

1. **Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:**
 - A. apply mathematics to problems arising in everyday life, society, and the workplace;
 - B. use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;
 - C. select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;
 - D. communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;
 - E. create and use representations to organize, record, and communicate mathematical ideas;
 - F. analyze mathematical relationships to connect and communicate mathematical ideas; and
 - G. display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.
2. **Number and operations. The student applies mathematical process standards to represent and use rational numbers in a variety of forms. The student is expected to:**
 - A. extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of rational numbers.
3. **Number and operations. The student applies mathematical process standards to add, subtract, multiply, and divide while solving problems and justifying solutions. The student is expected to:**
 - A. add, subtract, multiply, and divide rational numbers fluently; and
 - B. apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers.
4. **Proportionality. The student applies mathematical process standards to represent and solve problems involving proportional relationships. The student is expected to:**
 - A. represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including $d = rt$;
 - B. calculate unit rates from rates in mathematical and real-world problems;
 - C. determine the constant of proportionality ($k = y/x$) within mathematical and real-world problems;
 - D. solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems; and
 - E. convert between measurement systems, including the use of proportions and the use of unit rates.
5. **Proportionality. The student applies mathematical process standards to use geometry to describe or solve problems involving proportional relationships. The student is expected to:**
 - A. generalize the critical attributes of similarity, including ratios within and between similar shapes;
 - B. describe n as the ratio of the circumference of a circle to its diameter; and
 - C. solve mathematical and real-world problems involving similar shape and scale drawings.
6. **Proportionality. The student applies mathematical process standards to use probability and statistics to describe or solve problems involving proportional relationships. The student is expected to:**
 - A. represent sample spaces for simple and compound events using lists and tree diagrams;
 - B. select and use different simulations to represent simple and compound events with and without technology;
 - C. make predictions and determine solutions using experimental data for simple and compound events;
 - D. make predictions and determine solutions using theoretical probability for simple and compound events;
 - E. find the probabilities of a simple event and its complement and describe the relationship between the two;
 - F. use data from a random sample to make inferences about a population;
 - G. solve problems using data represented in bar graphs, dot plots, and circle graphs, including part-to-whole and part-to-part comparisons and equivalents;
 - H. solve problems using qualitative and quantitative predictions and comparisons from simple experiments; and
 - I. determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces.
7. **Expressions, equations, and relationships. The student applies mathematical process standards to represent linear relationships using multiple representations. The student is expected to:**
 - A. represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$.
8. **Expressions, equations, and relationships. The student applies mathematical process standards to develop geometric relationships with volume. The student is expected to:**
 - A. model the relationship between the volume of a rectangular prism and a rectangular pyramid having both congruent bases and heights and connect that relationship to the formulas;
 - B. explain verbally and symbolically the relationship between the volume of a triangular prism and a triangular pyramid having both congruent bases and heights and connect that relationship to the formulas; and
 - C. use models to determine the approximate formulas for the circumference and area of a circle and connect the models to the actual formulas.
9. **Expressions, equations, and relationships. The student applies mathematical process standards to solve geometric problems. The student is expected to:**
 - A. solve problems involving the volume of rectangular prisms, triangular prisms, rectangular pyramids, and triangular pyramids;
 - B. determine the circumference and area of circles;
 - C. determine the area of composite figures containing combinations of rectangles, squares, parallelograms, trapezoids, triangles, semicircles, and quarter circles; and
 - D. solve problems involving the lateral and total surface area of a rectangular prism, rectangular pyramid, triangular prism, and triangular pyramid by determining the area of the shape's net.
10. **Expressions, equations, and relationships. The student applies mathematical process standards to use one-variable equations and inequalities to represent situations. The student is expected to:**
 - A. write one-variable, two-step equations and inequalities to represent constraints or conditions within problems;
 - B. represent solutions for one-variable, two-step equations and inequalities on number lines; and
 - C. write a corresponding real-world problem given a one-variable, two-step equation or inequality.
11. **Expressions, equations, and relationships. The student applies mathematical process standards to solve one-variable equations and inequalities. The student is expected to:**
 - A. model and solve one-variable, two-step equations and inequalities;
 - B. determine if the given value(s) make(s) one-variable, two-step equations and inequalities true; and
 - C. write and solve equations using geometry concepts, including the sum of the angles in a triangle, and angle relationships.
12. **Measurement and data. The student applies mathematical process standards to use statistical representations to analyze data. The student is expected to:**
 - A. compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads;
 - B. use data from a random sample to make inferences about a population; and
 - C. compare two populations based on data in random samples from these populations, including informal comparative inferences about differences between the two populations.
13. **Personal financial literacy. The student applies mathematical process standards to develop an economic way of thinking and problem solving useful in one's life as a knowledgeable consumer and investor. The student is expected to:**
 - A. calculate the sales tax for a given purchase and calculate income tax for earned wages;
 - B. identify the components of a personal budget, including income; planned savings for college, retirement, and emergencies; taxes; and fixed and variable expenses, and calculate what percentage each category comprises of the total budget;
 - C. create and organize a financial assets and liabilities record and construct a net worth statement;
 - D. use a family budget estimator to determine the minimum household budget and average hourly wage needed for a family to meet its basic needs in the student's city or another large city nearby;
 - E. calculate and compare simple interest and compound interest earnings; and
 - F. analyze and compare monetary incentives, including sales, rebates, and coupons.