2014 Mathematics Grade 3 Performance Level Descriptors

Level	Basic	Proficient	Advanced
Policy Level Descriptors	Marginal academic performance, work approaching, but not yet reaching, satisfactory performance, indicating partial understanding and limited display of the knowledge and skills included in the Wyoming Content and Performance Standards.	Satisfactory academic performance indicating a solid understanding and display of the knowledge and skills included in the Wyoming Content and Performance Standards.	Superior academic performance indicating an in-depth understanding and exemplary display of the knowledge and skills included in the Wyoming Content and Performance Standards.
Domain	**Operations and Algebraic Thinking**		
Range PLD: Cluster A - Represent and solve problems involving multiplication and division.	Basic students interpret products and quotients of whole numbers (2, 5, 10) using a pictorial representation (3.OA.1, 3.OA.2);	Proficient students interpret products and quotients of whole numbers in mathematical and real-world contexts (3.OA.1);	Advanced students write products and quotients in mathematical and real-world contexts;
	Basic students use multiplication within 100 to solve and represent word problems provided a pictorial representation (3.OA.3);	Proficient students use multiplication and division within 100 to solve and represent word problems provided a pictorial representation (3.OA.3);	Advanced students use multiplication and division within 100 to solve and represent word problems (3.OA.3);
	Basic students determine the product or quotient in an equation given one of the factors to be 2, 5, or 10 (3.OA.4).	Proficient students determine the unknown whole number in a multiplication or division equation given the other two facts (3.OA.4).	Advanced students interpret two or more equations each with an unknown number in a multiplication or division equation (3.OA.4).
Range PLD: Cluster B - Understand properties of multiplication and the relationship between multiplication and division.	Basic students use the commutative property of multiplication to find the product of familiar numbers, e.g. 1, 2, 5, and 10 (3.OA.5);	Proficient students use the associative property to multiply two or more numbers (3.OA.5);	Advanced students use the distributive property to multiply two numbers (3.OA.5);
	Basic students use multiplication to find a missing factor in a division equation (3.OA.6).	Proficient students use division to find a missing factor in a multiplication equation (3.OA.6).	Advanced students use division to find unknown factors given a verbal context (3.OA.6).
Range PLD: Cluster C - Multiply and divide within 100.	Basic students multiply with factors of 2, 5, and 10 and divide with divisors of 2 or 5 within 50 (3.OA.7);	Proficient students fluently multiply two numbers with factors of 10 or less and divide two numbers with both the divisor and quotient being 10 or less (3.OA.7);	Advanced students fluently multiply two numbers within 100 with one factor greater than 10 and one factor less than 10 and divide two numbers within 100 with either a divisor or quotient greater than 10 (3.OA.7);
	Basic students identify the relationship between multiplication and division in a mathematical context (3.OA.7).	Proficient students describe the relationship between multiplication and division (3.OA.7).	Advanced students justify the relationship between multiplication and division (3.OA.7).
Range PLD: Cluster D - Solve problems involving the four operations and identify and explain patterns in arithmetic.	Basic students solve two-step word problems involving only addition and subtraction (3.OA.8);	Proficient students solve and represent as an equation a two-step real-world or mathematical problem using the four operations (3.OA.8);	Advanced students solve and represent as an equation a two-step real-world or mathematical problem involving the four operations and assess the reasonableness of answers (3.OA.8);
	Basic students predict the next term of a pattern described by an addition or a subtraction rule (3.OA.9).	Proficient students predict any term of a pattern and create a rule to describe the pattern (3.OA.9).	Advanced students identify a characteristic of a pattern that is not explicitly given (3.OA.9).

Level	Basic	Proficient	Advanced
Domain	**Number and Operations-Base Ten**		
Range PLD: Cluster E - Use place value understanding and properties of arithmetic to perform multi-digit arithmetic.	Basic students round to the nearest 10 (3.NBT.1);	Proficient students round to the nearest 100 (3.NBT.1);	Advanced students round to the nearest 1,000;
	Basic students add/subtract within 100 (3.NBT.2);	Proficient students add/subtract two or more whole numbers whose sum or difference is less than 1,000 using strategies and algorithms based on place value and properties of operations (3.NBT.2);	Advanced students add/subtract two or more whole numbers whose sum or difference is greater than 1,000 using the relationship between addition and subtraction, place value, or properties of operations (3.NBT.2);
	Basic students multiply one digit (2 or 5) by multiples of 10 (3.NBT.3).	Proficient students multiply one digit whole numbers by multiples of 10 in the range of 10-90 (3.NBT.3).	Advanced students multiply 2-digit whole numbers (less than 20) by multiples of 10.
Domain	**Number and Operations-Fractions**		
Range PLD: Cluster F - Develop understanding of fractions as numbers.	Basic students identify a fraction in the form of a/b given a and b (3.NF.1);	Proficient students understand a fraction $1/b$ as a quantity formed by one part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$ (3.NF.1);	Advanced students represent either a fractional model or a fraction as the sum of unit fractions (3.NF.1);
	Basic students identify and represent fractions with denominators of 2 or 4 on a number line (3.NF.2);	Proficient students identify and represent fractions with denominators of 3, 6, or 8 on a number line (3.NF.2);	Advanced students explain that each part on a number line has a size of $1/b$ and that each interval has the same size (3.NF.2);
	Basic students identify two fractions as equivalent given the same numerators and same denominators (3.NF.3);	Proficient students identify equivalent fractions provided a model or point(s) on a number line (3.NF.3);	Advanced students explain that two fractions are not equivalent because the fractions compare different wholes; determine if two fractions are equivalent (3.NF.3);
	Basic students identify a fraction in the form a/a that is equivalent to 1 (3.NF.3);	Proficient students represent a whole number and a fraction as equivalent; identify a fraction in the form $a/1$ that is equivalent to a (3.NF.3);	Advanced students understand that a/b is a whole number if a is a multiple of b when a does not equal b (3.NF.3);
	Basic students compare, using words, two fractions with a common numerator or denominator provided a model of each fraction (3.NF.3).	Proficient students, given a model, compare two fractions with a common numerator or denominator using the symbols (<, >, or =) (3.NF.3).	Advanced students justify the comparison of two fractions with common numerators or denominators (3.NF.3).

Level	Basic	Proficient	Advanced
Domain	**Measurement and Data**		
Range PLD: Cluster G - Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.	Basic students identify the time from an analog/digital clock to the nearest five minutes (3.MD.1);	Proficient students solve real-world or mathematical problems with addition/subtraction involving elapsed time to the nearest minute (3.MD.1);	Advanced students solve addition/subtraction real-world or mathematical problems of elapsed time involving "regrouping" (3.MD.1);
	Basic students solve one-step problems involving liquid volumes and masses using addition and subtraction (3.MD.2).	Proficient students estimate and solve one-step problems involving liquid volumes and masses using the four operations (3.MD.2).	Advanced students solve one-step problems involving liquid measures and masses using the four operations requiring reading a measurement off of a scaled measurement tool (3.MD.2).
Range PLD: Cluster H - Represent and interpret data.	Basic students read data from a picture graph or bar graph (3.MD.3);	Proficient students interpret data from a picture graph or bar graph and solve problems (3.MD.3);	Advanced students compare data from a picture graph or bar graph to solve multi-step problems (3.MD.3);
	Basic students identify an appropriate line plot using only whole numbers given data (3.MD.4).		Advanced students create a line plot using a fraction scale.
Range PLD: Cluster I - Geometric measurement: understand the concepts of area and relate area to multiplication and to addition.	Basic students recognize that a square labeled with 1 square unit can be used to measure area (3.MD.5);	Proficient students determine the area of a rectangle by counting unit squares in a tiled rectangle (3.MD.6);	
		Proficient students determine the area of a rectangle by multiplying length times width in both mathematical and real-world contexts (3.MD.7);	Advanced students solve for the side of a rectangle by dividing the area by the other side; use area models to show that $a\,(b+c)=(a \times b)+(a \times c)$ (3.MD.7);
	Basic students recognize that two rectangles can fit into a larger rectangle (3.MD.7).	Proficient students solve for the area of a figure by decomposing the figure into two non-overlapping rectangles (3.MD.7).	Advanced students solve for the area of a figure by decomposing the figure into three or more non-overlapping rectangles (3.MD.7).
Range PLD J - Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	Basic students solve for the perimeter of a polygon given all of the side lengths (3.MD.8).	Proficient students solve for the perimeter of a rectangle given the length and width; find one unknown side length of a polygon when given the perimeter in mathematical or real-world contexts (3.MD.8).	Advanced students compare the perimeters and areas of rectangles (3.MD.8).

