

At the end of the school year, students will be able to... (Calculators Allowed)

GOAL 6 Numbers Sense and Computation (25%)

Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios and proportions.

STANDARD A

Demonstrate knowledge and use of numbers and their relations and representations in a broad range of theoretical and practical settings.

Representing and Ordering (5%)

- _____ Read, write, and recognize equivalent representations of positive powers of 10. (*Introduce: integer powers of 10*)
- _____ Read, write, recognize, model, and interpret integers, including translating numerical expressions.
- _____ Recognize, translate between, and apply multiple representations of rational numbers (decimals, fractions, mixed numbers, and percents less than 100%. (*Introduce: percents greater than 100% and roots*)
- _____ (*Introduce: Use scientific notation to represent numbers and solve problems.*)
- _____ Represent repeated factors using exponents.
- _____ Order and compare integers, terminating decimals, fractions, and mixed numbers. (*Introduce: rational numbers*)
- _____ Identify and locate integers, decimals, and fractions/mixed numbers on a number line and estimate the locations of square roots. (*Introduce: rational and irrational numbers, e.g., π , $\sqrt{2}$, $\sqrt{5}$*)
- _____ Solve problems involving descriptions of numbers, including characteristics and relationships (e.g., square numbers, primes/composites, prime factorization, greatest common factor, least common multiple.) (*Introduce: exponents and roots*)

STANDARD B

Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication and division) and their properties, algorithms, and relationships.

STANDARD C

Compute and estimate using mental mathematics, paper-and-pencil methods, calculators and computers.

Computation, Operations, Estimation, and Properties (15%)

- _____ Solve problems and number sentences involving addition, subtraction, multiplication, and division using integers, fractions, and decimals. (*Introduce: rational numbers, exponents, and roots*)
- _____ Identify and apply order of operations to simplify numeric expressions involving whole numbers (including exponents), fractions, and decimals. (*Introduce: integers and roots*)
- _____ Identify and apply the following properties of operations with rational numbers: commutative and associative properties for addition and multiplication; distributive property; additive and multiplicative identity properties; the additive and multiplicative inverse properties; and, multiplicative property of zero.
- _____ Demonstrate and apply the relationships between addition/subtraction and multiplication/division with rational numbers.
- _____ (*Introduce: Describe the effect of multiplying and dividing by numbers, including the effect of multiplying or dividing by a rational number by: a number less than zero; zero; a number between zero and one; and, a number greater than one.*)
- _____ Make estimates appropriate to a given situation, and analyze what effect the estimation method used has on the accuracy of results. (*Introduce: Select, use, and justify appropriate operations, methods, and tools to compute or estimate with rational numbers. Verify solutions and determine the reasonableness of results.*)
- _____ Estimate the square root of a number less than 1,000 between two whole numbers e.g., ($\sqrt{41}$ is between 6 and 7.) (*Introduce: cube roots, e.g., $\sqrt[3]{200}$ is between 5 and 6*)

STANDARD D

Solve problems using comparisons of quantities, ratios, proportions and percents.

Ratios, Proportions, and Percents (5%)

- _____ Create and explain ratios that represent a given situation. (*Introduce: Use ratios to describe problem situations.*)
- _____ Use proportional reasoning to model and solve problems.
- _____ Read, write, recognize, model, and interpret percents from 0% to 100%. (*Introduce: percents less than 1% and greater than 100%*)
- _____ Solve number sentences and problems involving fractions, decimals, and percents, (e.g., 50% of 10 is the same as $\frac{1}{2}$ of 10 is the same as 0.5×10 , sales tax, tips, interest, discounts.) (*Introduce: percent increase and decrease*)

GOAL 7 Measurement (15%)

Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

STANDARD A

Measure and compare quantities using appropriate units, instruments and methods.

STANDARD B

Estimate measurements and determine acceptable levels of accuracy.

STANDARD C

Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.

Units, Tools, Estimation, and Applications (15%)

- _____ Select and use appropriate standard units and tools to measure length, mass/weight, capacity, and angles. Sketch, with given specifications, line segments, angles, triangles, and quadrilaterals.
- _____ (*Introduce: Select and use appropriate standard units and tools to solve measurement problems, including measurements of polygons and circles.*)
- _____ Solve problems involving perimeter and area of a polygons and composite figures using diagrams, models, and grids or by measuring or using given formulas (may include sketching a figure from its description). (*Introduce: area and circumference of circles*)
- _____ Compare and estimate length (including perimeter), area, volume, weight/mass, and angles (0° to 180°) using referents. (*Introduce: circumference and angles 0° to 360°*)
- _____ Determine the volume and surface area of a right rectangular prism using an appropriate formula or strategy. (*Introduce: right circular cylinder and composite shapes*)
- _____ Solve problems involving simple unit conversions within the same measurement system for length, weight/mass, capacity, and square units, (e.g., $1 \text{ ft}^2 = 144 \text{ in}^2$.) (*Introduce: measures expressed as rates, e.g., converting feet/second to yards/minute*)
- _____ Solve problems involving scale drawings and maps. (*Introduce: indirect measurement*)

GOAL 8 Algebra (25%)

Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.

STANDARD A

Describe numerical relationships using variables and patterns.

Representations, Patterns, and Expressions (10%)

- _____ Determine a missing term in a sequence, extend a sequence, and construct and identify a rule that can generate the terms of an arithmetic or geometric sequence.
- _____ (*Introduce: Analyze, extend, and create sequences or linear functions, and determine algebraic expressions to describe the n^{th} term m of a sequence.*)
- _____ Write an expression using variables to represent unknown quantities.
- _____ Simplify algebraic expressions by identifying and combining like terms. (*Introduce: Simplify algebraic expressions.*)
- _____ Recognize equivalent forms of algebraic expressions. (*Introduce: generate equivalent forms*)
- _____ Evaluate or simplify algebraic expressions with one or more integer variable values (e.g., $a^2 + b$ for $a = 3$ and $b = -4$.) (*Introduce: rational variable values, e.g., $3a^2 - b$ for $a = 3$ and $b = 7$*)

STANDARD B

Interpret and describe numerical relationships using tables, graphs and symbols.

