GRADE 3 MATH

WY-TOPP 2018+ Performance Level Descriptors

Level	Below Basic	Basic	Proficient	Advanced
Policy PLDs **(Performance Level Descriptors)** General descriptors that provide overall claims about a student's performance in each performance level; used to broadly articulate the goals and rigor for the state's performance standards.	Students performing at below basic level in Mathematics have minimal or no academic performance indicating understanding and little display of the knowledge and skills included in the Wyoming Content and Performance Standards.	Students performing at the basic level in Mathematics have 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.	Students performing at the proficient level in Mathematics have satisfactory academic performance indicating a solid understanding and display of the knowledge and skills included in the Wyoming Content and Performance Standards.	Students performing at the advanced level in Mathematics have superior academic performance indicating an in-depth understanding and exemplary display of the knowledge and skills included in the Wyoming Content and Performance Standards.

Range PLDs

Describes the expectations for students across each standard and proficiency level; reflects the knowledge, skills, and processes that are expected of students.

Reporting Category / Domain		Operations and Algebraic Thinking			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster A - Represent and solve problems involving multiplication and division.	3.OA.1	interpret products of single-digit whole numbers (using factors up to 5), with support.	interpret products of whole numbers (2, 5, 10) using a pictorial representation.	interpret products of whole numbers in mathematical problems.	write products-in mathematical and real-world contexts.
	3.OA.2	interpret whole-number quotients of whole numbers (with a divisor up to 5), with support.	interpret whole-number quotients of whole numbers (with divisors of 2, 5, 10) using a pictorial representation.	interpret quotients of whole-number division problems using equal groups of objects, arrays of objects in mathematical problems.	write quotients of whole-number division problems, in mathematical and real-world contexts.

Reporting Category / Domain		Operations and Algebraic Thinking (cont.)			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster A (cont.) Represent and solve problems involving multiplication and division.	3.OA.3	use multiplication within 100 to solve word problems involving equal groups and arrays when a visual model is given (with factors	use multiplication within 100 to solve and represent word problems provided a pictorial representation.	use multiplication and division within 100 to solve and represent word problems provided a pictorial representation.	use multiplication and division within 100 to solve and represent real-world contexts.
	3.OA.4	determine the product or quotient in an equation when given the factor is less than or equal to 5.	determine the product or quotient in an equation given one of the factors to be 2, 5, or 10.	determine the unknown whole number in a multiplication or division equation given the other two facts.	interpret two or more equations each with an unknown number in a multiplication or division equation.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster B - Understand properties of multiplication and the relationship between multiplication and division.	3.OA.5	recognize the commutative property of multiplication.	use the commutative property of multiplication to find the product of familiar numbers, e.g. 1, 2, 5, and 10.	use the associative and distributive properties to multiply two or more numbers.	create a problem using the associative and/or distributive properties to multiply numbers.
	3.OA.6	use multiplication to find a missing factor in a division equation, with support.	use multiplication to find a missing factor in a division equation.	use division to find a missing factor in a multiplication equation.	use division to find unknown factors given a verbal context.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster C - Multiply and divide within 100.	3.OA.7	multiply and divide single-digit numbers using a variety of strategies and supports.	multiply with factors of 2, 5, and 10 and divide with divisors of 2 or 5 within 50.	fluently multiply and divide two numbers within 100 with one factor greater than 10 and one factor less than 10.	fluently multiply and divide two numbers within 100.

Reporting Category / Domain		Operations and Algebraic Thinking (cont.)			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster D - Solve problems involving the four operations and identify and explain patterns in arithmetic.	3.OA.8	solve two-step word problems using addition and subtraction with simple context and concrete objects or visual representations.	solve two-step word problems involving only addition and subtraction.	solve and represent as an equation a two-step mathematical problem involving the four operations and assess the reasonableness of answers.	solve and represent as an equation a two-step real-world problem involving the four operations and assess the reasonableness of answers.
	3.OA.9	identify additive patterns using visual supports, such as an addition table.	predict the next term of a pattern described by an addition rule.	predict any term of a pattern and create a rule to describe the pattern.	identify a characteristic of a pattern that is not explicitly given.
Reporting Category / Domain		**Number and Operations-Base Ten**			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster E - Use place value understanding and properties of arithmetic to perform multi-digit arithmetic.	3.NBT.1	round to the nearest 10, with support.	round to the nearest 10.	round to the nearest 100.	round to the nearest 1,000.
	3.NBT.2	add/subtract numbers within 100 using visual models or support.	add/subtract within 100.	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.	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.3	multiply one digit whole numbers (2 or 5) by multiples of 10, with support.	multiply one digit whole numbers (2 or 5) by multiples of 10.	multiply one digit whole numbers by multiples of 10 in the range of 10-90.	multiply 2-digit whole numbers (less than 20) by multiples of 10.

Reporting Category / Domain		Number and Operations-Fractions			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster F - Develop understanding of fractions as numbers.	3.NF.1	identify the numerator or denominator.	identify a fraction in the form of a/b given a and b.	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.	represent either a fractional model or a fraction as the sum of unit fractions.
	3.NF.2	identify and represent fractions with denominators of 2 or 4 on a number line, with support.	identify and represent fractions with denominators of 2 or 4 on a number line.	identify and represent fractions with denominators of 3, 6, or 8 on a number line.	explain that each part on a number line has a size of 1/b and that each interval has the same size.
	3.NF.3a-b	identify a fraction on the number line.	identify two fractions as equivalent provided a model or point(s) on a number line.	explain equivalent fractions provided a model or point(s) on a number line.	create models that identifies fractions as equivelant and not equivelant.
	3.NF.3c	identify a fraction in the form a /a that is equivalent to 1, with support.	identify a fraction in the form a/a that is equivalent to 1.	express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers.	write a verbal description to explain whole numbers as fractions and fractions that are equivalent to whole numbers.
	3.NF.3d	recognize two fractions with a common numerator or denominator provided a model of each fraction.	compare, using words, two fractions with a common numerator or denominator provided a model of each fraction.	given a model, compare two fractions with a common numerator or denominator using the symbols (<, >, or =).	create a model that shows the comparison of two fractions with common numerators or denominators.