Level	Basic	Proficient	Advanced
Domain	**Geometry**		
Range PLD: Cluster K - Reason with shapes and their attributes.	Basic students identify a rectangle or square as a quadrilateral (3.G.1).	Proficient students identify a category for a quadrilateral given its attributes (3.G.1);	Advanced students compare two or more quadrilaterals according to their shared attributes (3.G.1);
		Proficient students identify a figure partitioned into equal parts and represent each part as a unit fraction (3.G.2).	Advanced students compare partitioned figures (3.G.2).

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Domain	**Operations and Algebraic Thinking**		
Range PLD: Cluster A - Use the four operations with whole numbers to solve problems.	Basic students identify multiplicative comparisons involving equal groups and arrays using multiplication symbols (4.OA.1);	Proficient students identify equations involving multiplicative comparisons using either multiplication or division symbols (4.OA.1);	Advanced students generate equations involving multiplicative comparisons using either multiplication or division symbols;
	Basic students solve one-step problems involving multiplicative comparisons in mathematical contexts (4.OA.2);	Proficient students solve one-step problems involving multiplicative comparisons in both mathematical and real-world contexts (4.OA.2);	Advanced students solve real-world problems and explain answers;
	Basic students solve one-step problems involving all four operations (+, -, x, and ÷) in both mathematical and real-world contexts (4.OA.3);	Proficient students solve two-step problems involving all four operations (+. -, x, and ÷) in both mathematical and real-world contexts (4.OA.3);	Advanced students solve three-step problems involving all four operations (+, -, x, and ÷) in both mathematical and real-world contexts (4.OA.3);
	Basic students determine if two whole numbers divide evenly (4.OA.3).	Proficient students determine the remainder when two whole numbers are divided (4.OA.3).	Advanced students interpret the meaning of a remainder when two whole numbers are divided (4.OA.3);
			Advanced students assess the reasonableness of answers using estimation strategies (4.OA.3).
Range PLD: Cluster B - Gain familiarity with factors and multiples.	Basic students recognize that a whole number is a multiple of each of its factors (4.OA.4);	Proficient students determine if a whole number in the range of 1-100 is a multiple of a 1-digit number (4.OA.4);	Advanced students determine if a whole number is a multiple of 11, 12, or 15;
	Basic students determine one factor pair for a whole number in the range of 1-100 (4.OA.4).	Proficient students determine all factor pairs for a whole number in the range of 1-100 (4.OA.4).	Advanced students determine if a whole number in the range of 1-100 is prime or composite (4.OA.4).
Range PLD: Cluster C - Generate and analyze patterns.	Basic students predict a term in a pattern (4.OA.5).	Proficient students generate a pattern involving an addition or a subtraction rule and predict a term in a number pattern (4.OA.5).	Advanced students generate a pattern involving multiplication and predict a term in a number pattern (4.OA.5);
			Advanced students identify features of the terms of a pattern that are not explicitly given in the rule (4.OA.5).

Level	Basic	Proficient	Advanced
Domain	**Number and Operations-Base Ten**		
Range PLD: Cluster D - Generalize place value understanding for multi-digit whole numbers.	Basic students recognize that a digit in the tens place is a multiple of 10 (4.NBT.1);	Proficient students recognize that a digit in one place represents 10 times what the same digit represents in the place to the right (4.NBT.1);	Advanced students recognize that a digit in one place represents a multiple of 10 times what another digit represents in the place to the right and apply this relationship as an equation (4.NBT.1);
	Basic students read and write multi-digit whole numbers up to 10,000 (4.NBT.2);	Proficient students read and write multi-digit whole numbers up to 1,000,000 (4.NBT.2);	Advanced students read and write multi-digit whole numbers up to 100,000,000;
	Basic students compare two multi-digit whole numbers up to 1,000 based on the meaning of the digits in each place using <, >, and = (4.NBT.2);	Proficient students compare two multi-digit whole numbers up to 1,000,000 based on the meaning of the digits in each place using <, >, and = (4.NBT.2);	Advanced students explain how to use the digits in multi-digit whole numbers to compare numbers up to 1,000,000 (4.NBT.2);
	Basic students round any multi-digit whole number up to 10,000 to any place (4.NBT.3).	Proficient students round any multi-digit whole number up to 1,000,000 to any place (4.NBT.3).	Advanced students explain how to use the digits in multi-digit whole numbers to round numbers up to 1,000,000 (4.NBT.3).
Range PLD: Cluster E - Use place value understanding and properties of operations to perform multi-digit arithmetic.	Basic students add or subtract two or more numbers whose sum or difference is less than 1,000 using the standard algorithm (4.NBT.4);	Proficient students add or subtract two or more numbers whose sum or difference is less than 1,000,000 using the standard algorithm (4.NBT.4);	Advanced students add or subtract two or more numbers whose sum or difference is greater than 1,000,000 using the standard algorithm;
	Basic students multiply a two-digit number by a one-digit number using strategies based on place value, properties of operations, or models (4.NBT.5);	Proficient students multiply up to a four-digit number by a one-digit number using strategies based on place value, properties of operations, or models (4.NBT.5);	Advanced students multiply a two-digit number by a two-digit number using strategies based on place value, properties of operations, or models (4.NBT.5);
	Basic students determine the quotient of a two-digit dividend by a one-digit divisor with no remainder using strategies based on place value, properties of operations, the relationship between multiplication and division, or models (4.NBT.6).	Proficient students determine the quotient of a dividend with up to four digits and a one-digit divisor with no remainder using strategies based on place value, properties of operations, the relationship between multiplication and division, or models (4.NBT.6).	Advanced students determine the quotient of a dividend with up to four digits and a one-digit divisor with a remainder using strategies based on place value, properties of operations, the relationship between multiplication and division, or models (4.NBT.6).