Connections Using Tables, Graphs, and Symbols (7%)

- _____ Determine how a change in one variable relates to a change in a second variable. (*Introduce: Recognize, describe, and extend patterns using rate of change.*)
- _____ Represent linear equations and quantitative relationships on a rectangular coordinate system, and interpret the meaning of a specific part of a graph.
- _____ Translate between different representations (table, written, graphical, or pictorial) of whole number relationships and linear expressions.
- _____ (*Introduce: Interpret the meaning of slope and intercepts in linear situations.*)
- _____ Identify, graph, and interpret inequalities on a number line. (*Introduce: up to two inequalities with a single variable on a number line including the intersection or union of these inequalities on a number line*)

STANDARD C

Solve problems using systems of numbers and their properties.

STANDARD D

Use algebraic concepts and procedures to represent and solve problems.

Writing, Interpreting, and Solving Equations (8%)

- _____ Represent and analyze problems with linear equations and inequalities.
- _____ Solve linear equations in one variable (e.g., $2x + 3 = 13$) and inequalities involving $<$ or $>$, (e.g., $2x < 6$, $x + 7 > 10$). (*Introduce: Solve linear equations and inequalities over the rational numbers (e.g., $5x + 7 = -13$, $4x - 3 = -7x + 8$, $-2x + 3 > -5$.)*)
- _____ Solve word problems involving unknown quantities (may include more than one step).

GOAL 9 Geometry (20%)

Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space.

STANDARD A

Demonstrate and apply geometric concepts involving points, lines, planes and space.

Properties of Single Figures and Coordinate Geometry (10%)

- _____ Classify, describe, and sketch regular and irregular two-dimensional shapes according to the number of sides, length of sides, number of vertices, and interior angles.
- _____ Solve problems involving two- and three-dimensional shapes.
- _____ Solve problems using properties of triangles and quadrilaterals (e.g., opposite sides of a parallelogram are congruent).
(Introduce: Solve problems that require knowledge of triangle and quadrilateral properties, e.g., triangle inequality.)
- _____ *(Introduce: Find the length of any side of a right triangle using the Pythagorean Theorem – whole number solutions.)*
- _____ Identify, describe, and determine the radius and diameter of a circle. *(Introduce: circumference and relationships to each other and pi)*
- _____ Graph points and identify coordinates of points on the Cartesian coordinate plane (all four quadrants).
- _____ Represent and identify geometric figures using coordinate geometry. *(Introduce: Represent and identify geometric figures using coordinate geometry, including those resulting from transformations.)*
- _____ Analyze the results of a combination of transformations. *(Introduce: Determine a different transformation that could produce the same result.)*
- _____ Identify or analyze relationships of angles formed by intersecting lines. *(Introduce: parallel lines cut by a transversal and angles formed by radii of a circle)*
- _____ Identify and sketch acute, right, and obtuse angles.
- _____ Solve problems involving complementary and supplementary angles.

STANDARD B

Identify, describe, classify and compare relationships using points, lines, planes and solids.

Relationships Between and Among Multiple Figures (10%)

- _____ Identify a three-dimensional object from its net. *(Introduce: Identify front, side, and top views of a three-dimensional solid built with cubes.)*
- _____ Recognize which attributes (such as shape, perimeter, and area) change or don't change when plane figures are composed, decomposed, or rearranged.
- _____ Describe the difference between congruence and similarity. *(Introduce: Solve problems involving congruent and similar figures.)*
- _____ Determine if figures are similar, and identify relationships between corresponding parts of similar figures.
- _____ Determine the distance between two points on a horizontal or vertical number line. *(Introduce: Relate absolute value to distance on the number line.)*

GOAL 10 Data Collection and Statistical Analysis (15%)

Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

STANDARD A

Organize, describe, and make predictions from existing data.

STANDARD B

Formulate questions, design data collection methods, gather and analyze data and communicate findings.

Data Analysis and Statistics (8%)

- _____ Read, interpret, and make predictions from data represented in a bar graph, line (dot) plot, Venn diagram (with two circles), chart/table, line graph, scatterplot, circle graph, or histogram. *(Introduce: interpret possible misleading characteristics, Venn diagram with two or three circles, and stem-and-leaf plot)*
- _____ Compare different representations of the same data. *(Introduce: Compare and contrast effectiveness of different representations of the same data.)*
- _____ Create a bar graph, chart/table, line graph, or circle graph for a given set of data. *(Introduce: and solve a problem using the data in the graph for a given set of data.)*
- _____ Identify a reasonable approximation of the line of best fit from a set of data or a scatter plot. *(Introduce: Draw a reasonable approximation of the line of best fit from a set of data and use the line to make predictions)*
- _____ Determine and use the mode, range, median, and mean to interpret data. *[Introduce: Analyze and apply measures of central tendency (mode, range, median, and mean) in problem-solving situations.]*

STANDARD C

Determine, describe and apply the probabilities of events.

Probability (7%)

- _____ Solve problems involving the probability of a simple or compound event, including representing the probability as a fraction, decimal, or percent. *[Introduce: Solve problems involving the probability of an event composed of repeated trials, compound events (including independent events), or future events with or without replacement.]*
- _____ Represent all possible outcomes for simple events. *(Introduce: sample space, compound events e.g., tables, grids, tree diagrams)*
- _____ Solve simple problems involving the number of ways objects can be arranged – permutations and combinations.