

Grade Five Mathematics

Standard – Processes or Content Strand

GLE – Grade Level Expectation

SPI – State Performance Indicator

✓ – Check for Understanding

Standard 1 – Mathematical Processes

GLE 0506.1.1 Use mathematical language, symbols, and definitions while developing mathematical reasoning.

✓0506.1.6 Communicate answers in correct verbal and numerical form; including use of mixed numbers or fractions and use of units.

GLE 0506.1.2 Apply and adapt a variety of appropriate strategies to problem solving, including estimation, and reasonableness of the solution.

SPI 0506.1.2 Estimate fraction and decimal sums or differences.

SPI 0506.1.4 Identify missing information and/or too much information in contextual problems.

✓0506.1.2 Make reasonable estimates of fraction and decimal sums or differences using models.

✓0506.1.3 Explore different methods of estimation including rounding and truncating.

✓0506.1.5 Solve problems in more than one way and explain why one process may be more effective than another.

GLE 0506.1.3 Develop independent reasoning to communicate mathematical ideas and derive algorithms and/or formulas.

SPI 0506.1.1 Given a series of geometric statements, draw a conclusion about the figure described.

✓0506.1.1 Make and test conjectures about geometric properties and develop logical arguments to justify conclusions.

GLE 0506.1.4 Move flexibly between concrete and abstract representations of mathematical ideas in order to solve problems, model mathematical ideas, and communicate solution strategies.

✓0506.1.7 Organize and consolidate verbal statements involving fractions and mixed numbers into diagrams, symbols, and numerical expressions.

✓0506.1.8 Use patterns, models, and relationships as contexts for writing inequalities and simple equations.

GLE 0506.1.5 Use mathematical ideas and processes in different settings to formulate patterns, analyze graphs, set up and solve problems and interpret solutions.

GLE 0506.1.6 Read and interpret the language of mathematics and use written/oral communication to express mathematical ideas precisely.

SPI 0506.1.3 Recognize the unit associated with the remainder in a division problem or the meaning of the fractional part of a whole given in either decimal or fraction form.

✓0506.1.4 Explore problems in different contexts to interpret the meaning of remainders as discrete values or not.

✓0506.1.6 Communicate answers in correct verbal and numerical form; including use of mixed numbers or fractions and use of units.

GLE 0506.1.7 Recognize the historical development of mathematics, mathematics in context, and the connections between mathematics and the real world.

✓0506.1.9 Use age-appropriate books, stories, and videos to convey ideas of mathematics.

GLE 0506.1.8 Use technologies/manipulatives appropriately to develop understanding of mathematical algorithms, to facilitate problem solving, and to create accurate and reliable models of mathematical concepts.

Standard 2 - Number and Operations

GLE 0506.2.1 Extend the understanding of place value through millions and millionths in various contexts and representations.

SPI 0506.2.1 Read and write numbers from millions to millionths in various contexts.

GLE 0506.2.2 Write natural numbers (to 50) as a product of prime factors and understand that this is unique (apart from order).

SPI 0506.2.2 Write the prime factorization of numbers through 50 using both exponential and standard notation.

✓0506.2.1 Identify prime numbers up to 50.

✓0506.2.2 Use the prime factorization of two whole numbers to determine the greatest common factor and the least common multiple.

✓0506.2.4 Use divisibility rules to factor numbers.

✓0506.2.10 Use exponential notation to represent repeated multiplication of whole numbers.

GLE 0506.2.3 Develop fluency with division of whole numbers. Understand the relationship of divisor, dividend, and quotient in terms of multiplication and division.

SPI 0506.2.3 Select a reasonable solution to a real-world division problem in which the remainder must be considered.

SPI 0506.2.4 Solve problems involving the division of two- and three-digit whole numbers by one- and two-digit whole numbers.

✓0506.2.7 Understand the placement of the decimal point in calculations of multiplication and long division, including the placement in the estimation of the answer.

✓0506.2.8 Understand that division by zero is undefined.

GLE 0506.2.4 Develop fluency with addition and subtraction of proper and improper fractions and mixed numbers; explain and model the algorithm.

SPI 0506.2.5 Solve addition and subtraction problems involving both fractions and decimals.

SPI 0506.2.6 Add and subtract proper and improper fractions as well as mixed numbers.

✓0506.2.3 Use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals.

✓0506.2.5 Make reasonable estimates of fraction and decimal sums and differences.

✓0506.2.6 Add and subtract mixed numbers.

GLE 0506.2.5 Develop fluency in solving multi-step problems using whole numbers, fractions, mixed numbers, and decimals.

SPI 0506.2.7 Recognize equivalent representations for the same number.

SPI 0506.2.8 Write terminating decimals in the form of fractions or mixed numbers.