Level	Basic	Proficient	Advanced
Domain	**Number and Operations-Fractions**		
Range PLD: Cluster F - Extend understanding of fraction equivalence and ordering.	Basic students identify equivalent fractions with unlike denominators (4.NF.1);	Proficient students identify and generate equivalent fractions with unlike denominators (4.NF.1);	Advanced students justify why two fractions are equivalent (4.NF.1);
	Basic students compare two fractions with different numerators or different denominators by using simple fractions such as 1/2 (4.NF.2).	Proficient students compare two fractions with different numerators and denominators using the symbols <, >, or = (4.NF.2).	Advanced students justify how and when valid fractional comparisons can be made (4.NF.2).
Range PLD: Cluster G - Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	Basic students interpret a fraction as a sum of unit fractions (4.NF.3);	Proficient students add and subtract two fractions with like denominators (2, 3, 4, 5, 6, 8, 10, 12, or 100) including mixed numbers in both mathematical and real-world contexts (4.NF.3);	Advanced students use properties of operations and inverse operations to add or subtract two fractions with like denominators including mixed numbers (4.NF.3);
		Proficient students represent addition and subtraction of fractions with like denominators by equations (4.NF.3);	Advanced students identify and represent addition and subtraction of fractions with like denominators in multiple ways (4.NF.3);
	Basic students solve one-step problems involving addition or subtraction of fractions with like denominators in mathematical contexts (4.NF.3);	Proficient students solve one-step problems involving addition or subtraction of fractions with like denominators in real-world contexts (4.NF.3);	Advanced students solve two-step problems involving addition or subtraction of fractions with like denominators in mathematical or real-world contexts (4.NF.3);
	Basic students multiply 2 by a fraction (doubling) (4.NF.4).	Proficient students multiply a whole number times a fraction in the form a/b in both mathematical and real-world contexts (4.NF.4).	Advanced students generalize the multiplication of a whole number and a fraction as $n \times (a/b) = (n \times a)/b$ (4.NF.4).
Range PLD: Cluster H - Understand decimal notation for fractions, and compare decimal fractions.		Proficient students generate equivalent fractions with denominators of 10 and 100 and to add these fractions (4.NF.5);	
		Proficient students write in decimal form, fractions with denominators of 10 or 100 (4.NF.6);	Advanced students justify why two decimals are equivalent (4.NF.6);
	Basic students compare two decimals of the same place value using the symbols <, >, or = (4.NF.7).	Proficient students compare two decimals to hundredths using the symbols <, >, or = (4.NF.7).	Advanced students justify how and when a valid decimal comparison can be made (4.NF.7).

Level	Basic	Proficient	Advanced
Domain	**Measurement and Data**		
Range PLD: Cluster I - Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	Basic students recognize the relative sizes of units of measure within one system (4.MD.1);	Proficient students express measurements within either the metric or customary systems in a larger unit in terms of a smaller unit (4.MD.1);	
	Basic students solve one-step problems involving measurements requiring no conversions using addition or subtraction (4.MD.2);	Proficient students solve one-step problems involving measurements requiring conversions using the four operations (4.MD.2);	Advanced students solve multi-step problems involving measurements requiring conversions using the four operations (4.MD.2);
	Basic students solve for the area or perimeter of a rectangle given a drawing with all four measurements (4.MD.3).	Proficient students solve for the area or perimeter of a rectangle given its length and width in both mathematical and real-world contexts (4.MD.3).	Advanced students solve for the length or width a of a rectangle given its area or perimeter in both mathematical and real-world contexts (4.MD.3).
Range PLD: Cluster J - Represent and interpret data.	Basic students identify a line plot that displays a set of data involving fractional measurements (1/2, 1/4, or 1/8) (4.MD.4).	Proficient students solve problems involving addition and subtraction of fractions (1/2, 1/4, or 1/8) based on data in a line plot (4.MD.4).	Advanced students gather measurement data, plot this data on a line plot, and solve problems involving addition and subtraction of fractions.
Range PLD: Cluster K - Geometric measurement: understand concepts of angles and measure angles.		Proficient students identify the relationship between an angle measure and a circle in which the vertex of the angle is the center of the circle (4.MD.5);	Advanced students explain the relationship between angle measure and a circle in which the vertex of the angle is the center of the circle;
	Basic students identify angles with a specified measure (4.MD.7).	Proficient students solve one-step addition and subtraction problems to find unknown angles on a diagram in mathematical or real-world contexts (4.MD.7).	Advanced students solve multi-step addition and subtraction problems to find unknown angles on a diagram in mathematical or real-world contexts (4.MD.7).
Domain	**Geometry**		
Range PLD: Cluster L - Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	Basic students to classify/identify lines, angles, simple two-dimensional figures, and line-symmetric figures (4.G.1-3).	Proficient students identify lines, segments, rays, angles (right, acute, obtuse), perpendicular and parallel lines on a figure (4.G.1);	
		Proficient students use parallel lines, perpendicular lines, and angles (acute, obtuse, and right) to classify two-dimensional figures including right triangles (4.G.2);	Advanced students compare various two-dimensional figures (4.G.2).
		Proficient students identify line-symmetric figures and identify lines of symmetry (4.G.3).	

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Domain	**Operations and Algebraic Thinking**		
Range PLD: Cluster A - Write and interpret numerical expressions.	Basic students evaluate two-step numerical expressions with no grouping symbols (5.OA.1);	Proficient students evaluate numerical expressions that use one type of grouping symbol to complete the simplification of numerical expressions (5.OA.1);	Advanced students evaluate numerical expressions that use two or more types of grouping symbols to complete the simplification of numerical expressions (5.OA.1);
	Basic students write numerical expressions without grouping symbols (5.OA.2).	Proficient students write numerical expressions that use one type of grouping symbol (5.OA.2).	Advanced students write numerical expressions that use two or more types of grouping symbols (5.OA.2).
Range PLD: Cluster B - Analyze patterns and relationships.	Basic students graph the ordered pairs on the coordinate plane given the ordered pairs of a numeric pattern (5.OA.3).	Proficient students generate the corresponding terms and identify relationships between the corresponding terms, given two rules (5.OA.3).	Advanced students identify and explain features between the corresponding terms of two numerical patterns not explicitly given in the rule (5.OA.3).

Level	Basic	Proficient	Advanced
Domain	**Number and Operations-Base Ten**		
Range PLD: Cluster C - Understand the place-value system.	Basic students recognize that in a multi-digit number, a digit in the ones place represents 10 times as much as it represents in the place to its right (5.NBT.1);	Proficient students recognize that given two different digits in a multi-digit number, one digit can represent a multiple of 10 times the digit to its right, and a multiple of 1/10 the digit to its left (5.NBT.1);	Advanced students recognize that given two different digits in a multi-digit number, one digit can represent a multiple of 100 times the digit two places to its right, and a multiple of 1/100 times the digit two places to its left (5.NBT.1);
	Basic students continue a pattern of a number multiplied by a power of 10 (5.NBT.2);	Proficient students explain patterns in the number of zeros of the product when a number is multiplied by a power of 10 (5.NBT.2);	Advanced students explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10 and use whole-number exponents to denote powers of 10 (5.NBT.2);
	Basic students read and write decimal numbers to hundredths (5.NBT.3);	Proficient students read and write decimal numbers to thousandths (5.NBT.3);	Advanced students read and write decimal numbers past the thousandths place (5.NBT.3);
	Basic students compare two decimal numbers to hundredths using the symbols >, =, and < to record the results of comparisons (5.NBT.3);	Proficient students compare two decimal numbers to thousandths based on the meaning of the digits in each place using the symbols >, =, and < to record the results of comparisons (5.NBT.3);	
	Basic students round decimals to the nearest tenth (5.NBT.4).	Proficient students round decimals to any place (5.NBT.4).	Advanced students use place value understanding to explain how to round decimals to any place (5.NBT.4).
Range PLD: Cluster D - Perform operations with multi-digit whole numbers and with decimals to the hundredths.	Basic students multiply a multi-digit whole number by a single-digit whole number using the standard algorithm (5.NBT.5);	Proficient students multiply a multi-digit whole number by a two-digit whole number using the standard algorithm (5.NBT.5);	Advanced students multiply multi-digit whole numbers by whole numbers with three or more digits using the standard algorithm (5.NBT.5);
	Basic students determine a whole number quotient of a dividend with up to three digits and a one-digit divisor involving whole numbers (5.NBT.6);	Proficient students determine a whole number quotient of a dividend with up to four digits and a two-digit divisor involving whole numbers, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division (5.NBT.6);	Advanced students explain the division of whole numbers up to four-digit dividends and two-digit divisors by using equations, rectangular arrays, and/or area models (5.NBT.6);
	Basic students add and subtract decimals to the hundredths using concrete models (5.NBT.7).	Proficient students use the four operations with decimals to the hundredths using concrete models (5.NBT.7).	Advanced students use the four operations with decimals to the hundredths using concrete models and justifying why a method is appropriate (5.NBT.7).