Reporting Category / Domain		Measurement and Data			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster G - Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.	3.MD.1	identify the time from an analog/digital clock to the nearest five minutes, with support.	identify the time from an analog/digital clock to the nearest five minutes.	solve real-world or mathematical problems with addition/subtraction involving elapsed time to the nearest minute.	solve addition/subtraction real-world or mathematical problems of elapsed time involving "regrouping".
	3.MD.2	estimate liquid volumes and masses of objects using models.	solve one-step problems involving liquid volumes and masses using addition and subtraction.	estimate and solve one-step problems involving liquid volumes and masses using the four operations.	solve one-step problems involving liquid measures and masses using the four operations requiring reading a measurement off of a scaled measurement tool.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster H - Represent and interpret data.	3.MD.3	read data from a picture graph or bar graph, with support.	read data from a picture graph or bar graph.	interpret data from a picture graph or bar graph and solve problems.	compare data from a picture graph or bar graph to solve multi-step problems.
	3.MD.4	identify an appropriate line plot using only whole numbers given data, with support.	identify an appropriate line plot using only whole numbers given data.	generate measurement data by measuring lengths to the nearest half- and quarter-inch. Shows the data by making a line plot, where the horizontal scale is marked in appropriate units (whole number, halves or quarters).	create a line plot using a fraction scale.

Reporting Category / Domain		Measurement and Data			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster I - Geometric measurement: understand the concepts of area and relate area to multiplication and to addition.	3.MD.5 & 6	recognize what a square unit is in a plane figure and can be covered without gaps or overlaps to find an area.	recognize that a square labeled with 1 square unit can be used to measure area.	determine the area of a rectangle by counting unit squares in a tiled rectangle.	find the area of 2 plane figures by counting the square units and compares their sizes.
	3.MD.7a-b	find the area of a rectangle by tiling.	find the area of a rectangle by tiling and show that the area is the same as would be found by multiplying the side lengths.	determine the area of a rectangle by multiplying length times width in both mathematical and real-world contexts.	solve for the side of a rectangle by dividing the area by the other side; use area models to show that a(b+c)= (axb)+(axc).
	3.MD.7c-d	find the area of two rectangles by tiling.	recognize that two rectangles can fit into a larger rectangle.	solve for the area of a figure by decomposing the figure into two non-overlapping rectangles.	solve for the area of a figure by decomposing the figure into three or more non-overlapping rectangle.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD J - Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	3.MD.8	solve for the perimeter of a polygon given all of the side lengths, with support.	solve for the perimeter of a polygon given all of the side lengths.	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.	compare the perimeters and areas of rectangles.
Reporting Category / Domain		**Geometry**			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster K - Reason with shapes and their attributes.	3.G.1	identify a rectangle or square.	identify a rectangle or square as a quadrilateral.	identify a category for a quadrilateral given its attributes.	compare two or more quadrilaterals according to their shared attributes.
	3.G.2	identify a figure partitioned into equal parts and represent each part as a unit fraction (limited to halves and quarters).	identify a figure partitioned into equal parts and represent each part as a unit fraction (limited to halves, quarters, and eighths).	identify a figure partitioned into equal parts and represent each part as a unit fraction.	compare partitioned figures.

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Range PLDs

Describes the expectations for students across each standard and proficiency level; reflects the knowledge, skills, and processes that are expected of students.

Reporting Category / Domain		Operations and Algebraic Thinking			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster A - Use the four operations with whole numbers to solve problems.	4.OA.1	recognize that any two factors and their product can be read as a comparison, with support.	identify multiplicative comparisons involving equal groups and arrays using multiplication symbols.	interpret equations involving multiplicative comparisons using either multiplication or division symbols.	generate equations involving multiplicative comparisons using either multiplication or division symbols.
	4.OA.2	solve one-step problems involving multiplicative comparisons in mathematical contexts, with support.	solve one-step problems involving multiplicative comparisons in mathematical contexts.	solve one-step problems involving multiplicative comparisons in both mathematical and real-world contexts.	solve real-world problems and explain answers.
	4.OA.3a	solve one-step problems involving addition and subtraction.	solve one-step problems involving all four operations (+, -, x, and ÷) in both mathematical and real-world contexts.	solve two-step problems involving all four operations (+, -, x, and ÷) in both mathematical and real-world contexts.	solve three-step problems involving all four operations (+, -, x, and ÷) in both mathematical and real-world contexts.
	4.OA.3b	determine if two whole numbers divide evenly using manipulatives.	determine if two whole numbers divide evenly.	determine the remainder when two whole numbers are divided.	interpret the meaning of a remainder when two whole numbers are divided and the reasonableness of answers using estimation strategies.

