MATHEMATICS GRADE 7

ALD	Standard	Novice	Partially Proficient	Proficient	Advanced
Policy		The Level 1 student is below proficient in applying mathematics knowledge/skills as specified in the standards. The student generally performs significantly below the standard for the grade level/course, is likely able to partially access grade-level content, and engages with higher-order thinking skills with extensive support.	The Level 2 student is approaching proficient in applying mathematics knowledge/skills as specified in the standards. The student generally performs slightly below the standard for the grade level/course, is able to access grade-level content, and engages in higher-order thinking skills with some independence and support.	The Level 3 student is proficient in applying mathematics knowledge/skills as specified in the standards. The student generally performs at the standard for the grade level/course, is able to access grade-level content, and engages in higher-order thinking skills with some independence and minimal support.	The Level 4 student is highly proficient in applying mathematics knowledge/skills as specified in the standards. The student generally performs significantly above the standard for the grade level/course, is able to access above grade-level content, and engages in higher-order thinking skills independently.
Ratios and Proportional Relationships					
		The Level 1 Student:	**The Level 2 Student:**	**The Level 3 Student:**	**The Level 4 Student:**
Range	7.RP.1	Computes unit rates with ratios of fractions having like units.	Computes unit rates with ratios of fractions, including lengths with like or different units.	Computes unit rates with ratios of fractions, including lengths, areas, and other quantities measured in like or different units.	Computes unit rates with ratios of two mixed numbers having like or different units.
Range	7.RP.2a 7.RP.2b	Decides whether two quantities are in a proportional relationship and identifies the constant of proportionality (unit rate) in a representation that includes (0, 0).	Decides whether two quantities are in a proportional relationship and identifies the constant of proportionality (unit rate) in any simple representation (i.e., tables, equations, diagrams, verbal descriptions, graphs).	Decides whether two quantities are in a proportional relationship and identifies the constant of proportionality (unit rate) in any complex representation (i.e., tables, equations, diagrams, verbal descriptions, graphs).	Extends the given representation or creates a different representation that would represent the same proportional relationship.
Range	7.RP.2c	Identifies the equation that models a relationship from a given representation with a proportional relationship.	Models a proportional relationship using an equation when given a simple table, graph, or verbal description.	Models a proportional relationship using an equation given a complex table, graph, or verbal description.	Creates a representation with a context that would represent a given proportional equation.
Range	7.RP.2d	Explains what any point (x ,y) on the graph of a proportional relationship means in terms of the situation, but cannot identify the unit rate.	Explains what any point (x,y) on the graph of a proportional relationship means in terms of the situation, and can identify the unit rate when given the point (1,r).	Explains what any point (x,y) on the graph of a proportional relationship means in terms of the situation, and can identify the unit rate.	Identifies a point (x,y) on the same graph as the point (1,r) for a proportional relationship and interprets the meaning of (x,y) in terms of the situation.
Range	7.RP.3	Uses proportional relationships to solve simple ratio and percent problems.	Uses proportional relationships to solve simple ratio and percent problems in context.	Uses proportional relationships to solve multi-step ratio and percent problems in context.	Creates equivalent proportional equations that could be used to solve the same ratio/percent problem in context.
Number System					
		The Level 1 Student:	**The Level 2 Student:**	**The Level 3 Student:**	**The Level 4 Student:**

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ALD	Standard	Novice	Partially Proficient	Proficient	Advanced
Range	7.NS.1a 7.NS.1b 7.NS.1c 7.NS.1d	Adds or subtracts rational numbers using a number line or other manipulatives.	Adds or subtracts simple rational numbers. Recognizes that the sum of a number and its opposite equals zero.	Adds or subtracts rational numbers in context and determines the reasonableness of the solution. Understands p + q as the number located a distance |q| from p in a positive or negative direction, and understands subtraction as adding the additive inverse.	Justifies the steps taken to add or subtract rational numbers.