Level	Basic	Proficient	Advanced
Domain	**Number and Operations-Fractions**		
Range PLD: Cluster E - Use equivalent fractions as a strategy to add and subtract fractions.	Basic students add and subtract proper fractions with unlike denominators (5.NF.1);	Proficient students add and subtract mixed numbers with unlike denominators that require regrouping by replacing the given fractions with equivalent fractions (5.NF.1);	Advanced students use benchmark fractions and number sense of fractions to assess the reasonableness of answers (5.NF.1-2);
	Basic students solve one-step mathematical and real-world problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators (5.NF.2).	Proficient students solve multi-step mathematical and real-world problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators (5.NF.2).	
Range PLD: Cluster F - Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	Basic students identify a fraction written as the quotient of a numerator divided by a denominator in a mathematical context (5.NF.3);	Proficient students solve both mathematical and real-world problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers (5.NF.3);	
	Basic students multiply a fraction by a whole number (5.NF.4);	Proficient students multiply a fraction by a fraction (5.NF.4);	Advanced students explain how to multiply a fraction by a fraction (5.NF.4) and divide a unit fraction by a fraction;
	Basic students solve for the area of a rectangle with sides represented by a whole number and a fraction by multiplying (5.NF.4);	Proficient students solve for the area of a rectangle with fractional side lengths by multiplying and show that tiling a rectangle with unit squares to find the area is the same as multiplying the side lengths of the rectangle (5.NF.4);	Advanced students predict the result of multiplying a whole number by a fraction less than one, by a fraction equal to one, or by a fraction greater than one and predict the sizes of the factors based on the product without performing the indicated multiplication (5.NF.5);
	Basic students solve real-world problems by multiplying a whole number by a fraction (5.NF.6);	Proficient students solve real-world problems involving multiplication of fractions including mixed numbers (5.NF.6);	Advanced students solve multi-step real-world problems involving multiplication of fractions including mixed numbers (5.NF.6);
	Basic students solve for the quotient of a whole number divided by a unit fraction given a model (5.NF.7).	Proficient students both compute and solve real world problems involving the division of a unit fraction by a non-zero whole number or the division of a whole number by a unit fraction (5.NF.7);	Advanced students identify real-world contexts represented by the division of a unit fraction by a non-zero whole number or the division of a whole number by a unit fraction (5.NF.7).

Level	Basic	Proficient	Advanced
Domain	**Measurement and Data**		
Range PLD: Cluster G - Convert like measurement units within a given measurement system.	Basic students convert among different-sized standard measurement units within a given measurement system, given the conversion equivalence and solve one-step mathematical problems requiring one conversion (5.MD.1).	Proficient students convert units within a given measurement system requiring one conversion and solve two-step problems in both mathematical and real-world contexts involving these conversions (5.MD.1).	Advanced students convert among different-sized standard measurement units within a given measurement system requiring multiple conversions and solve real-world problems with three or more steps involving these conversions (5.MD.1).
Range PLD: Cluster H - Represent and interpret data.	Basic students identify a line plot representing a data set with measurements in fractions of a unit (1/2, 1/4, 1/8) (5.MD.2).	Proficient students use one or two operations with fractions to solve problems involving information presented in line plots (5.MD.2).	Advanced students use three or more operations with fractions to solve problems involving information presented in line plots (5.MD.2).
Range PLD: Cluster I - Geometric measurement: understand concepts of volume and relate volume to multiplication and addition.	Basic students determine the definition of a unit cube (5.MD.3);	Proficient students determine volumes by counting improvised units (5.MD.4);	Advanced students use the associative property of multiplication to represent threefold whole number products as volumes (5.MD.5);
	Basic students determine the volume of a rectangular prism by counting the number of unit cubes in a rectangular prism (5.MD.5);	Proficient students show that counting unit cubes to find the volume of a rectangular prism is the same as multiplying the edge lengths of the prism (5.MD.5);	Advanced students show that counting unit cubes to find the volume of a rectangular prism is the same as multiplying the height by the area of the base (5.MD.5);
	Basic students apply the formula $V = l \times w \times h$ to find volumes of right rectangular prisms given whole number edge lengths (5.MD.5).	Proficient students apply the formula $V = l \times w \times h$ to find volumes of right rectangular prisms with whole number edge lengths in both mathematical and real-world contexts (5.MD.5);	Advanced students apply the formula $V = b \times h$ to find volumes of right rectangular prisms with whole number edge lengths in both mathematical and real-world contexts (5.MD.5);
		Proficient students add two volumes to solve real-world problems (5.MD.5).	Advanced students solve real-world problems by finding volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts (5.MD.5).

Level	Basic	Proficient	Advanced
Domain	**Geometry**		
Range PLD: Cluster J - Graph points on the coordinate plane to solve real-world and mathematical problems.	Basic students name the components of a coordinate system (5.G.1);	Proficient students describe the components of a coordinate system and understand the use of a coordinate system (1st Quadrant only) (5.G.1);	Advanced students name, use, and describe the components of a coordinate system (1st Quadrant only) (5.G.1);
	Basic students locate a point in the first quadrant using an ordered pair (5.G.1).	Proficient students represent both mathematical and real-world contexts by graphing points in the first quadrant of the coordinate plane (5.G.2).	Advanced students interpret coordinate values of points in the context of the situation (5.G.2).
Range PLD: Cluster K - Classify two-dimensional figures into categories based on their properties.	Basic students classify two-dimensional figures into basic subcategories (5.G.3,4).	Proficient students classify two-dimensional figures in a hierarchy based on properties (5.G.3,4).	Advanced students evaluate simple logical arguments to show that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category (5.G.3,4).

