

**Accelerated 7<sup>th</sup> Grade Math**  
**Unit 1: Understanding Ratio and Proportion**

**\*7.C.6:** Use proportional relationships to solve ratio and percent problems with multiple operations, such as the following: simple interest, tax, markups, markdowns, gratuities, commissions, fees, conversions within and across measurement systems, percent increase and decrease, and percent error.

**7.C.8:** Solve real-world problems with rational numbers by using one or two operations.

**7.GM.2:** Identify and describe similarity relationships of polygons including the angle-angle criterion for similar triangles, and solve problems involving similarity.

**7.GM.3:** Solve real-world and other mathematical problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing. Create a scale drawing by using proportional reasoning.

**7.C.5:** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.

**7.C.8:** Solve real-world problems with rational numbers by using one or two operations.

**7.GM.3:** Solve real-world and other mathematical problems involving scale drawings of geometric figures, including computing actual lengths and from a scale drawing.

**7.C.5:** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.

**7.AF.5:** Graph a line given its slope and a point on the line. Find the slope of a line given its graph.

**7.AF.6:** Decide whether two quantities are in a proportional relationship (e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin).

**7.AF.7:** Identify the unit rate or constant of proportionality in tables, graphs, equations, and verbal descriptions of proportional relationships.

**7.AF.8:** Explain what the coordinates of a point on the graph of a proportional relationship mean in terms of the situation, with special attention to the points (0, 0) and (1,r), where r is the unit rate.

**7.AF.9:** Identify real-world and other mathematical situations that involve proportional relationships. Write equations and draw graphs to represent proportional relationships and recognize that these situations are described by a linear function in the form  $y = mx$ , where the unit rate,  $m$ , is the slope of the line.

**7.C.6:** Use proportional relationships to solve ratio and percent problems with multiple operations, such as the following: simple interest, tax, markups, markdowns, gratuities, commissions, fees, conversions within and across measurement systems, percent increase and decrease, and percent error.

**7.C.8:** Solve real-world problems with rational numbers by using one or two operations

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### **Unit 2: The Real Number System**

**7.C.1:** Understand  $p + q$  as the number located a distance  $|q|$  from  $p$ , in the positive or negative direction, depending on whether  $q$  is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.

**7.C.2:** Understand subtraction of rational numbers as adding the additive inverse,  $p - q = p + (-q)$ . Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

**7.C.8:** Solve real-world problems with rational numbers by using one or two operations.

**7.C.3:** Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as  $(-1)(-1) = 1$  and the rules for multiplying signed numbers.

**7.C.4:** Understand that integers can be divided, provided that the divisor is not zero, and that every quotient of integers (with non-zero divisor) is a rational number. Understand that if  $p$  and  $q$  are integers, then  $-(p/q) = (-p)/q = p/(-q)$ .

**7.C.8:** Solve real-world problems with rational numbers by using one or two operations.

**7.NS.3:** Know there are rational and irrational numbers. Identify, compare, and order rational and common irrational numbers ( $\sqrt{2}$ ,  $\sqrt{3}$ ,  $\sqrt{5}$ ,  $\pi$ ) and plot them on a number line.

**7.C.7:** Compute with rational numbers fluently using a standard algorithmic approach.

**7.C.8:** Solve real-world problems with rational numbers by using one or two operations.

**8.NS.1:** Give examples of rational and irrational numbers and explain the difference between them. Understand that every number has a decimal expansion; for rational numbers, show that the decimal expansion terminates or repeats, and convert a decimal expansion that repeats into a rational number.

**8.NS.2:** Use rational approximations of irrational numbers to compare the size of irrational numbers, plot them approximately on a number line, and estimate the value of expressions involving irrational numbers.

**8.NS.4:** Use square root symbols to represent solutions to equations of the form  $x^2 = p$ , where  $p$  is a positive rational number.

**8.NS.3:** Given a numeric expression with common rational number bases and integer exponents, apply the properties of exponents to generate equivalent expressions.

**8.C.2:** Solve real-world and other mathematical problems involving numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Interpret scientific notation that has been generated by technology, such as a scientific calculator, graphing calculator, or excel spreadsheet.

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**Unit 3: Geometry, Part 1, 2-D and 3-D Shapes**

**7.GM.5:** Understand the formulas for area and circumference of a circle and use them to solve real-world and other mathematical problems; give an informal derivation of the relationship between circumference and area of a circle.

**7.C.7:** Compute with rational numbers fluently using a standard algorithmic approach.

**7.C.8:** Solve real-world problems with rational numbers by using one or two operations.

**7.NS.1:** Find the prime factorization of whole numbers and write the results using exponents.

**7.NS.2:** Understand the inverse relationship between squaring and finding the square root of a perfect square integer. Find square roots of perfect square integers.

**7.NS.3:** Know there are rational and irrational numbers. Identify, compare, and order rational and common irrational numbers ( $\sqrt{2}$ ,  $\sqrt{3}$ ,  $\sqrt{5}$ ,  $\pi$ ) and plot them on a number line.

**7.GM.6:** Solve real-world and other mathematical problems involving volume of cylinders and three-dimensional objects composed of right rectangular prisms.

