

<p>1. Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:</p> <ul style="list-style-type: none"> 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. <p>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:</p> <ul style="list-style-type: none"> A. extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of rational numbers. <p>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:</p> <ul style="list-style-type: none"> 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. <p>4. Proportionality. The student applies mathematical process standards to represent and solve problems involving proportional relationships. The student is expected to:</p> <ul style="list-style-type: none"> 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. <p>5. Proportionality. The student applies mathematical process standards to use geometry to describe or solve problems involving proportional relationships. The student is expected to:</p> <ul style="list-style-type: none"> A. generalize the critical attributes of similarity, including ratios within and between similar shapes; B. describe π 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. 	<p>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:</p> <ul style="list-style-type: none"> 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. <p>7. Expressions, equations, and relationships. The student applies mathematical process standards to represent linear relationships using multiple representations. The student is expected to:</p> <ul style="list-style-type: none"> A. represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$. <p>8. Expressions, equations, and relationships. The student applies mathematical process standards to develop geometric relationships with volume. The student is expected to:</p> <ul style="list-style-type: none"> 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. <p>9. Expressions, equations, and relationships. The student applies mathematical process standards to solve geometric problems. The student is expected to:</p> <ul style="list-style-type: none"> 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. 	<p>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:</p> <ul style="list-style-type: none"> 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. <p>11. Expressions, equations, and relationships. The student applies mathematical process standards to solve one-variable equations and inequalities. The student is expected to:</p> <ul style="list-style-type: none"> 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. <p>12. Measurement and data. The student applies mathematical process standards to use statistical representations to analyze data. The student is expected to:</p> <ul style="list-style-type: none"> 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. <p>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:</p> <ul style="list-style-type: none"> 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.
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