Level	Basic	Proficient	Advanced
Policy Level Descriptors	Marginal academic performance, work approaching, but not yet reaching, satisfactory performance, indicating partial understanding and limited display of the knowledge and skills included in the Wyoming Content and Performance Standards.	Satisfactory academic performance indicating a solid understanding and display of the knowledge and skills included in the Wyoming Content and Performance Standards.	Superior academic performance indicating an in-depth understanding and exemplary display of the knowledge and skills included in the Wyoming Content and Performance Standards.
Domain	**Ratios and Proportional Relationships**		
Range PLD: Cluster A - Understand ratio concepts and use ratio reasoning to solve problems.	Basic students write a ratio relationship between two quantities (6.RP.1);	Proficient students describe a ratio relationship between two quantities, including comparing one of the quantities to the total (6.RP.1);	
	Basic students write a unit rate to describe two quantities using whole numbers (6.RP.2);	Proficient students write a unit rate to describe two quantities using rational numbers and use unit rate language to describe two quantities (6.RP.2);	Advanced students explain the concept of a unit rate using unit rate language (6.RP.2);
	Basic students make tables of equivalent ratios relating quantities with whole number measurements and plot the pairs of values on the coordinate plane (6.RP.3);	Proficient students determine missing values in tables of equivalent ratios relating quantities with whole number measurements (6.RP.3);	Advanced students compare ratios using tables of equivalent ratios relating quantities with whole number measurements (6.RP.3);
	Basic students solve unit rate problems given the unit rate (6.RP.3);	Proficient students solve unit rate problems that require determining a unit rate (6.RP.3);	Advanced students solve unit rate problems that require determining two unit rates (6.RP.3);
	Basic students solve for a percent of a quantity given the whole of 10 or 100 (6.RP.3);	Proficient students solve, in a mathematical context, for a percent of a quantity as a rate per 100 and to solve problems that involve finding the whole, given the part and the percent (6.RP.3);	Advanced students solve, in a real-world context, for a percent of a quantity as a rate per 100 and to solve problems that involve finding the whole, given the part and the percent (6.RP.3);
	Basic students use ratio reasoning to convert measurement units within the same system (6.RP.3).	Proficient students use ratio reasoning to convert measurement units and to transform units appropriately when multiplying or dividing quantities (6.RP.3).	Advanced students use ratio reasoning to convert measurement units and transform units appropriately when multiplying and dividing in a real-world context (6.RP.3).

Level	Basic	Proficient	Advanced
Domain	**The Number System**		
Range PLD: Cluster B - Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	Basic students compute quotients of a fraction by a unit fraction (6.NS.1);	Proficient students compute quotients of any two fractions including a mixed number (6.NS.1);	
	Basic students solve problems in mathematical contexts involving division of a fraction by a unit fraction (6.NS.1).	Proficient students solve problems in mathematical contexts involving division of fractions by fractions (6.NS.1).	Advanced students interpret quotients of fractions by identifying real-world contexts (6.NS.1).
Range PLD: Cluster C - Compute fluently with multi-digit numbers and find common factors and multiples.	Basic students divide three-digit or four-digit dividends by two-digit divisors using the standard algorithm (6.NS.2);	Proficient students divide multi-digit numbers with fractional remainders using the standard algorithm (6.NS.2);	
	Basic students add, subtract, multiply, or divide decimals to tenths using the standard algorithms (6.NS.3);	Proficient students add, subtract, multiply, or divide decimals to hundredths using the standard algorithms (6.NS.3);	Advanced students add, subtract, multiply, or divide decimals to thousandths using the standard algorithms for each operation (6.NS.3);
	Basic students determine the greatest common factor of two whole numbers less than or equal to 20 and the least common multiple of two prime numbers less than or equal to 12 (6.NS.4).	Proficient students determine the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12 (6.NS.4).	Advanced students use the distributive property to express a sum of two whole numbers between 1 and 100 with a common factor times the sum of two whole numbers with no common factor (6.NS.4).
Range PLD: Cluster D - Apply and extend previous understandings of numbers to the system of rational numbers.		Proficient students represent quantities in real-world contexts using rational numbers; do simple applications involving positive and negative numbers (6.NS.5);	
	Basic students represent one integer on a horizontal number line (6.NS.6);	Proficient students represent two or more rational numbers on a horizontal number line (6.NS.6);	
	Basic students graph ordered pairs of integers in the first quadrant of a coordinate plane (6.NS.6);	Proficient students graph ordered pairs of integers in all four quadrants of a coordinate plane (6.NS.6);	Advanced students identify the quadrant a point lies in given descriptions of its coordinates with real-world context (6.NS.6);
	Basic students compare a positive and a negative number (6.NS.7);	Proficient students compare two or more rational numbers (6.NS.7);	Advanced students explain statements of order for rational numbers in real-world contexts (6.NS.7);
		Proficient students determine the absolute value of a rational number and explain the absolute value of any rational number as its distance from 0 on the number line (6.NS.7);	Advanced students explain statements of order of absolute values (6.NS.7);
		Proficient students solve problems in both mathematical and real-world contexts by graphing points in all four quadrants of the coordinate plane (6.NS.8);	
	Basic students use coordinates to find distances between points with the same first coordinate or the same second coordinate in the first quadrant (6.NS.8).	Proficient students use coordinates to find distances between points with the same first coordinate or the same second coordinate in all four quadrants (6.NS.8).	Advanced students use coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate in all four quadrants (6.NS.8).

Level	Basic	Proficient	Advanced
Domain	**Expressions and Equations**		
Range PLD: Cluster E - Apply and extend previous understandings of arithmetic to algebraic expressions.	Basic students write and evaluate one-step numerical expressions involving one whole number exponent (6.EE.1);	Proficient students write and evaluate multi-step numerical expressions involving whole number exponents (6.EE.1);	Advanced students write and evaluate numerical multi-step expressions involving the distributive property and whole number exponents (6.EE.1);
	Basic students write and read one-step expressions with rational numbers with variables (6.EE.2);	Proficient students write and read two-step expressions with rational numbers with variables (6.EE.2);	Advanced students write and read three-step or four-step expressions with rational numbers with variables (6.EE.2);
	Basic students evaluate one-step or two-step expressions with whole numbers given the value of the variable, using the order of operations (6.EE.2);	Proficient students evaluate expressions with up to three steps given the values of up to two variables, using the order of operations (6.EE.2);	Advanced students evaluate expressions with more than three steps given the values of up to two variables, using the conventional order of operations (6.EE.2);
		Proficient students identify parts of an expression using mathematical language (6.EE.2);	
	Basic students apply the properties of operations to identify equivalent expressions based on the commutative property (6.EE.3).	Proficient students apply the properties of operations to identify and generate equivalent expressions (6.EE.3).	Advanced students explain why two expressions are equivalent (6.EE.3, 4).
Range PLD: Cluster F - Reason about and solve one-variable equations and inequalities.		Proficient students understand solving a one-variable equation or one-variable inequality as a process of answering the question "which values from a specified set, if any, make the equation or inequality true?" (6.EE.5);	
	Basic students use substitution to determine whether a given whole number in a specified set makes a one-step equation or a one-step inequality true (6.EE.5);	Proficient students use substitution to determine whether a given non-negative rational number in a specified set makes a one-step equation or a one-step inequality true (6.EE.5);	Advanced students use substitution to determine whether a given rational number in a specified set makes a two-step equation or a two-step inequality true;
	Basic students understand that a variable represents an unknown number (6.EE.6);	Proficient students understand and use variables to represent numbers and write expressions with only one operation and only one variable when solving problems in both mathematical and real-world contexts (6.EE.6);	Advanced students understand and use variables to represent numbers and write expressions with two or more operations and only one variable when solving problems in both mathematical and real-world contexts;
	Basic students solve both mathematical and real-world contexts by solving equations of the form $x + p = q$ or $x - p = q$ for cases in which p, q and x are all whole numbers (6.EE.7);	Proficient students solve problems in both mathematical and real-world contexts by writing and solving equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ for cases in which p, q, and x are all whole numbers or positive rational numbers (6.EE.7);	Advanced students solve both mathematical and real-world contexts by writing and solving equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ for cases in which p, q, and x are all non-negative rational numbers (6.EE.7);
	Basic students write an inequality of the form $x > c$ or $x < c$ to represent a mathematical context (6.EE.8).	Proficient students write an inequality of the form $x > c$ or $x < c$ to represent real world contexts and recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions and represent and interpret solutions of inequalities on number line diagrams (6.EE.8).	Advanced students write an inequality of the form $x \geq c$ or $x \leq c$ to represent real world contexts, recognize that inequalities of the form $x \geq c$ or $x \leq c$ have infinitely many solutions, and represent and interpret solutions of inequalities of the form $x \geq c$ or $x \leq c$ on number line diagrams.

