

MATH GRADE 7

PLD	Standard	Below Proficient	Approaching Proficient	Proficient	Highly Proficient
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, areas, or other quantities measured in 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.2 (ab)	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.2 (c)	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.2 (d)	Explains what any point (x,y) on the graph of a proportional relationship means in terms of the situation, but not 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:
Range	7.NS.1 (abcd)	Adds or subtracts rational numbers using a number line or other manipulatives.	Adds or subtracts simple rational numbers.	Adds or subtracts rational numbers and determines the reasonableness of the solution. Recognizes that the sum of a number and its opposite equals zero, 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.2 (abcd)	Multiplies or divides rational numbers using a number line or other manipulatives.	Multiplies or divides simple rational numbers.	Multiplies or divides rational numbers and determines the reasonableness of the solution. Understands that $-(p/q) = (-p)/q = p/(-q)$. Converts a rational number to a decimal using long division and knows that the rational number terminates in 0 or eventually repeats. Knows that division by zero is undefined.	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 complex real-world and mathematical problems involving the four operations with rational numbers.	Creates complex real-world and mathematical problems involving the four operations with rational numbers.
Expressions and Equations					
		The Level 1 Student:	The Level 2 Student:	The Level 3 Student:	The Level 4 Student:
Range	7.EE.1	Applies properties of operations used to add, subtract, factor, and expand linear expressions (with whole-number coefficients).	Applies properties of operations as strategies to add, subtract, factor, and expand linear expressions (with integer coefficients).	Applies properties of operations as strategies to add, subtract, factor, and expand linear expressions (with non-mixed and mixed rational coefficients).	Applies and justifies properties of operations as strategies to add, subtract, factor, and expand linear expressions (with non-mixed and mixed rational coefficients).

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 shed light on 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 positive and negative 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 simple mathematical and real-life problems involving calculations with positive and negative 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 complex mathematical and real-life problems involving calculations with positive and negative 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.	Creates complex mathematical and real-life problems involving calculations with positive and negative 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.
Range	7.EE.4 (ab)	Solves equations of the form $px + q = r$ and $p(x + q) = r$ (with rational coefficients).	Solves simple mathematical problems of the form $px + q = r$ and $p(x + q) = r$, with rational coefficients, using equations and inequalities.	Solves simple real-world or mathematical problems of the form $px + q = r$ and $p(x + q) = r$, with rational coefficients, using equations and inequalities.	Solves complex real-world or mathematical problems of the form $px + q = r$ and $p(x + q) = r$, with rational coefficients, using equations and inequalities.

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 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 it makes a particular shape.	Constructs geometric shapes given a combination of angle and side conditions and determines whether it makes a particular shape.	Discovers and explains the conditions necessary for a given set of angles or sides to make a triangle, a unique triangle, more than one triangle, or no triangle.	Justify conditions necessary for a given set of angles or sides to make a triangle, a unique triangle, more than one triangle, or no triangle.
Range	7.G.3	Identifies the 2-dimensional figure that results from a vertical or horizontal cut of a right rectangular prism.	Identifies the 2-dimensional figure that results from a vertical or horizontal cut of right rectangular pyramids.	Describes the 2-dimensional figure that results from a vertical, horizontal, or angled slice of a right rectangular prism or right rectangular pyramid.	Draws the 2-dimensional figure that results from a vertical, horizontal, or angled slice of a right prism or pyramid.

Range	7.G.4	Recognizes the formulas for area and circumference of a circle.	Calculates area and circumference given radius or diameter. Calculates radius or diameter given the circumference.	Understands how and why the formulas for area and circumference of a circle work. Applies the knowledge to solve for simple problems of area of a circle given the circumference or vice versa.	Understands how and why the formulas for area and circumference of a circle work. Applies the knowledge to solve for complex problems of area of a circle.
Range	7.G.5	Identifies supplementary, complementary, vertical, and adjacent angles when measures are given in whole numbers.	Finds the unknown angle given another angle and their relationship to supplementary, complementary, vertical, and adjacent angles when measures are given in whole numbers or algebraic expressions	Creates and solves simple multi-step equations to find unknown angles formed by two intersecting lines when measures are given as algebraic expressions.	Creates and solves complex multi-step equations to find unknown angles formed by two intersecting lines when measures are given as algebraic expressions.
Range	7.G.6	Finds the area of triangles, quadrilaterals, and regular polygons. Finds the volume of cubes and right prisms.	Solves real-world problems involving surface area of 2-dimensional figures. Solve real-world volume problems for cubes and right prisms.	Solves real-world problems involving surface area of composite 2-dimensional figures. Solves real-world problems involving volume of 3-dimensional objects.	Uses relationships between volume and surface area of 3-dimensional shapes to solve real-world problems.
Statistics and Probability					
Range	7.SP.1	Identifies and recognizes sample populations given a scenario describing the entire population.	Understands how 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.	Identify and model real-life situations where random sampling is used and can explain its usefulness.
Range	7.SP.2	*Note: Combined with 7.SP.1			
Range	7.SP.3	Informally uses basic measures of central tendency to compare two different populations.	Informally uses measures of central tendency to draw comparisons about two different populations.	Informally uses measures of central tendency and variability to compare and contrast inferences about two populations in any context.	Informally uses measures of variability for numerical data from random samples to compare and contrast comparative inferences about two populations
Range	7.SP.4	Uses basic measures of central tendency to compare two populations.	Uses measures of central tendency to draw comparisons about two populations.	Uses measures of central tendency and variability for numerical data to compare and contrast inferences about two populations.	Uses measures of central tendency and variability for numerical data from random samples to compare and contrast comparative inferences about two populations.

Range	7.SP.5	Understands that the probability of a chance event is a number between 0 and 1.	Understands that the probability if 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). Interpret 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.7 (ab)	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.8 (abc)	Determines the sample space for compound events.	Determines the theoretical probability of a compound event.	Designs a simulation to generate frequencies for compound events.	Designs and compares different simulations to see which best predicts the probability.