**7.GM.7:** Construct nets for right rectangular prisms and cylinders and use the nets to compute the surface area; apply this technique to solve real-world and other mathematical problems.

**7.C.7:** Compute with rational numbers fluently using a standard algorithmic approach.

**7.C.8:** Solve real-world problems with rational numbers by using one or two operations.

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### Unit 4: Linear Functions

**7.AF.1:** Apply the properties of operations (e.g., identity, inverse, commutative, associative, distributive properties) to create equivalent linear expressions, including situations that involve factoring (e.g., given  $2x - 10$ , create an equivalent expression  $2(x - 5)$ ). Justify each step in the process.

**7.AF.2:** Solve equations of the form  $px + q = r$  and  $p(x + q) = r$  fluently, where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Represent real-world problems using equations of these forms and solve such problems.

**7.AF.3:** Solve inequalities of the form  $px + q (> \text{ or } \geq) r$  or  $px + q (< \text{ or } \leq) r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Represent real-world problems using inequalities of these forms and solve such problems. Graph the solution set of the inequality and interpret it in the context of the problem.

**7.C.7:** Compute with rational numbers fluently using a standard algorithmic approach.

**7.C.8:** Solve real-world problems with rational numbers by using one or two operations.

**8.AF.4:** Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear, has a maximum or minimum value). Sketch a graph that exhibits the qualitative features of a function that has been verbally described.

**8.AF.6:** Construct a function to model a linear relationship between two quantities given a verbal description, table of values, or graph. Recognize in  $y = mx + b$  that  $m$  is the slope (rate of change) and  $b$  is the  $y$ -intercept of the graph, and describe the meaning of each in the context of a problem.

**8.AF.4:** Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear, has a maximum or minimum value). Sketch a graph that exhibits the qualitative features of a function that has been verbally described.

**8.AF.7:** Compare properties of two linear functions given in different forms, such as a table of values, verbal description, and graph (e.g., compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed).

**8.AF.6:** Construct a function to model a linear relationship between two quantities given a verbal description, table of values, or graph.

**8.AF.3:** Understand that a function assigns to each x-value (independent variable) exactly one y-value (dependent variable), and that the graph of a function is the set of ordered pairs (x,y).

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**8.AF.4:** Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear, has a maximum or minimum value). Sketch a graph that exhibits the qualitative features of a function that has been verbally described.

**8.AF.5:** Interpret the equation  $y = mx + b$  as defining a linear function, whose graph is a straight line.

**8.AF.6:** Construct a function to model a linear relationship between two quantities given a verbal description, table of values, or graph. Recognize in  $y = mx + b$  that  $m$  is the slope (rate of change) and  $b$  is the y-intercept of the graph, and describe the meaning of each in the context of a problem.

**8.AF.7:** Compare properties of two linear functions given in different forms, such as a table of values, equation, verbal description, and graph (e.g., compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed).

**8.AF.4:** Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear, has a maximum or minimum value).

**8.AF.5:** Give examples of functions that are not linear. Describe similarities and differences between linear and nonlinear functions from tables, graphs, verbal descriptions, and equations.

**Accelerated 7<sup>th</sup> Grade Math**  
**Unit 5: Geometry, Part 2**

**7.GM.2:** Identify and describe similarity relationships of polygons including the angle-angle criterion for similar triangles, and solve problems involving similarity.

**7.GM.3:** Solve real-world and other mathematical problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing. Create a scale drawing by using proportional reasoning.

**7.C.7:** Compute with rational numbers fluently using a standard algorithmic approach.

**7.C.8:** Solve real-world problems with rational numbers by using one or two operations.

**7.GM.1:** Draw triangles (freehand, with ruler and protractor, and using technology) with given conditions from three measures of angles or sides, and notice when the conditions determine a unique triangle, more than one triangle, or no triangle.

**7.GM.4:** Solve real-world and other mathematical problems that involve vertical, adjacent, complementary, and supplementary angles.

**7.C.7:** Compute with rational numbers fluently using a standard algorithmic approach.

**7.C.8:** Solve real-world problems with rational numbers by using one or two operations.

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**Unit 6: Data Analysis & Probability**

**7.DSP.1:** Understand that statistics can be used to gain information about a population by examining a sample of the population and generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

**7.DSP.2:** Use data from a random sample to draw inferences about a population. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.

**7.DSP.3:** Find, use, and interpret measures of center (mean and median) and measures of spread (range, interquartile range, and mean absolute deviation) for numerical data from random samples to draw comparative inferences about two populations.

**7.DSP.4:** Make observations about the degree of visual overlap of two numerical data distributions represented in line plots or box plots. Describe how data, particularly outliers, added to a data set may affect the mean and/or median.

**7.DSP.5:** Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Understand that a probability near 0 indicates an unlikely event, a probability around  $\frac{1}{2}$  indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. Understand that a probability of 1 indicates an event certain to occur and a probability of 0 indicates an event impossible to occur.

**7.DSP.6:** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its relative frequency from a large sample.

**7.DSP.7:** Develop probability models that include the sample space and probabilities of outcomes to represent simple events with equally likely outcomes. Predict the approximate relative frequency of the event based on the model. Compare probabilities from the model to observed frequencies; evaluate the level of agreement and explain possible sources of discrepancy.