Reporting Category / Domain		Operations and Algebraic Thinking (cont.)			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster B - Gain familiarity with factors and multiples.	4.OA.4a	recognize that a whole number is a multiple of each of its factors.	determine one multiple for a whole number in the range of 1-100.	determine if a whole number in the range of 1-100 is a multiple of a 1-digit number.	determine if a whole number is a multiple of 11, 12, or 15.
	4.0A.4b	determine all factor pairs for a whole number in the range of 1-10.	determine all factor pairs for a whole number in the range of 1-20.	determine all factor pairs for a whole number in the range of 1-100 and if the whole number is prime or composite.	determine all factor pairs for a whole number in the range of 1-1000 and if the whole number is prime or composite.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster C - Generate and analyze patterns.	4.OA.5	recognize a number or shape pattern that follows a given rule, using visual models.	predict a term in a pattern.	generate a pattern involving an addition or a subtraction rule and predict a term in a number pattern.	generate a pattern involving multiplication and predict a term in a number pattern. Identify features of the terms of a pattern that are not explicitly given in the rule.
Reporting Category / Domain		**Number and Operations-Base Ten**			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster D - Generalize place value understanding for multi-digit whole numbers.	4.NBT.1	recognize that a digit in the tens place is a multiple of 10 with visual representation.	recognize that a digit in the tens place is a multiple of 10.	recognize that a digit in one place represents 10 times what the same digit represents in the place to the right.	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.2a	read and write multi-digit whole numbers up to 1,000.	read and write multi-digit whole numbers up to 10,000.	read and write multi-digit whole numbers up to 1,000,000.	read and write multi-digit whole numbers up to 100,000,000.
	4.NBT.2b	compare two multi-digit whole numbers up to 100 based on the meaning of the digits in each place using <, >, and =.	compare two multi-digit whole numbers up to 1,000 based on the meaning of the digits in each place using <, >, and =.	compare two multi-digit whole numbers up to 1,000,000 based on the meaning of the digits in each place using <, >, and =.	explain how to use the digits in multi-digit whole numbers to compare numbers up to 1,000,000.
	4.NBT.3	use place value understanding to round multi-digit whole numbers to any place within 1,000.	round any multi-digit whole number up to 10,000 to any place.	round any multi-digit whole number up to 1,000,000 to any place.	explain how to use the digits in multi-digit whole numbers to round numbers up to 1,000,000.

Reporting Category / Domain		Number and Operations-Base Ten (cont.)			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster E - Use place value understanding and properties of operations to perform multi-digit arithmetic.	4.NBT.4	add or subtract two or more numbers whose sum or difference is less than 100 using the standard algorithm without regrouping.	add or subtract two or more numbers whose sum or difference is less than 1,000 using the standard algorithm.	add or subtract two or more numbers whose sum or difference is less than 1,000,000 using the standard algorithm.	add or subtract two or more numbers whose sum or difference is greater than 1,000,000 using the standard algorithm.
	4.NBT.5	multiply a two-digit number by a one digit number using strategies based on place value, properties of operations, or models.	multiply a three-digit number by a one-digit number using strategies based on place value, properties of operations, or models.	multiply up to a four-digit number by a one-digit number using strategies based on place value, properties of operations, or models.	multiply a two-digit number by a two-digit number using strategies based on place value, properties of operations, or models.
	4.NBT.6	find whole number quotients and remainders (with two-digit dividends and single-digit divisors), using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division, or models.	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.	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.	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.
Reporting Category / Domain		**Number and Operations-Fractions**			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster F - Extend understanding of fraction equivalence and ordering.	4.NF.1	identify equivalent fractions with unlike denominators, with support.	identify equivalent fractions with unlike denominators.	explain and generate equivalent fractions with unlike denominators.	justify why two fractions are equivalent.
	4.NF.2	compare two fractions with different numerators or different denominators by using simple fractions, with support.	compare two fractions with different numerators or different denominators by using simple fractions.	compare two fractions with different numerators and denominators using the symbols <, >, or = .	justify how and when valid fractional comparisons can be made.

Reporting Category / Domain		Number and Operations-Fractions			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster G - Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	4.NF.3a-b	recognize a fraction as a sum of unit fractions.	interpret a fraction as a sum of unit fractions.	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.	use properties of operations and inverse operations to add or subtract two fractions with like denominators including mixed numbers.
	4.NF.3c	convert a mixed number into an equivalent fraction, with support.	convert mixed numbers into equivalent fractions.	represent addition and subtraction of mixed numbers, put into equivalent fractions, with like denominators.	identify and represent addition and subtraction of fractions with like denominators in multiple ways.
	4.NF.3d	solve one-step problems involving addition and subtraction of fractions (referring to the same whole and having like denominators of 2, 3, 4, 6, or 8) with visual fraction models.	solve one-step problems involving addition or subtraction of fractions with like denominators in mathematical contexts.	solve one-step problems involving addition or subtraction of fractions with like denominators in real-world context.	solve two-step problems involving addition or subtraction of fractions with like denominators in mathematical or real-world contexts.
	4.NF.4a-c	multiply 2 by a fraction (doubling) using visual fraction models, with support.	multiply 2 by a fraction (doubling).	multiply a whole number times a fraction in the form a/b in both mathematical and real-world contexts.	generalize the multiplication of a whole number and a fraction as nx (a/b)=(nx a)/b.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster H - Understand decimal notation for fractions, and compare decimal fractions.	4.NF.5	express, using a fraction with denominator 10 as an equivalent fraction with denominator 100 by using a model.	add two fractions with respective denominators 10 and 100 by first finding equivalent fractions with like denominators by using a model.	generate equivalent fractions with denominators of 10 and 100 and ~~to~~ add these fractions.	solve missing addend problems with respective denominators 10 and 100 by first finding equivalent fractions with like denominators.
	4.NF.6	write decimal notation for fractions with a denominator of 10, with support.	write decimal notation for fractions with denominators of 10 or 100, with support.	write in decimal form, fractions with denominators of 10 or 100.	justify why two decimals are equivalent.
	4.NF.7	compare two decimals of the same place value (tenths or hundredths), with support.	compare two decimals of the same place value using the symbols <, >, or =.	compare two decimals to hundredths using the symbols <, >, or =.	justify how and when a valid decimal comparison can be made.