Level	Basic	Proficient	Advanced
Domain		**Expressions and Equations (cont.)**	
Range PLD: Cluster G - Represent and analyze quantitative relationships between dependent and independent variables.	Basic students describe in words the apparent relationship between the values of two variables given in a table (6.EE.9).	Proficient students write equations to represent the apparent relationship between the values of two variables given in a table or a graph (6.EE.9).	Advanced students analyze the relationship between the dependent and independent variables using graphs and tables and relate these to the equation (6.EE.9).
Domain		**Geometry**	
Range PLD: Cluster H - Solve real-world and mathematical problems involving area, surface area, and volume.	Basic students determine the area of right triangles by composing into rectangles in both mathematical and real-world contexts (6.G.1);	Proficient students determine the area of triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes in both mathematical and real-world contexts (6.G.1);	Advanced students find a missing dimension given the area of a triangle or a special quadrilateral and all but one dimension;
	Basic students apply the formulas $V = lwh$ to find volumes of right rectangular prisms with two whole-number edge lengths and one fractional edge length in both mathematical and real-world contexts (6.G.2);	Proficient students apply the formulas $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in both mathematical and real-world contexts (6.G.2);	Advanced students apply the formulas $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths and perform additional operations with the volume to solve real-world problems (6.G.2);
	Basic students solve for the area of a rectangle given the coordinates of three points, one being the origin, on the coordinate plane in both mathematical and real-world contexts (6.G.3);	Proficient students solve for the area of a rectangle given the coordinates of three vertex points, excluding the origin, on the coordinate plane in both mathematical and real-world contexts (6.G.3);	Advanced students solve for the area of a right triangle or a rectangle given coordinates for two points on the coordinate plane to solve problems in both mathematical and real-world contexts (6.G.3);
	Basic students identify the net of a right prism (6.G.4).	Proficient students represent three-dimensional figures using nets made up of rectangles and triangles and use nets to find the surface area of three-dimensional figures (6.G.4).	Advanced students use nets to find the surface area of three-dimensional figures in both mathematical and real-world contexts (6.G.4).

Level	Basic	Proficient	Advanced
Domain	**Statistics and Probability**		
Range PLD: Cluster I - Develop understanding of statistical variability.		Proficient students recognize a statistical question as one that anticipates variability (6.SP.1);	Advanced students create a statistical question as one that anticipates variability;
		Proficient students understand that a set of data can be described by its center, spread, and overall shape (6.SP.2);	Advanced students make generalizations about the center, the spread, and the overall shape of the distribution of a numerical data set presented in a graph (6.SP.2);
	Basic students understand that the mean and the median are measures of center (6.SP.3).	Proficient students understand that the mean and the median are measures of center, and the mean absolute deviation and the interquartile range are measures of variation for a numerical data set (6.SP.3).	Advanced students make generalizations about the mean absolute deviation and the interquartile range as measures of variation for a numerical data set (6.SP.3).
Range PLD: Cluster J - Summarize and describe distributions.		Proficient students display numerical data in plots on a number line, including dot plots, histograms, and box plots (6.SP.4);	
	Basic students report the number of observations found in a numerical data set (6.SP.5).	Proficient students use data to describe the nature of an attribute under investigation, including how it was measured and its units of measurement (6.SP.5);	Advanced students use measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation) for a numerical data set to describe the distribution of the data without calculating the measures (6.SP.5);
		Proficient students calculate measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation) for a numerical data set (6.SP.5).	Advanced students demonstrate and describe the relationship between the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

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Domain	**Ratio and Proportional Relationships**		
Range PLD: Cluster A - Analyze proportional relationships and use them to solve real-world and mathematical problems.	Basic students compute unit rates associated with ratios of integers (7.RP.1);	Proficient students compute unit rates associated with ratios of like or unlike rational numbers (7.RP.1);	Advanced students compute unit rates associated with ratios of rational numbers including complex fractions (7.RP.1);
	Basic students determine whether two quantities are a proportional relationship (7.RP.2);	Proficient student determine whether two quantities are a proportional relationship in a table of values or graph (7.RP.2);	Advanced students determine whether two quantities are a proportional relationship in a verbal description or equation (7.RP.2);
	Basic students identify the constant of proportionality as a unit rate (7.RP.2);	Proficient student identify the constant of proportionality (unit rate) in graphs, tables, equations, and diagrams (7.RP.2);	Advanced students identify the constant of proportionality (unit rate) in verbal descriptions (7.RP.2);
		Proficient student create equations that represent proportional relationships (7.RP.2);	
	Basic students identify the x - and y -coordinates on a graph in a real-world context (7.RP.2);	Proficient student explain what a point (x , y) on the graph of a proportional relationship means in terms of the situation it models (7.RP.2);	Advanced students identify the coordinates of another point which follows the proportional relationship and explain the reasoning;
	Basic students solve for an unknown value in proportional problems given the equation $a/b = c/d$ (7.RP.3).	Proficient student use proportional relationships to solve ratio and percent problems that require multi-steps (7.RP.3).	Advanced students use proportional relationships to solve ratio and percent problems that require multi-steps in a real-world context (7.RP.3).

Level	Basic	Proficient	Advanced
Domain	**The Number System**		
Range PLD: Cluster B - Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	Basic students add and subtract two integers (7.NS.1);	Proficient student add and subtract up to three rational numbers (7.NS.1);	Advanced students add and subtract four or more rational numbers and justify the sum or difference of rational numbers using properties of addition and subtraction, numbers, and number lines (7.NS.1);
	Basic students multiply and divide two integers (7.NS.2);	Proficient student multiply and divide up to three rational numbers (7.NS.2);	Advanced students multiply and divide four or more rational numbers and justify the product or quotient of rational numbers using properties of multiplication and division, numbers, and number lines (7.NS.2);
	Basic students identify a rational number as a quotient of integers given the divisor is not zero (7.NS.2);	Proficient student convert a fraction into a terminating or repeating decimal and a terminating decimal into a fraction using long division (7.NS.2);	Advanced students convert a repeating decimal into a fraction (7.NS.2);
	Basic students solve mathematical problems involving at least two of the operations with integers (7.NS.3).	Proficient student solve mathematical and real-world problems involving at least two of the operations with rational numbers (7.NS.3).	Advanced students solve mathematical and real-world problems involving three or more of the operations, including complex fractions (7.NS.3).

