

MATHEMATICS EIGHTH GRADE

VALUES AND ATTITUDES	The student will: Realize that there is a definite sense of order in God's world. Understand numbers, ways of representing numbers, relationships among numbers, and number systems. Understand that 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 varied methods for analyzing data. Use the ability to reason with our mind. Develop mathematical knowledge through problem solving.
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STRAND A Number Sense, Numeration, and Numerical Operations

OBJECTIVES
Real numbers <ul style="list-style-type: none">• Identify subsets of the real number system.• Estimate and compute with rational numbers.• Compare, order, and convert among fractions, decimals, and percents.• Solve problems involving percent of increase and percent of decrease.• Use scientific notation to express large numbers and numbers less than one.• Write numbers given in scientific notation in standard form.• Use rules of exponents.• Estimate the square root of a number between two consecutive integers.• Use a calculator to find the square root of a number to the nearest tenth.• Solve problems involving exponents and scientific notation.• Write whole numbers in exponential form.• Write decimals in scientific notation.• Determine the absolute value of a number.• Apply the commutative, associative, and distributive properties, inverses, and identities in algebraic expressions.• Simplify algebraic expressions.• Analyze problems to determine if there is sufficient data to solve and select appropriate strategies.• Use mathematical operations in practical situations, e.g., interest, discounts, sales tax, etc. Skill using a basic four function calculator with memory <ul style="list-style-type: none">• Determine when appropriate and use a calculator to explore mathematical concepts and relationships.• Use a calculator to solve word problems.• Identify the application of place value on a calculator.• Analyze decimals.

DIOCESAN STRAND B Spatial Sense, Measurement, and Geometry

OBJECTIVES

Properties and relationships in geometry, and standard units of metric and customary measurement

- Interpret and solve problems using geometric concepts and modeling.
- Calculate distances and areas from scale drawings and maps.
- Find the surface area of rectangular solids and cylinders.
- Investigate the relationship of the volume of a cone to a cylinder and a pyramid to a prism with the same base and height..
- Find the volume of prisms, cylinders, pyramids, and cones.
- Solve problems using the Pythagorean Theorem.
- Determine the effect on the volume of solid figures when a dimension(s) is changed.
- Solve problems related to similar and congruent figures.
- Locate, give the coordinates of, and graph plane figures which are the results of rotations.
- Graph plane figures which are similar to a given figure.
- Identify and draw 3-dimensional figures from different perspective using appropriate technology.
- Build 3-dimensional figures given various views.
- Select appropriate units and tools for measurement tasks within problem-solving situations.

STRAND C Patterns, Algebra, and Functions

OBJECTIVES

Patterns, relationships, and fundamental algebraic concepts

- Use formulas to solve problems.
- Solve one and two-step linear equations and inequalities.
- Use ordered pairs to graph a linear equation.
- Investigate the graphs of linear inequalities using appropriate technology.
- Investigate the concept of slope.
- Describe, extend, and analyze a wide variety of geometric and numerical patterns, e.g., Pascal's triangle or the Fibonacci sequence.
- Use functions to solve problems algebraically.

STRAND D Data, Probability, and Statistics

OBJECTIVES

Graphing, probability, and data analysis

- Interpret and construct box plots.
- Collect data involving two variables and display on a scatter plot.
- Identify positive and negative relationships.
- Interpret the mean.
- Explain the sensitivity of the mean to extremes.
- Explain the use of the mean in comparison with the median and the mode.
- Evaluate arguments based on data.
- Discuss random vs. biased sampling.
- Find the probability of independent and dependent events.
- Make predictions based on theoretical probabilities and experimental results.

STRAND E Mathematical Reasoning

SKILLS

Problem solving

- Identify relationships, distinguish relevant from irrelevant information, identify missing information, sequence and prioritize information and observe patterns.
- Determine when and how to break a problem into simpler parts.
- Solve problems using logical reasoning, arithmetic and algebraic techniques.
- Use estimation to verify the reasonableness of results.
- Apply strategies and results from simpler problems to more complex problems.
- Estimate unknown quantities graphically.
- Use inductive and deductive reasoning.
- Explain mathematical reasoning with a variety of methods including words, numbers, symbols, charts, graphs, tables, diagrams, and models.
- Express solution using appropriate mathematical notation, terms and 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. Check validity of results from the context of the problem.
- Evaluate the reasonableness of a solution in the context of the original situation.
- Demonstrate conceptual understanding by noting the method of solution to one problem to solve similar problems.
- Generalize results and strategies solving problems and apply to new problems.