Reporting Category / Domain		Measurement and Data			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster I - Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	4.MD.1	recognize the relative sizes of units of measure within one system, with support.	recognize the relative sizes of units of measure within one system.	express measurements within either the metric or customary systems in a larger unit in terms of a smaller unit.	in a real-world context, determines the appropriate unit and expresses the measurement to the level of accuracy needed.
	4.MD.2	solve one-step problems involving measurements requiring no conversions using addition or subtraction, with support.	solve one-step problems involving measurements requiring no conversions using addition or subtraction.	solve one-step problems involving measurements requiring conversions using the four operations.	solve multi-step problems involving measurements requiring conversions using the four operation.
	4.MD.3	solve for the area or perimeter of a rectangle given a drawing with all four measurements.	solve for the area and perimeter of a rectangle given a drawing with all four measurements.	solve for the area and perimeter of a rectangle given its length and width in both mathematical and real-world contexts.	solve for the length or width a of a rectangle given its area or perimeter in both mathematical and real-world contexts.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster J - Represent and interpret data.	4.MD.4	identify a line plot that displays a set of data involving fractional measurements (1/2 or 1/4), with support.	identify a line plot that displays a set of data involving fractional measurements (1/2, 1/4, or 1/8).	solve problems involving addition and subtraction of fractions (1/2, 1/4, or 1/8) based on data in a line plot.	gather measurement data, plot this data on a line plot, and solve problems involving addition and subtraction of fractions.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster K - Geometric measurement: understand concepts of angles and measure angles.	4.MD.5 & 6	identify angles as the intersection of two rays.	understand that angles are measured in reference to a circle, and can measure angles in whole number degrees using a protractor.	identify the relationship between an angle measure and a circle in which the vertex of the angle is the center of the circle.	explain the relationship between angle measure and a circle in which the vertex of the angle is the center of the circle.
	4.MD.7	identify angles with a specified measure, with support.	identify angles with a specified measure.	solve one-step addition and subtraction problems to find unknown angles on a diagram in mathematical or real-world contexts.	solve multi-step addition and subtraction problems to find unknown angles on a diagram in mathematical or real-world context.

Reporting Category / Domain		Geometry			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster L - Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	4.G.1	identify stand-alone points, lines, line segments, rays, and classify angles (right, acute, obtuse).	classify/identify lines, angles (right, acute, obtuse), and simple two-dimensional figures.	draw and identify lines, segments, rays, angles (right, acute, obtuse), perpendicular and parallel lines on a figure.	create a two-dimensional shape when given specific attributes.
	4.G.2	identify two-dimensional figures, including right triangles.	classify/identify lines, angles, two dimensional figures, and right triangles.	use parallel lines, perpendicular lines, and angles (acute, obtuse, and right) to classify two-dimensional figures including right triangles.	construct two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of specified size; identifies triangle.
	4.G.3	identify line-symmetric regular figures.	identify line-symmetric figures and identify lines of symmetry for regular two-dimensional figures.	identify line-symmetric figures and draw lines of symmetry.	construct a figure with a given number of lines of symmetry.

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Range PLDs

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Reporting Category / Domain		Operations and Algebraic Thinking			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster A - Write and interpret numerical expressions.	5.OA.1	evaluate one-step numerical expressions.	evaluate two-step numerical expressions with no grouping symbols.	evaluate numerical expressions that use one type of grouping symbol to complete the simplification of numerical expressions.	evaluate numerical expressions that use two or more types of grouping symbols to complete the simplification of numerical expressions.
	5.OA.2	write a numerical expression, using one operation, from a written statement (e.g., divide 144 by 12).	write numerical expressions without grouping symbols.	write numerical expressions that use one type of grouping symbol.	write numerical expressions that use two or more types of grouping symbols.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster B - Analyze patterns and relationships.	5.OA.3	recognize ordered pairs on the coordinate plane given the ordered pairs of a numeric pattern.	graph the ordered pairs on the coordinate plane given the ordered pairs of a numeric pattern.	generate the corresponding terms and identify relationships between the corresponding terms, given two rules.	identify and explain features between the corresponding terms of two numerical patterns not explicitly given in the rule.

Reporting Category / Domain		Number and Operations-Base Ten			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster C - Understand the place-value system.	5.NBT.1	recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right with visual representation.	recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right.	recognize in a multi-digit number, a digit in one place can represent a multiple of 10 times the digit to its right, and 1/10 of what it represents in the place to its left.	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.2	recognize a pattern of a number multiplied by a power of 10.	continue a pattern of a number multiplied by a power of 10.	explain patterns in the number of zeros of the product when a number is multiplied by a power of 10.	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.3a	read and write decimal numbers to tenths.	read and write decimal numbers to hundredths.	read and write decimal numbers to thousandths.	read and write decimal numbers past the thousandths place.
	5.NBT.3b	compare two decimal numbers to tenths using the symbols >, =, and < to record the results of comparisons.	compare two decimal numbers to hundredths using the symbols >, =, and < to record the results of comparison.	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.	compares and order decimals to the thousandths place (with varying place values), from least to greatest or vice versa.
	5.NBT.4	round decimals to the nearest tenth.	round decimals to the nearest hundredth.	round decimals to any place.	Explain how to round decimals to any place.

