Mathematical Process Standards	
7AM.1	**Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding.
Tools to Know	
7AM.1(A)	apply mathematics to problems arising in everyday life, society, and the workplace
7AM.1(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
7AM.1(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

Real Number Relationships	
7AM.2	**Numeracy – foundations with rational numbers.** The student applies mathematical process standards to represent and use rational numbers in a variety of forms.
7AM.5	**Proportionality – geometric ratios.** The student applies mathematical process standards to develop geometric relationships and solve problems.
Student Expectations	
7AM.2(A)	extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of real numbers (**7.2A**, **8.2A**)
7AM.2(B)	approximate the value of an irrational number, including π and square roots of numbers less than 225, and locate that rational number approximation on a number line (**8.2B**)
7AM.2(C)	convert between standard decimal notation and scientific notation (**8.2C**)
7AM.2(D)	order a set of real numbers arising from mathematical and real-world contexts (**8.2D**)
7AM.5(A)	describe π as the ratio of the circumference of a circle to its diameter (**7.5B**)

Rational Number Operations	
7AM.3	**Numeracy – operations with rational numbers.** The student applies mathematical process standards to represent addition, subtraction, multiplication, and division while solving problems and justifying the solutions.
7AM.4	**Numeracy – applications of percents.** The student applies mathematical process standards to represent and solve problems involving percents as proportional relationships.
Student Expectations	
7AM.3(A)	add, subtract, multiply, and divide rational numbers fluently (**7.3A**)
7AM.3(B)	apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers (**7.3B**)
7AM.4(C)	analyze and compare monetary incentives, including sales, rebates, and coupons (**7.13F**)

Proportional Reasoning	
7AM.4	**Numeracy – application of percents.** The student applies mathematical process standards to represent and solve problems involving percents as proportional relationships.
Student Expectations	
7AM.4(A)	solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems (**7.4D**)
7AM.4(B)	calculate and compare simple interest and compound interest earnings (**7.13E**, **8.12D**)

NOTE: Advanced Math standards include alignment/correlation to standard grade level Student Expectations – listed as Readiness (**green**) or Supporting (**orange**) to support assessment implications for STAAR.

Probability

7AM.6 **Proportionality – Probability.** The student applies mathematical process standards to use probability and statistics to describe or solve problems involving proportional relationships.

Student Expectations	
7AM.6(A)	represent sample spaces for simple and compound events using lists and tree diagrams (**7.6A**)
7AM.6(B)	select and use different simulations to represent simple and compound events with and without technology (7.6B)
7AM.6(C)	make predictions and determine solutions using experimental data for simple and compound events (**7.6C**)
7AM.6(D)	make predictions and determine solutions using theoretical probability for simple and compound events (**7.6D**)
7AM.6(E)	find the probabilities of a simple event and its complement and describe the relationship between the two (**7.6E**)
7AM.6(F)	solve problems using qualitative and quantitative predictions and comparisons from simple experiments (**7.6H**)
7AM.6(G)	determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces (**7.6I**)

Linear Relationships

7AM.8 **Two-variable equations and relationships – applications of linear relationships.** The student applies mathematical process standards to develop foundational concept of functions.

7AM.9 **Two-variable equations and relationships – applications of linear relationships.** The student applies mathematical process standards to represent linear relationships using multiple representations.

Student Expectations	
7AM.8(A)	determine the constant of proportionality ($k=y/x$) within mathematical and real-world problems (**7.4C**)
7AM.8(B)	distinguish between proportional and non-proportional situations using tables, graphs, and equations in the form $y = kx$ or $y = mx + b$, where $b \neq 0$ (**8.5F**)
7AM.8(C)	identify examples of proportional and non-proportional functions that arise from mathematical and real-world problems (**8.5H**)
7AM.9(A)	represent linear relationships using verbal descriptions, tables, graphs, and equations in the form $y = mx + b$ (**7.7A**, **8.5A**, **8.5B**, **8.5I**)

Equations and Inequalities

7AM.7 **One-variable expressions, equations, and relationships – applications of one-variable relationships.** The student applies mathematical process standards to use one-variable equations or inequalities in problem situations.

Student Expectations	
7AM.7(A)	represent solutions for one-variable, two-step inequalities on a number line (**7.10B**)
7AM.7(B)	model and solve one-variable, two-step inequalities (**7.11A**)
7AM.7(C)	write one-variable equations or inequalities with variables on both sides that represent problems using rational number coefficients and constants (**8.8A**)
7AM.7(D)	write a corresponding real-world problem when given a one-variable equation or inequality with variables on both sides of the equal sign using rational number coefficients and constants (**8.8B**)
7AM.7(E)	model and solve one-variable equations with variables on both sides of the equal sign that represent mathematical and real-world problems using rational number coefficients and constants (**8.8C**)

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Geometry and Measurement – Geometric Relationships

7AM.5 **Proportionality – geometric ratios.** The student applies mathematical process standards to use geometry to describe or solve problems involving proportional relationships such as dilations.
7AM.10 **Geometric expressions, equations, and relationships – foundations of geometric concepts.** The student applies mathematical process standards to develop geometric relationships and solve problems.
7AM.12 **Geometric expressions, equations, and relationships – transformations.** The student applies mathematical process standards to develop transformational geometry concepts.