Level	Basic	Proficient	Advanced
Domain	**Expressions and Equations**		
Range PLD: Cluster C - Use properties of operations to generate equivalent expressions.	Basic students generate equivalent expressions by adding and subtracting integers (7.EE.1);	Proficient students generate equivalent expressions by adding, subtracting, multiplying, and factoring with at least one rational coefficient (7.EE.1);	Advanced students generate equivalent expressions by adding, subtracting, multiplying, and factoring with multiple rational coefficients (7.EE.1);
	Basic students rewrite in different forms, using one operation, an expression in a mathematical context (7.EE.2).	Proficient students rewrite, using two or more operations, an expression in different forms from a contextual problem (7.EE.2).	Advanced students interpret the relationships between expressions (7.EE.2).
Range PLD: Cluster D - Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	Basic students solve two-step mathematical problems consisting of integers (7.EE.3);	Proficient students solve multi-step real-world and mathematical problems consisting of positive and negative rational numbers given in any form (7.EE.3);	
		Proficient students approximate answers to real-world and mathematical problems by estimation (7.EE.3);	Advanced students assess the reasonableness of answers to real-world and mathematical problems by estimation (7.EE.3);
	Basic students solve one-step mathematical problems leading to equations involving integers and two-step mathematical problems leading to equations involving whole numbers (7.EE.4);	Proficient students solve two-step real-world and mathematical problems leading to equations involving rational numbers (7.EE.4);	Advanced students solve real-world and mathematical problems leading to equations involving rational numbers, and use the solution to answer additional questions (7.EE.4);
	Basic students solve one-step and two-step mathematical problems leading to inequalities involving whole numbers (7.EE.4).	Proficient students solve two-step real-world and mathematical problems leading to inequalities involving rational numbers (7.EE.4);	Advanced students solve two-step real-world and mathematical problems leading to inequalities involving rational numbers and use the solution to answer additional questions (7.EE.4).
		Proficient students graph the solution set of an inequality and interpret the meaning of the graph with respect to the problem (7.EE.4).	

Level	Basic	Proficient	Advanced
Domain	**Geometry**		
Range PLD: Cluster E - Draw, construct, and describe geometrical figures and describe the relationships between them.	Basic students compute a single dimension from a scale drawing given an integer scale factor (7.G.1);	Proficient students compute actual lengths from scale drawings and verbal descriptions (7.G.1);	Advanced students identify and reproduce scale drawing(s) at different scales with respect to the dimensions of the actual figure (7.G.1);
	Basic students identify the type of triangle with respect to angle measures and side measures (7.G.2);	Proficient students determine if the three measures of angles or sides meets the condition of a unique triangle, more than one triangle, or no triangle (7.G.2);	
	Basic students determine which two-dimensional figure (cross-section) results from slicing right rectangular prisms given a figure with the cross-section shown (7.G.3).	Proficient students determine which two-dimensional figure (cross-section) results from slicing right rectangular prisms or right rectangular pyramids given a verbal description (7.G.3).	Advanced students determine which two-dimensional figure (cross-section) results from slicing cylinders, cones, or spheres.
Range PLD: Cluster F - Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	Basic students identify expressions that represents the area and circumference of a circle given the dimensions (7.G.4);	Proficient students calculate the area and circumference of a circle (7.G.4);	Advanced students solve for a component part (radius or diameter) given the circumference of a circle (7.G.4);
	Basic students understand the relationship between a pair of supplementary, complementary, or vertical angles (7.G.5);	Proficient students solve equations with two-steps for an unknown angle in a pair of complementary, supplementary, or vertical angles (7.G.5);	Advanced students solve equations with three or more steps for an unknown angle in a pair of complementary, supplementary, or vertical angles (7.G.5);
	Basic students solve real-world and mathematical problems involving the area of a polygon composed of two figures consisting of triangles and rectangles (7.G.6);	Proficient students solve real-world and mathematical problems involving the area of a polygon composed of no more than three figures consisting of triangles and quadrilaterals (7.G.6);	Advanced students solve real-world and mathematical problems involving the area of a figure composed of polygons (7.G.6);
	Basic students solve real-world and mathematical problems involving the volume of a right prism given the area of the base and the height (7.G.6);	Proficient students solve real-world and mathematical problems involving the volume of a solid composed of two right prisms (7.G.6);	Advanced students solve real-world and mathematical problems involving the volume of a solid composed of three or more right prisms (7.G.6);
	Basic students determine the surface area of a right rectangular prism (7.G.6).	Proficient students solve real-world and mathematical problems involving the surface area of a right prism (7.G.6).	Advanced students solve real-world and mathematical problems involving the surface area of a solid composed of right prisms (7.G.6).

Level	Basic	Proficient	Advanced
Domain	**Statistics and Probability**		
Range PLD: Cluster G - Use random sampling to draw inferences about a population.	Basic students identify a statistical question that can be used to sample a population.	Proficient students identify the characteristics of valid random samples and how they produce representative samples and valid inferences about a population (7.SP.1);	Advanced students examine the validity of inferences about a population (7.SP.2);
		Proficient students use data from a random sample to draw generalizations and inferences about a population (7.SP.2).	Advanced students compare multiple random samples of the same size from a population to analyze the variations in the population (7.SP.2).
Range PLD: Cluster H - Draw informal comparative inferences about two populations.	Basic students compare the measures of center of two data sets (7.SP.4).	Proficient students compare two populations with respect to the measures of center and measures of variability (7.SP.4).	Advanced students draw inferences about two populations with respect to the measures of center and measures of variability (7.SP.3, 4).
Range PLD: Cluster I - Investigate chance processes and develop, use, and evaluate probability models.	Basic students describe the probability of a chance event as a number between 0 and 1 (7.SP.5);	Proficient students identify a chance event as an unlikely event, an event that is neither unlikely nor likely, or a likely event given the probability of the chance event as a number between 0 and 1 (7.SP.5);	Advanced students explain the relationships between probability and collected data, including simulations (7.SP.5, 6);
	Basic students determine probabilities of simple probability models (7.SP.7);	Proficient students approximate the probability of an event from collected data (7.SP.7);	Advanced students determine the probability of multiple-event probability models (7.SP.7);
	Basic students determine the sample space from two compound events using lists, tables, and tree diagrams (7.SP.8).	Proficient students determine the probability of compound events consisting of two simple events (7.SP.8).	Advanced students determine the probability of compound events consisting of more than two simple events (7.SP.8).

Level	Basic	Proficient	Advanced
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Domain	**The Number System**		
Range PLD: Cluster A - Know that there are numbers that are not rational and approximate them by rational numbers.	Basic students identify numbers as being rational or irrational (8.NS.1);		
		Proficient students determine the repeating decimal expansion for a rational number and determine the rational number from a repeating decimal expansion (8.NS.1);	
		Proficient students determine that a non-repeating decimal expansion represents an irrational number (8.NS.2).	Advanced students use approximation strategies with rational numbers to identify and compare the estimated values of irrational numbers with respect to a real number line (8.NS.2).