Reporting Category / Domain		Number and Operations-Base Ten (cont.)			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster D - Perform operations with multi-digit whole numbers and with decimals to the hundredths.	5.NBT.5	multiply a multi-digit whole number by a single-digit whole number using the standard algorithm, with support.	multiply a multi-digit whole number by a single-digit whole number using the standard algorithm.	multiply a multi-digit whole number by a two-digit whole number using the standard algorithm.	multiply multi-digit whole numbers by whole numbers with three or more digits using the standard algorithm.
	5.NBT.6	determine a whole number quotient of a dividend with up to two digits and a one-digit divisor involving whole numbers.	determine a whole number quotient of a dividend with up to three digits and a one-digit divisor involving whole numbers.	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.	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.7	add and subtract decimals to the tenths using concrete models.	add and subtract decimals to the hundredths using concrete models.	use the four operations with decimals to the hundredths using concrete models.	use the four operations with decimals to the hundredths using concrete models and justifying why a method is appropriate.
Reporting Category / Domain		**Number and Operations-Fractions**			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster E - Use equivalent fractions as a strategy to add and subtract fractions.	5.NF.1	add and subtract proper fractions with like denominators.	add and subtract proper fractions with unlike denominators.	add and subtract mixed numbers with unlike denominators that require regrouping by replacing the given fractions with equivalent fractions.	add and subtract three mixed numbers with unlike denominators that require regrouping by replacing the given fractions with equivalent fractions.
	5.NF.2	solve one-step mathematical problems involving addition and subtraction of fractions referring to the same whole, including cases of like denominators, with support.	solve one-step mathematical problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators.	solve multi-step mathematical word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators.	Solve real-world problems involving addition or subtraction with at least 3 or more fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

Reporting Category / Domain		Number and Operations-Fractions (cont.)			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster F - Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	5.NF.3	use manipulatives or visual models to solve problems involving division of whole numbers, leading to answers in the form of fractions or mixed numbers.	identify a fraction written as the quotient of a numerator divided by a denominator in a mathematical context.	solve both mathematical and real-world problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.	creates own model to demonstrate division of fractions.
	5.NF.4a	show the product of a fraction by a whole number by repeated addition, using visual fraction models.	multiply a fraction by a whole number.	multiply a fraction by a fraction.	explain how to multiply a fraction by a fraction.
	5.NF.4b	solve for the area of a rectangle with sides represented by whole numbers by multiplying.	solve for the area of a rectangle with sides represented by a whole number and a fraction by multiplying.	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.	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.5a-b	interpret multiplication scaling by comparing the size of a product to the size of one factor on the basis of the size of the second factor, without performing the indicated multiplication (where both factors are whole numbers).	interpret multiplication scaling by comparing the size of a product to the size of one factor on the basis of the size of the second factor, without performing the indicated multiplication (where one factor is a fraction less than one).	interpret multiplication scaling by comparing the size of a product to the size of one factor on the basis of the size of the second factor, without performing the indicated multiplication, focusing on one factor being a fraction greater than or lesser than one.	predict the result of multiplying a whole number by a fraction less than one, by a fraction greater than one and predict the sizes of the factors based on the product without performing the indicated multiplication.
	5.NF.6	solve real-world problems by multiplying a whole number by a fraction by using visual fraction models to represent the problem (limited to fractions with single-digit numerators or denominators).	solve real-world problems by multiplying a whole number by a fraction.	solve real-world problems involving multiplication of fractions including mixed numbers.	solve multi-step real-world problems involving multiplication of fractions including mixed number.

	5.NF.7	solve for the quotient of a whole number divided by a unit fraction given a model, with support.	solve for the quotient of a whole number divided by a unit fraction given a model.	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.	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.
Reporting Category / Domain		**Measurement and Data**			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster G - Convert like measurement units within a given measurement system.	5.MD.1	convert among different-sized standard measurement units within a given measurement system, with support.	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.	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.	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.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster H - Represent and interpret data.	5.MD.2	identify a line plot representing a data set with measurements in fractions of a unit (1/2 and 1/4).	identify a line plot representing a data set with measurements in fractions of a unit (1/2, 1/4, 1/8).	use one or two operations with fractions to solve problems involving information presented in line plots.	use three or more operations with fractions to solve problems involving information presented in line plots.

Reporting Category / Domain		Measurement and Data (cont.)			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster I - Geometric measurement: understand concepts of volume and relate volume to multiplication and addition.	5.MD.3	define a unit cube.	use unit cubes to find the volume of rectangular prisms with whole-number edges (limited to single-digit dimensions).	determine volumes by counting improvised units.	use the associative property of multiplication to represent threefold whole number products as volumes.
	5.MD.4	determine the volume of a rectangular prism by counting the number of unit cubes in a rectangular prism, with support.	determine the volume of a rectangular prism by counting the number of unit cubes in a rectangular prism.	show that counting unit cubes to find the volume of a rectangular prism is the same as multiplying the edge lengths of the prism.	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.5a-b	solve volume problems of a right rectangular prism by using unit cubes.	apply the formula V = l × w × h to find volumes of right rectangular prisms given whole number edge lengths.	apply the formula V = l × w × h to find volumes of right rectangular prisms with whole number edge lengths in both mathematical and real-world contexts.	apply the formula V = b× h to find volumes of right rectangular prisms with whole number edge lengths in both mathematical and real-world contexts.
	5.MD.5c	add two volumes to solve a problem using unit cubes.	add two volumes to solve a problem.	add two volumes to solve real-world problems.	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.

Reporting Category / Domain		Geometry			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster J - Graph points on the coordinate plane to solve real-world and mathematical problems.	5.G.1	identify the components of a coordinate system, with support.	name the components of a coordinate system.	describe the components of a coordinate system and understand the use of a coordinate system (1st Quadrant only).	name, use, and describe the components of a coordinate system (1st Quadrant only).
	5.G.2	locate a point in the first quadrant using an ordered pair, with support.	locate a point in the first quadrant using an ordered pair.	represent both mathematical and real-world contexts by graphing points in the first quadrant of the coordinate plane.	interpret coordinate values of points in the context of the situation.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster K - Classify two-dimensional figures into categories based on their properties.	5.G.3 & 4	identify two-dimensional figures based on properties limited to sides and angles.	classify two-dimensional figures into basic subcategories.	classify two-dimensional figures in a hierarchy based on properties.	evaluate simple logical arguments to show that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

Level	Below Basic	Basic	Proficient	Advanced
Policy PLDs **(Performance Level Descriptors)** General descriptors that provide overall claims about a student's performance in each performance level; used to broadly articulate the goals and rigor for the state's performance standards.	Students performing at below basic level in Mathematics have minimal or no academic performance indicating understanding and little display of the knowledge and skills included in the Wyoming Content and Performance Standards.	Students performing at the basic level in Mathematics have 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.	Students performing at the proficient level in Mathematics have satisfactory academic performance indicating a solid understanding and display of the knowledge and skills included in the Wyoming Content and Performance Standards.	Students performing at the advanced level in Mathematics have superior academic performance indicating an in-depth understanding and exemplary display of the knowledge and skills included in the Wyoming Content and Performance Standards.