Student Expectations	
7AM.5(B)	generalize the critical attributes of similarity, including ratios within and between similar shapes (**7.5A**, **8.3A**)
7AM.5(C)	solve mathematical and real-world problems involving similar shape and scale drawings (**7.5C**)
7AM.5(D)	compare and contrast the attributes of a shape ad its dilation(s) on a coordinate plane (**8.3B**)
7AM.5(E)	use an algebraic representation to explain the effect of a given positive rational scale factor applied to two-dimensional figures on a coordinate plane with the origin as the center of dilation (**8.3C**)
7AM.10(H)	use informal arguments to establish facts about the angle sum and exterior angle of triangles, the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles (**8.8D**)
7AM.12(A)	generalize the properties of orientation and congruence of rotations, reflections, translations, and dilations of two-dimensional shapes on a coordinate plane (**8.10A**)
7AM.12(B)	differentiate between transformations that preserve congruence and those that do not (**8.10B**)
7AM.12(C)	explain the effect of translations, reflections over the *x*- and *y*-axis, and rotations limited to 90^{o}, 180^{o}, 270^{o}, and 360^{o} as applied to two-dimensional shapes on a coordinate plane using an algebraic representation (**8.10C**)
7AM.12(D)	model the effect on linear and area measurements of dilated two-dimensional shapes (**8.10D**)

Geometry and Measurement – Pythagorean Theorem

7AM.10 **Geometric expressions, equations, and relationships – foundations of geometric concepts.** The student applies mathematical process standards to develop geometric relationships and solve problems.
7AM.11 **Geometric expressions, equations, and relationships – applications of geometric concepts.** The student applies mathematical process standards to solve geometric problems.

Student Expectations	
7AM.10(G)	use models and diagrams to explain the Pythagorean theorem (**8.6C**)
7AM.11(F)	use the Pythagorean theorem and its converse to solve problems (**8.7C**)
7AM.11(G)	determine the distance between two points on a coordinate plane using the Pythagorean theorem (**8.7D**)

Geometry and Measurement – Area and Volume

7AM.5 **Proportionality – geometric ratios.** The student applies mathematical process standards to develop geometric relationships and solve problems.
7AM.10 **Geometric expressions, equations, and relationships – foundations of geometric concepts.** The student applies mathematical process standards to develop geometric relationships and solve problems.
7AM.11 **Geometric expressions, equations, and relationships – applications of geometric concepts.** The student applies mathematical process standards to solve geometric problems.

Student Expectations	
7AM.5(A)	describe π as the ratio of the circumference of a circle to its diameter (**7.5B**)
7AM.10(A)	use models to determine the approximate formulas for the circumference and area of a circle and connect the models to the actual formulas (7.8C)
7AM.10(B)	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 (**7.9D**)
7AM.10(C)	describe the volume formula $V = Bh$ of a cylinder in terms of its base area and its height (**8.6A**)
7AM.10(D)	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 (7.8A)
7AM.10(E)	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 (7.8B)
7AM.10(F)	model the relationship between the volume of a cylinder and a cone having both congruent bases and heights and connect that relationship to the formulas (8.6B)
7AM.11(A)	determine the circumference and area of circles (**7.9B**)
7AM.11(B)	determine the area of composite figures containing combinations of rectangles, squares, parallelograms, trapezoids, triangles, semicircles, and quarter circles (**7.9C**)
7AM.11(C)	use previous knowledge of surface area to make connections to the formulas for lateral and total surface area and determine solutions for problems involving rectangular prisms, triangular prisms, and cylinders (**7.9D**, **8.7B**)
7AM.11(D)	solve problems involving the volume of rectangular pyramids and triangular pyramids (**7.9A**)
7AM.11(E)	solve problems involving the volume of cylinders, cones, and spheres (**8.7A**)

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Data Science

7AM.13 **Data science – applications of measurement and data.** The student applies mathematical process standards to use statistical representations and procedures to analyze and describe data.

Student Expectations

7AM.13(A)	use data from a random sample to make inferences about a population (**7.12B**, 7.6F)
7AM.13(B)	compare two populations based on data in random samples from these populations, including informal comparative inferences about differences between the two populations (**7.12C**)
7AM.13(C)	simulate generating random samples of the same size from a population with known characteristics to develop the notion of a random sample being representative of the population from which it was selected (8.11C)
7AM.13(D)	determine the mean absolute deviation and use this quantity as a measure of the average distance data are from the mean using a data set of no more than 10 data points (**8.11B**)

Personal Financial Literacy

7AM.4 **Numeracy – applications of percents.** The student applies mathematical process standards to represent and solve problems involving percents as proportional relationships.

7AM.14 **Personal financial literacy – money management.** 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.

Student Expectations

7AM.4(D)	solve real-world problems comparing how interest rate and loan length affect the cost of credit (**8.12A**)
7AM.4(E)	calculate the total cost of repaying a loan, including credit cards and easy access loans, under various rates of interest and over different periods using an on-line calculator (8.12B)
7AM.4(F)	explain how small amounts of money invested regularly, including money saved for college and retirement, grow over time (**8.12C**)
7AM.4(G)	estimate the cost of a two-year and four-year college education, including family contribution, and devise a periodic savings plan for accumulating the money needed to contribute to the total cost of attendance for at least the first year of college (**8.12G**)
7AM.14(A)	identify the components of 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 (**7.13B**)
7AM.14(B)	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 (**7.13D**)
7AM.14(C)	analyze situations to determine if they represent financially responsible decisions and identify the benefits of financial responsibility and the costs of financial irresponsibility (8.12F)

Mathematical Process Standards

7AM.1 **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding.

Tools to Know

7AM.1(D)	communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate
7AM.1(E)	create and use representations to organize, record, and communicate mathematical ideas
7AM.1(F)	analyze mathematical relationships to connect and communicate mathematical ideas
7AM.1(G)	display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication

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