

**Bethlehem Lutheran School  
Math Grade 7 (Pre-Algebra)**

In recognizing the need for understanding and mastering mathematical computations and concepts, the philosophy of the mathematics program is to involve each student in a learning program that blends mathematical skills with practical applications to their daily Christian lives.

**State Standard 1**

*Students develop number sense and use of numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.*

**Classroom objectives**

The student will:

- 1.1 Demonstrate meanings for integers, rational numbers, percents, exponents, square roots, and pi ( $\pi$ ) and use physical materials and technology in problem-solving situations.
- 1.2 Read, write, and order integers, rational numbers, and common irrational numbers such as  $\pi$ .
- 1.3 Apply number theory concepts (for example, primes, factors, and multiples) to represent numbers in various ways.
- 1.4 Use the relationships among fractions, decimals, and percents: include the concepts of ratio and proportion in problem-solving situations.
- 1.5 Develop, test, and explain conjectures about properties of integers and rational numbers.
- 1.6 Use number sense to estimate and justify the reasonableness of solutions to problems involving integers, rational numbers, and common irrational numbers such as  $\pi$ .
- 1.7 Demonstrate meanings for real numbers, absolute value, and scientific notation using physical materials and technology in problem-solving situations.
- 1.8 Solve problems using a four step plan or picture.

**State Standard 2**

*Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.*

**Classroom objectives**

The student will:

- 2.1 Represent, describe, and analyze patterns and relationships using tables, graphs, verbal rules, and standard algebraic notation.
- 2.2 Describe patterns using variables, expressions, equations, and inequalities in problem-solving situations.

**State Standard 3**

*Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.*

**Classroom objectives**

The student will:

- 3.1 Read and construct displays of data using appropriate techniques (for example, line graphs) and appropriate technology.
- 3.2 Display and use measures of central tendency, such as mean, median, and mode, and measures of variability, such as range.
- 3.3 Formulate hypotheses, draw conclusions, and make convincing arguments based on data analysis (science curriculum).
- 3.4 Determine probabilities through experiments or simulations.

- 3.5 Use counting strategies to determine all the possible outcomes from an experiment (for example, the number of ways students can line up to have their picture taken).

#### **State Standard 4**

*Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.*

#### **Classroom objectives**

The student will:

- 4.1 Find the measure of an angle.
- 4.2 Classify geometric shapes according to their properties.
- 4.3 Construct two- and three-dimensional models using a variety of materials and tools.
- 4.4 Describe, analyze, and reason informally about the properties (for example, parallelism, perpendicularity, and congruence) of two- and three-dimensional figures.
- 4.5 Apply the concepts of ratio, proportion, and similarity in problem-solving situations.
- 4.6 Solve problems involving perimeter and area in two dimensions and involving volume in three dimensions.
- 4.7 Use methods to measure perimeter, area, and volume of regular geometric figures.

#### **State Standard 5**

*Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.*

#### **Classroom objectives**

The students will:

- 5.1 Estimate, use, and describe measures of distance, perimeter, area, volume, capacity, weight, and mass.
- 5.2 Use formulas to solve problems involving measurement.
- 5.3 Estimate, make, and use direct and indirect measurements to describe and make comparisons.
- 5.4 Read and interpret various scales including those based on number lines, graphs, and maps.

#### **Standard 6**

*Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers in problem solving situations and communicate the reasoning used in solving these problems.*

#### **Classroom objectives**

The student will:

- 6.1 Use models to explain how ratios, proportions, and percents can be used to solve real-world problems.
- 6.2 Construct, use, and explain procedures to compute with whole numbers, fractions, decimals, and integers.
- 6.3 Select and use appropriate algorithms for computing with commonly-used fractions and decimals, percents, and integers in problem-solving and determine whether the results are reasonable.
- 6.4 Use ratios, proportions, and percents in problem-solving situations.