Range PLDs

Describes the expectations for students across each standard and proficiency level; reflects the knowledge, skills, and processes that are expected of students.

Reporting Category / Domain		Ratios and Proportional Relationships			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster A - Understand ratio concepts and use ratio reasoning to solve problems.	6.RP.1	identify a ratio using one symbol or basic language notation.	write a ratio relationship between two quantities.	describe a ratio relationship between two quantities, including comparing one of the quantities to the total.	uses and makes connections between different representations for ratio situations. For example, 7 blue marbles and 8 red marbles.
	6.RP.2	identify unit rates.	write a unit rate to describe two quantities using whole numbers.	write a unit rate to describe two quantities using rational numbers and use unit rate language to describe two quantities.	explain the concept of a unit rate using unit rate language.
	6.RP.3a	find missing values in a table.	make a table of equivalent ratios relating quantities with whole number measurements.	make tables of equivalent ratios relating quantities with whole number measurements and plot the pairs of values on the coordinate plane.	create and solve real-world word problems using ratio and rate reasoning.
	6.RP.3b	identify unit rate.	solve unit rate problems given the unit rate.	solve unit rate problems that require determining a unit rate.	solve unit rate problems that require determining two unit rates.

(cont.) **Range PLD: Cluster A -** Understand ratio concepts and use ratio reasoning to solve problems.	6.RP.3c	know the meaning of percent of a quantity as a rate per hundred.	solve for a percent of a quantity given the whole of 10 or 100.	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.	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.3d	identify ratio relationships using measurement units within the same system.	use ratio reasoning to convert measurement units within the same system.	use ratio reasoning to convert measurement units and to transform units appropriately when multiplying or dividing quantities.	use ratio reasoning to convert measurement units and transform units appropriately when multiplying and dividing in a real-world context.
Reporting Category / Domain		**The Number System**			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster B - Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	6.NS.1	solve problems in mathematical contexts involving division of a whole number by a unit fraction.	compute quotients of a fraction by a unit fraction. Students solve problems in mathematical contexts involving division of a fraction by a unit fraction.	compute quotients of any two fractions including mixed numbers. Students solve problems in mathematical contexts involving division of fractions by fractions.	interpret quotients of fractions by identifying real-world contexts.
	6.NS.2	divide two-digit dividends by one-digit divisors using the standard algorithm.	divide three-digit or four-digit dividends by two-digit divisors using the standard algorithm.	divide multi-digit numbers with fractional remainders using the standard algorithm.	divide multi-digit numbers with fractional remainders using the standard algorithm, and explain the reasonableness of the result.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster C - Compute fluently with multi-digit numbers and find common factors and multiples.	6.NS.3	add, subtract, multiply, or divide decimals to tenths using the standard algorithms, with support.	add, subtract, multiply, or divide decimals to tenths using the standard algorithms.	add, subtract, multiply, or divide decimals to hundredths using the standard algorithms.	add, subtract, multiply, or divide decimals to thousandths using the standard algorithms for each operation.
	6.NS.4	determine the greatest common factor of two whole numbers less than or equal to 20 using a visual model or strategies.	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.	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.	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.

Reporting Category / Domain		The Number System (cont.)			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster D - Apply and extend previous understandings of numbers to the system of rational numbers.	6.NS.5	place integers on the number line (with whole-number increments), extending the counting pattern to integers.	place integers on the number line. In a given situation (e.g., elevation, sea level), student is able to determine the meaning of zero.	represent quantities in real-world contexts using rational numbers; do simple applications involving positive and negative numbers.	recognizes patterns and makes generalizations about characteristics of positive and negative numbers in real-world contexts. (may use any rational number, including fractions and decimals)
	6.NS.6a	represent an integer on a horizontal number line.	represent a rational number on a horizontal number line.	represent two or more rational numbers on a horizontal number line.	order a set of rational numbers.
	6.NS.6b-c	plot integer pairs in the first quadrant of a coordinate plane (with one-unit increments on both axes).	graph ordered pairs of integers in the first quadrant of a coordinate plane.	graph ordered pairs in all four quadrants of a coordinate plane.	identify the quadrant a point lies in given descriptions of its coordinates with real-world context.
	6.NS.7a-b	compare a positive and a negative integer on a number line.	compare a positive and a negative rational number.	order rational numbers.	interpret and explain statements of order for rational numbers in real-world contexts.
	6.NS.7c-d	distinguish the absolute value symbol from other mathematical notations.	understand that absolute value of a rational number is its distance from 0 on the number line.	determine the absolute value of a rational number by explaining its distance from 0 on the number line in real-world contexts.	determine when it is appropriate to use the absolute value of a rational number in a real-world context.
	6.NS.8	use coordinates to find distances between points with the same first coordinate or the same second coordinate in the first quadrant, with support.	use coordinates to find distances between points with the same first coordinate or the same second coordinate in the first quadrant.	use coordinates to find distances between points with the same first coordinate or the same second coordinate in all four quadrants.	use coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate in all four quadrants.