Range	7.NS.2a 7.NS.2b 7.NS.2c 7.NS.2d	Multiplies or divides rational numbers using a number line or other manipulatives.	Multiplies or divides simple rational numbers. Knows that division by zero is undefined.	Multiplies or divides rational numbers and determines the reasonableness of the solution. Understands that -(q/p) = (-p)/q = p/(-q). Converts a rational number to a decimal using long division and knows that the rational number terminates in 0 or eventually repeats.	Interprets products and quotients of rational numbers in a real-world context.
Range	7.NS.3	Solves simple real-world and mathematical problems involving the four operations with rational numbers using the number line or other manipulatives.	Solves simple real-world and mathematical problems involving the four operations with rational numbers.	Solves real-world and multi-step mathematical problems involving the four operations with rational numbers.	Creates a story problem to model a given number sentence.
Expressions and Equations					
		The Level 1 Student:	**The Level 2 Student:**	**The Level 3 Student:**	**The Level 4 Student:**
Range	7.EE.1	Applies and justifies properties of operations used to add, subtract, factor, and expand linear expressions (with whole-number coefficients).	Applies and justifies properties of operations as strategies to add, subtract, factor, and expand linear expressions (with integer coefficients).	Applies and justifies properties of operations as strategies to add, subtract, factor, and expand linear expressions (with rational coefficients expressed in the same form).	Applies and justifies properties of operations as strategies to add, subtract, factor, and expand linear expressions (with rational coefficients expressed in different forms).
Range	7.EE.2	Can identify the commutative property and use it to rewrite an expression in an equivalent form and can explain how the different forms are related.	Can identify the associative and distributive properties and use them to rewrite an expression in an equivalent form and can explain how the different forms are related.	Understands that rewriting an expression in different forms in a problem context can clarify the problem and how the quantities in it are related.	Creates equivalent expressions given a problem context and explains key terms and factors of the problem for each expression.
Range	7.EE.3	Solves simple mathematical problems involving calculations with rational numbers in a variety of forms.	Solves simple real-life and mathematical problems involving calculations with rational numbers in a variety of forms. Assesses the reasonableness of answers using mental computations and estimation.	Solves multi-step mathematical and real-life problems involving calculations with rational numbers in a variety of forms. Converts between forms of a rational number to simplify calculations or communicate solutions meaningfully. Assesses the reasonableness of answers using mental computations and estimation.	Solves and justifies multi-step real-life problems involving calculations with rational numbers in a variety of forms.

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ALD	Standard	Novice	Partially Proficient	Proficient	Advanced
Range	7.EE.4a 7.EE.4b	Solves equations of the form px + q = r and p(x + q) = r (with integer coefficients).	Solves real-world or mathematical problems of the form px + q = r and p(x+ q) = r, or a similarly written inequality, with rational coefficients.	Creates a model and solves real-world or mathematical problems of the form px + q = r and p(x + q) = r, or a similarly written inequality, with rational coefficients. Graphs the solution set of the inequality and interprets the context of the problem.	Creates a real-world problem to model a given equation and/or inequality with rational coefficients and explains what the solution means.
Geometry					
		The Level 1 Student:	**The Level 2 Student:**	**The Level 3 Student:**	**The Level 4 Student:**
Range	7.G.1	Finds actual lengths given a geometric figure and a scale factor.	Finds actual lengths given two similar geometric figures with some unknown side measure.	Computes actual lengths and areas from a scale drawing and reproduces a scale drawing using a different scale.	Explains the relationship between scale factors of length and scale factors of areas for geometric figures.
Range	7.G.2	Constructs geometric shapes given conditions on the sides or angles and determines if they make a particular shape.	Constructs geometric shapes given a combination of angle and side conditions and determines whether they make a particular shape.	Discovers and can explain the conditions for a unique triangle, more than one triangle, or no triangle.	Generalizes a statement about the properties of the sides and angles needed to create triangles. Provides examples to support his or her statement.