SPI 0506.2.9 Compare whole numbers, decimals and fractions using the symbols $<$, $>$, and $=$.

✓0506.2.9 Explore numbers less than 0 by extending the number line through familiar applications (e.g., temperatures below zero, owing money, measuring elevation below sea level).

Standard 3 – Algebra

GLE 0506.3.1 Understand and use order of operations.

SPI 0506.3.1 Evaluate algebraic expressions involving decimals and fractions using order of operations.

SPI 0506.3.2 Evaluate multi-step numerical expressions involving fractions using order of operations.

GLE 0506.3.2 Develop and apply the concept of variable.

✓0506.3.2 Use variables appropriately to represent numbers whose values are not yet known.

✓0506.3.6 Recognize there are many numbers between any two whole numbers on the number line.

GLE 0506.3.3 Understand and apply the substitution property.

✓0506.3.1 Evaluate an expression by substituting non-negative rational number values for letter variables in the expression.

GLE 0506.3.4 Solve single-step linear equations and inequalities.

SPI 0506.3.3 Find the unknown in single-step equations involving fractions and mixed numbers.

SPI 0506.3.4 Given a set of values, identify those that make an inequality a true statement.

✓0506.3.3 Solve single-step linear equations using inverse operations.

✓0506.3.4 Solve single-step linear inequalities and graph solutions on a number line.

✓0506.3.5 Determine if a given value is a solution to a linear equation/inequality.

Standard 4 – Geometry and Measurement

GLE 0506.4.1 Use basic formulas and visualization to find the area of geometric figures.

SPI 0506.4.1 Solve contextual problems that require calculating the area of triangles and parallelograms.

SPI 0506.4.2 Decompose irregular shapes to find perimeter and area.

✓0506.4.1 Develop the formula for the area of a triangle as it relates to the area of a parallelogram/rectangle.

✓0506.4.2 Find the area of a convex polygon by decomposing it into triangles/rectangles.

GLE 0506.4.2 Describe polyhedral solids and analyze their properties, including volume and surface area.

SPI 0506.4.3 Identify a three-dimensional object from two-dimensional representations of that object and vice versa.

SPI 0506.4.4 Solve problems involving surface area and volume of rectangular prisms and polyhedral solids.

✓0506.4.3 Build, draw, and work with prisms by means of orthogonal views, projective views, and nets.

✓0506.4.4 Describe and identify the five regular (Platonic) solids and their properties with respect to faces, shapes of faces, edges, and vertices.

✓0506.4.5 Quantify total volume as filling space with same-sized units of volume without gaps or overlap.

✓0506.4.6 Decompose prisms to calculate surface area and volume.

GLE 0506.4.3 Describe length/distance relationships using the first quadrant of the coordinate system.

SPI 0506.4.5 Find the length of vertical or horizontal line segments in the first quadrant of the coordinate system, including problems that require the use of fractions and decimals.

✓0506.4.8 Identify characteristics of the set of points that define vertical and horizontal line segments.

GLE 0506.4.4 Solve problems that require attention to both approximation and precision of measurement.

SPI 0506.4.6 Record measurements in context to reasonable degree of accuracy using decimals and/or fractions.

- ✓0506.4.7 Understand, select and use units of appropriate size and type to measure angles, lengths/distances, area, surface area and volume.
- ✓0506.4.9 Correctly interpret significant digits in the accuracy of measurements and associated calculations.
- ✓0506.4.10 Recognize that measurements are never exact.
- ✓0506.4.11 Understand the usefulness of approximations.
- ✓0506.4.12 Develop strategies for choosing correct tools of measurement.
- ✓0506.4.13 Recognize and use measures of weight and temperature.

Standard 5 – Data, Probability and Statistics

GLE 0506.5.1 Make, record, display and interpret data and graphs that include whole numbers, decimals, and fractions.

SPI 0506.5.1 Depict data using various representations, including decimal and/or fractional data.

SPI 0506.5.2 Make predictions based on various data representations, including double bar and line graphs.

- ✓0506.5.1 Construct and analyze double bar and line graphs.
- ✓0506.5.2 Represent data using ordered pairs in the first quadrant of the coordinate system.
- ✓0506.5.3 Design investigations to address a question and consider how data collection methods affect the nature of the data set.
- ✓0506.5.4 Recognize the differences in representing categorical and numerical data.

GLE 0506.5.2 Describe the shape and important features of a set of data using the measures of central tendency.

SPI 0506.5.3 Calculate measures of central tendency to analyze data.

- ✓0506.5.5 Evaluate how different measures of central tendency describe data.
- ✓0506.5.6 Identify outliers and determine their effect on mean, median, mode and range.