Reporting Category / Domain		Expressions and Equations			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster E - Apply and extend previous understandings of arithmetic to algebraic expressions.	6.EE.1	recognize exponential notation as repeated multiplication.	write and evaluate one-step numerical expressions involving one whole number exponent.	write and evaluate multi-step numerical expressions involving whole number exponents.	write and evaluate numerical multi-step expressions involving the distributive property and whole number exponents.
	6.EE.2a	identify an expression that matches a written statement, with numbers and with letters standing for numbers, using correct mathematical terms.	write and read one-step expressions with rational numbers with variables.	write and read two-step expressions with rational numbers with variables.	write and read three-step or four-step expressions with rational numbers with variables.
	6.EE.2b-c	identify parts of an expression using mathematical language.	evaluate expressions at specific values of their variables.	evaluate expressions at specific values of their variables, and include expressions that arise from formulas used in real-world problems.	evaluate multi-step, real-world problems involving rational numbers and whole-number exponents.
	6.EE.3 & 4	identify the properties of operations.	apply the properties of operations to identify equivalent expressions based on the commutative property.	apply the properties of operations to identify and generate equivalent expressions.	explain why two expressions are equivalent.

Reporting Category / Domain		Expressions and Equations (cont.)			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster F - Reason about and solve one-variable equations and inequalities.	6.EE.5	use substitution to determine whether a given whole number in a specified set makes a one-step equation true.	use substitution to determine whether a given whole number in a specified set makes a one-step equation or a one-step inequality true.	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.	use substitution to determine whether a given rational number in a specified set makes a two-step equation or a two-step inequality true.
	6.EE.6	identify a variable representing an unknown number.	understand that a variable represents an unknown number.	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.	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.
	6.EE.7	solve equations of the form x + p = q or x - p = q for cases in which p , q and x are all whole numbers with visual models and support.	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.	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.	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.8	recognize the value on an inequality of the form x > c or x < c on number line diagrams.	write an inequality of the form x > c or x < c to represent a mathematical context.	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.	write an inequality of the form x ≥ c or x ≤ c to represent real world contexts, recognize that inequalities of the form x ≥ c or x ≤ c have infinitely many solutions, and represent and interpret solutions of inequalities of the form x ≥ c or x ≤ c on number line diagrams.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster G - Represent and analyze quantitative relationships between dependent and independent variables.	6.EE.9	recognize the apparent relationship between the values of two variables given in a table.	describe in words the apparent relationship between the values of two variables given in a table.	write equations to represent the apparent relationship between the values of two variables given in a table or a graph.	analyze the relationship between the dependent and independent variables using graphs and tables and relate these to the equation.

Reporting Category / Domain		Geometry			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster H - Solve real-world and mathematical problems involving area, surface area, and volume.	6.G.1	determine the area of right triangles that have been composed into rectangles.	determine the area of right triangles by composing into rectangles in both mathematical and real-world contexts.	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.	find a missing dimension given the area of a triangle or a special quadrilateral and all but one dimension.
	6.G.2	apply the formulas V = lwh to find volumes of right rectangular prisms with whole number edge lengths.	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.	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 context.	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.3	draw polygons in the coordinate plane given coordinates for the vertices.	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	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.	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.4	identify the net of a right prism, with support.	identify the net of a right prism.	represent three-dimensional figures using nets made up of rectangles and triangles and use nets to find the surface area of three-dimensional figures.	use nets to find the surface area of three-dimensional figures in both mathematical and real-world contexts.

Reporting Category / Domain		Statistics and Probability			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster I - Develop understanding of statistical variability.	6.SP.1	recognize a statistical question from a list of questions.	change a question from a non-statistical question to a statistical question.	recognize a statistical question as one that anticipates variability.	create a statistical question as one that anticipates variability.
	6.SP.2	identify the corresponding graph from a given set of data or given a graph, a student identifies its corresponding data.	recognize that a set of data collected to answer a statistical question has a distribution which can be described by using measures of center and spread.	demonstrate that a set of data can be described by its center, spread, and overall shape.	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.3	recognize that a measure of center is the mean and median.	understand that the mean and the median are measures of center while a measure of variation is the range.	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.	make generalizations about the mean absolute deviation and the interquartile range as measures of variation for a numerical data set.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster J - Summarize and describe distributions.	6.SP.4	identify an appropriate display of numerical data in plots on a number line, including dot plots or histograms.	display numerical data on a number line, including dot plots and/or histograms.	display numerical data in plots on a number line, including dot plots, histograms, and box plots.	construct a histogram or box plot from data displayed in a dot plot.
	6.SP.5	summarize the data in a line plot by counting the number of observations; identify the range and measure of center used.	summarize a numerical data set by counting the number of observations; identify the range and measures of center and any striking deviations.	calculate measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation) for a numerical data set.	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.

Level	Below Basic	Basic	Proficient	Advanced
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Range PLDs

Describes the expectations for students across each standard and proficiency level; reflects the knowledge, skills, and processes that are expected of students.

Reporting Category / Domain		Ratio and Proportional Relationships			
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster A - Analyze proportional relationships and use them to solve real-world and mathematical problems.	7.RP.1	compute unit rates associated with ratios of integers having like units.	compute unit rates associated with ratios of integers.	compute unit rates associated with ratios of like or unlike rational numbers.	compute unit rates associated with ratios of rational numbers including complex fractions.
	7.RP.2a	determine whether two quantities are a proportional relationship, with support.	determine whether two quantities are a proportional relationship.	determine whether two quantities are a proportional relationship in a table of values or graph.	determine whether two quantities are a proportional relationship in a verbal description or equation.
	7.RP.2b	identify the constant of proportionality as a unit rate, with support.	identify the constant of proportionality as a unit rate.	identify the constant of proportionality (unit rate) in graphs, tables, equations, and diagrams.	identify the constant of proportionality (unit rate) in verbal descriptions.
	7.RP.2c	identify the equation that models a relationship from a given representation with a proportional relationship.	model a proportional relationship using an equation when given a simple table, graph, or verbal description.	create equations that represent proportional relationships.	creates a representation with a real-world context that would represent a given proportional equation.