Range	7.G.3	Identifies the 2-dimensional figure that results from a vertical or horizontal cross-section of a right rectangular prism.	Identifies the 2-dimensional figure that results from a vertical or horizontal cross-section of right rectangular pyramids.	Describes the 2-dimensional figure that results from a vertical, horizontal, or angled cross-section of a right rectangular prism or pyramid.	Draws the 2-dimensional figure that results from a vertical, horizontal, or angled cross-section of a right prism or pyramid.
Range	7.G.4	Recognizes the formulas for area and circumference of a circle.	Calculates area and circumference with a given radius or diameter and provides the formulas.	Knows and uses the formulas for area and circumference of a circle to solve problems.	Explains how the area and circumference of a circle are related.
Range	7.G.5	Finds the unknown angle given an angle and its relationship (e.g., supplementary, complementary, vertical, and adjacent angles).	Finds any of the unknown angles formed by two intersecting lines when measures are given.	Creates and solves multi-step equations to find an unknown angle measure given a figure with intersecting lines.	Creates and solves multi-step equations to find multiple unknown angle measures given a figure with intersecting lines.
Range	7.G.6	Finds the area of triangles, quadrilaterals, and regular polygons. Finds the volume of cubes and right rectangular prisms.	Solves real-world problems involving surface area of prisms and cylinders given the net. Solves real-world volume problems for cubes and right prisms.	Solves real-world problems involving surface area of composite 3-dimensional figures composed of prisms and cylinders. Solves real-word problems involving volume of composite solids composed of right prisms.	Uses relationships between volume and surface area of 3-dimensional solids to solve real-world problems.
Statistics and Probability					
		The Level 1 Student:	**The Level 2 Student:**	**The Level 3 Student:**	**The Level 4 Student:**

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ALD	Standard	Novice	Partially Proficient	Proficient	Advanced
Range	7.SP.1 7.SP.2	Identifies and recognizes sample populations given a scenario describing the entire population.	Recognizes that a random sample produces the most valid representation of the entire population.	Makes inferences about a population based on representative samples. Uses multiple samples to gauge variations in estimates or predictions.	Identifies real-life situations where random sampling is used and can explain its usefulness.
Range	7.SP.3 7.SP.4	Uses a single measure of central tendency to compare two different populations.	Uses measures of central tendency to draw comparisons about two different populations.	Uses measures of central tendency and variability to compare and contrast inferences about two populations in any context.	Uses measures of variability for numerical data from random samples to draw conclusions about two populations.
Range	7.SP.5	Understands that the probability of a chance event is a number between 0 and 1.	Understands that if the probability of a chance event is closer to 1, it is likely to happen, and if it is closer to 0, it is not likely to happen.	Identifies the probability of a chance event as impossible (0), unlikely, equally likely or unlikely (0.5), more likely or certain (1). Interprets the probabilities as a fraction, decimal, or percent.	Compares probabilities of two or more events and justifies the likelihood of each event.
Range	7.SP.6	Makes approximations of probability for a chance event.	Uses the results of an experiment to estimate the probability of the event.	Observes and predicts the relative frequency of an event given the probability of the event.	Recognizes and justifies why the experimental probability approaches the theoretical probability as the relative frequency of an event increases.
Range	7.SP.7a 7.SP.7b	Determines the theoretical probability of a simple event.	Determines the theoretical probability of a simple event and uses observed frequencies to create a uniform probability model.	Determines the theoretical probability of an event and uses observed frequencies to create a probability model for the data from a chance process (where outcomes are uniform or not uniform).	Compares and justifies the experimental and theoretical probability in a given situation.
Range	7.SP.8a 7.SP.8b 7.SP.8c	Determines the sample space for compound events.	Determines the theoretical probability of a compound event.	Designs a simulation to generate frequencies for compound events.	Compares different simulations to see which best predicts the probability.