of chance events as more or less likely to occur.
- Record possible outcomes for a simple repetitive event.
- Summarize results of probability experiments in a clear and organized way, e.g., bar graphs or line plots.
- Use results of probability experiments to predict future events, e.g., use the line plot to predict the temperature forecast for the next day.

STRAND E Mathematical Reasoning

OBJECTIVES

Problem solving

- Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, sequencing and prioritizing information and observing patterns.
- Determine when and how to break a problem into simple parts.
- Use estimation to verify the reasonableness of calculated results.
- Apply strategies and results from simpler problems to more complex problems.
- Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models to explain mathematical reasoning.
- Express the solution clearly and logically by using the appropriate mathematical notation and terms and clear language; support solutions with evidence in both verbal and symbolic work.
- Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.
- Make precise calculations and check the validity of the results from the context of the problem.
- Evaluate the reasonableness of the solution in the context of the original situation.
- Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.
- Develop generalizations of the results obtained and apply them in other circumstances.