Level	Basic	Proficient	Advanced
Domain	**Expressions and Equations**		
Range PLD: Cluster B - Work with radicals and integer exponents.	Basic students apply the properties of integer exponents with only positive integers involving one operation (8.EE.1);	Proficient students apply the properties of integer exponents with integers to generate equivalent numerical expressions (8.EE.1);	Advanced students apply the properties of integer exponents with integers involving multiple negative exponents (8.EE.1);
	Basic students represent solutions with either square root or cube root symbols for x in the equations $x^2 = p$ and $x^3 = p$ when p is a whole number (8.EE.2);	Proficient students represent solutions with both square root and cube root symbols for x in the equations $x^2 = p$ and $x^3 = p$ when p is a positive rational number (8.EE.2);	Advanced students represent solutions of two-step equations with both square root and cube root symbols for x in the equations $x^2 + a = p$ and $x^3 + a = p$ when a and p are rational numbers and $p - a$ is greater than 0;
		Proficient students evaluate square roots of perfect squares up to 144 and cube roots of perfect cubes up to 1,000 (8.EE.2);	
	Basic students express numbers in scientific notation (8.EE.3).	Proficient students compare or multiply/divide two numbers in scientific notation (8.EE.4);	Advanced students compare or apply the four operations (+, -, x, and ÷) between two or more numbers in scientific notation (8.EE.4).
		Proficient students choose units of appropriate size for measurements of very large or very small quantities in scientific notation (8.EE.4).	
Range PLD: Cluster C - Understand the connections between proportional relationships, lines, and linear equations.	Basic students graph proportional relationships from a table of values (8.EE.5);	Proficient students graph proportional relationships from the equation $y = mx$ (8.EE.5);	Advanced students compare two different proportional relationships represented in different ways (8.EE.5);
		Proficient students interpret the unit rate within context as the slope of the graph (8.EE.5);	Advanced students explain why the slope (m) is equivalent between any two different points located on any non-vertical line in the coordinate plane (8.EE.5);
	Basic students derive the equation $y = mx$ with slope (m) from a graph (8.EE.6).	Proficient students derive the equation $y = mx$ with slope (m) from a table or graph and derive the equation $y = mx + b$ with slope (m) and y-intercept (b) from a table or graph (8.EE.6).	Advanced students derive the equation $y = mx + b$ with slope (m) and y-intercept (b) from a verbal description (8.EE.6).
Range PLD: Cluster D - Analyze and solve linear equations and pairs of simultaneous linear equations.	Basic students solve two-step linear equations in one variable with integer coefficients and constants (8.EE.7);	Proficient students solve linear equations in one variable with integer coefficients and constants that require multi-steps and identify the solution of a linear equation in one variable as infinitely many solutions or no solutions (8.EE.7);	Advanced students solve linear equations in one variable with rational number coefficients and constants that require multi-steps and identify the solution of a linear equation in one variable as infinitely many solutions or no solutions (8.EE.7);
	Basic students identify the solution to a system of two linear equations from a graph as the point of intersection of the two lines (8.EE.8).	Proficient students solve systems of two linear equations in two variables algebraically or graphically (8.EE.8).	Advanced students construct and solve systems of two linear equations which represent real-world or mathematical problems (8.EE.8).

Level	Basic	Proficient	Advanced
Domain	**Functions**		
Range PLD: Cluster E - Define, evaluate, and compare functions.	Basic students evaluate functions with integer coefficients and constants with positive integers as the inputs (8.F.1);	Proficient students evaluate functions with rational coefficients and constants with integers as the inputs (8.F.1);	Advanced students evaluate functions with rational coefficients and constants with rational numbers as the inputs (8.F.1);
		Proficient students identify if a table of values or a graph in the coordinate plane represent a function (8.F.1);	
	Basic students compare the properties of two linear functions represented by graphs (8.F.2);	Proficient students compare the properties of two linear functions represented in different ways (8.F.2);	Advanced students compare the properties of two functions, with at least one non-linear function, which are represented in different ways (8.F.2);
	Basic students identify linear and non-linear functions represented by graphs (8.F.3).	Proficient students identify linear and non-linear functions represented by equations and tables (8.F.3).	Advanced students identify linear and non-linear functions represented by verbal descriptions (8.F.3).
Range PLD: Cluster F - Use functions to model relationships between quantities.	Basic students construct a graph to model a real-world linear relationship between two quantities (8.F.4);	Proficient students create an equation to represent a function which models a real-world linear relationship between two quantities (8.F.4);	Advanced students use the graph and equation representing a function to analyze the relationship between two quantities (8.F.4);
	Basic students determine the rate of change and initial value of a function from a graph (8.F.4);	Proficient students determine the rate of change and initial value of a function from a table (8.F.4);	Advanced students determine the rate of change and initial value of a function from a verbal description (8.F.4);
	Basic students interpret the rate of change and initial value of a real-world linear function in terms of its graph (8.F.4);	Proficient students interpret the rate of change and initial value of a real-world linear function in terms of its graph or table of values (8.F.4);	Advanced students interpret the rate of change and initial value of a real-world linear function in terms of a verbal description (8.F.4);
	Basic students identify graphs of functional relationships as being linear or non-linear (8.F.5).	Proficient students identify and describe the qualitative features from analyzing a linear function (8.F.5).	Advanced students identify and describe the qualitative features from analyzing a non-linear function (8.F.5).

Level	Basic	Proficient	Advanced
Domain	**Geometry**		
Range PLD: Cluster G - Understand congruence and similarity using physical models, transparencies, or geometry software.	Basic students identify the transformations (rotation, reflection, and translation) of figures (8.G.1);	Proficient students describe the effects on lines, line segments, and angles of figures when rotations, reflections, and translations are performed (8.G.1);	
		Proficient students describe the properties of congruency between two figures when at most two transformations are performed (8.G.2);	Advanced students describe the properties of congruency between two figures when three or more transformations are performed (8.G.2);
	Basic students translation is performed on the coordinate plane (8.G.3);	Proficient students identify coordinates when a sequence of rotations, reflections, translations, or dilations are performed in the coordinate plane (8.G.3);	Advanced students explain the sequence of rotations, reflections, translations, and dilations performed on the pre-image to determine the image (8.G.3);
	Basic students identify similarity from a sequence of transformations (8.G.4);	Proficient students describe the properties of similarity between two figures when transformations are performed (8.G.4);	Advanced students describe the property of similarity with triangles when identifying and establishing the Angle-Angle (AA) criterion for the triangles (8.G.5).
	Basic students determine the interior angle measure(s) of a triangle (8.G.5);	Proficient students determine the interior and exterior angle measures of a triangle (8.G.5);	
	Basic students identify the types of angles created when parallel lines are cut by a transversal (8.G.5).	Proficient students determine the measurement of angles or properties of angles that are created when parallel lines are cut by a transversal (8.G.5).	
Range PLD: Cluster H - Understand and apply the Pythagorean theorem.	Basic students apply the Pythagorean Theorem in mathematical problems by setting up the equation $a^2 + b^2 = c^2$ (8.G.7).	Proficient students calculate the unknown side lengths in right triangles in real-world and mathematical problems (8.G.7);	Advanced students explain and identify the proofs of the Pythagorean Theorem and the converse of the Pythagorean Theorem (8.G.6);
		Proficient students calculate the distance between two points on a grid by applying the Pythagorean Theorem (8.G.8).	Advanced students calculate the distance between two points by applying the distance formula.
Range PLD: Cluster I - Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.	Basic students identify the formulas for the volumes of cones, cylinders, and spheres (8.G.9).	Proficient students calculate the volumes of a cone, cylinder, or sphere as a decimal value or in terms of pi (8.G.9).	Advanced students solve for a component part (radius or height) given the volume of a cone, cylinder, or sphere and determine the volume of a composite figure containing two to more cones, cylinders, or spheres (8.G.9).

Level	Basic	Proficient	Advanced
Domain	**Statistics and Probability**		
Range PLD: Cluster J - Investigate patterns of association in bivariate data.	Basic students identify the pattern of association in scatter plots as a positive association, negative association, or no association (8.SP.1);	Proficient students identify the pattern of association as a positive association, negative association, or no association given data in a table and describe characteristics of scatter plots such as clustering, outliers, and linear versus non-linear association (8.SP.1);	Advanced students identify the pattern of association given a verbal description as a positive association, negative association, or no association (8.SP.1);
		Proficient students identify a line of best fit for scatter plots (8.SP.2);	Advanced students graph a curve of best fit for scatter plots;
	Basic students use the equation of a linear model in the context of data to identify slope and intercepts (8.SP.3);	Proficient students use the equation of a linear model in the context of data to interpret the meaning of the slope and intercepts (8.SP.3);	Advanced students use the data in a scatter plot to create an equation of a line of best fit (8.SP.3);
	Basic students identify values from a two-way table (8.SP.4).	Proficient students interpret the data numerically in a two-way table (8.SP.4).	Advanced students justify conclusions about the frequencies and relative frequencies of data in a two-way table (8.SP.4).