(cont.) Range PLD: Cluster A	7.RP.2d	identify the x- and y-coordinates on a graph.	identify the x- and y-coordinates on a graph in a real-world context.	explain what a point (x , y) on the graph of a proportional relationship means in terms of the situation it models.	identify the coordinates of another point which follows the proportional relationship and explain the reasoning.
	7.RP.3	solve for an unknown value in proportional problems given the equation a /b = c /d, with support.	solve for an unknown value in proportional problems given the equation a/b = c/d.	use proportional relationships to solve ratio and percent problems that require multi-steps.	use proportional relationships to solve ratio and percent problems that require multi-steps in a real-world context.
Reporting Category / Domain		**The Number System**			
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster B - Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	7.NS.1a-d	add and subtract two integers using a number line or manipulatives.	add and subtract two integers.	add and subtract up to three rational numbers.	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.2a-c	multiply and divide two integers using a number line or manipulatives.	multiply and divide two integers.	multiply and divide up to three rational numbers.	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.2d	identify a rational number as a quotient of integers given the divisor is not zero.	multiply or divide rational numbers using a number line or other manipulatives.	convert a fraction into a terminating or repeating decimal and a terminating decimal into a fraction using long division.	convert a repeating decimal into a fraction.
	7.NS.3	solve mathematical problems involving one operations with integers.	solve mathematical problems involving at least two of the operations with integers.	solve mathematical and real-world problems involving at least two of the operations with rational numbers.	solve mathematical and real-world problems involving three or more of the operations, including complex fractions.

Reporting Category / Domain		Expressions and Equations			
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster C - Use properties of operations to generate equivalent expressions.	7.EE.1	recognize equivalent expressions.	generate equivalent expressions by adding and subtracting integers.	generate equivalent expressions by adding, subtracting, multiplying, and factoring with at least one rational coefficient.	generate equivalent expressions by adding, subtracting, multiplying, and factoring with multiple rational coefficients.
	7.EE.2	rewrite in different forms, using one operation, an expression in a mathematical context, with support.	rewrite in different forms, using one operation, an expression in a mathematical context.	rewrite, using two or more operations, an expression in different forms from a contextual problem.	interpret the relationships between expressions.
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster D - Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	7.EE.3a	solve one-step mathematical problems consisting of integers.	solve two-step mathematical problems consisting of integers.	solve multi-step real-world and mathematical problems consisting of positive and negative rational numbers given in any form.	assess the reasonableness of answers to real-world and mathematical problems by estimation.
	7.EE.3b	approximate answers to mathematical problems by estimation, with support.	approximate answers to mathematical problems by estimation.	approximate answers to real-world and mathematical problems by estimation.	assess the reasonableness of answers to real-world and mathematical problems by estimation.
	7.EE.4a	solve one-step mathematical problems involving integers.	solve one-step mathematical problems leading to equations involving integers and two-step mathematical problems leading to equations involving whole numbers.	solve two-step real-world and mathematical problems leading to equations involving rational numbers.	solve real-world and mathematical problems leading to equations involving rational numbers, and use the solution to answer additional questions.
	7.EE.4b	solve one-step mathematical problems leading to inequalities involving integers.	solve one-step and two-step mathematical problems leading to inequalities involving whole numbers.	solve two-step real-world and mathematical problems leading to inequalities involving rational numbers. Students graph the solution set of an inequality and interpret the meaning of the graph with respect to the problem.	solve two-step real-world and mathematical problems leading to inequalities involving rational numbers and use the solution to answer additional questions.

Reporting Category / Domain		Geometry			
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster E - Draw, construct, and describe geometrical figures and describe the relationships between them.	7.G.1	compute a single dimension from a scale drawing given an integer scale factor, with support.	compute a single dimension from a scale drawing given an integer scale factor.	compute actual lengths from scale drawings and verbal descriptions.	identify and reproduce scale drawing(s) at different scales with respect to the dimensions of the actual figure.
	7.G.2	identify types of angles.	identify the type of triangle with respect to angle measures and side measures.	determine if the three measures of angles or sides meets the condition of a unique triangle, more than one triangle, or no triangle.	explain the conditions for a unique triangle, more than one triangle, or no triangle.
	7.G.3	identify the two-dimensional figure that results from a vertical or horizontal cut of a right rectangular prism.	determine which two-dimensional figure (cross-section) results from slicing right rectangular pyramid given a figure with the cross-section shown.	determine which two-dimensional figure (cross-section) results from slicing right rectangular prisms or right rectangular pyramids given a verbal description.	determine which two-dimensional figure (cross-section) results from slicing cylinders, cones, or spheres.
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster F - Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	7.G.4	identify expressions that represents the area and circumference of a circle given the dimensions, with support.	identify expressions that represents the area and circumference of a circle given the dimensions.	calculate the area and circumference of a circle.	solve for a component part (radius or diameter) given the circumference of a circle.
	7.G.5	identify supplementary, complementary, vertical, and adjacent angles.	understand the relationship between a pair of supplementary, complementary, or vertical angles.	solve equations with two-steps for an unknown angle in a pair of complementary, supplementary, or vertical angles.	solve equations with three or more steps for an unknown angle in a pair of complementary, supplementary, or vertical angle.
	7.G.6a	find the area of triangles, quadrilaterals, and regular polygons.	solve real-world and mathematical problems involving the area of a polygon composed of two figures consisting of triangles and rectangles.	solve real-world and mathematical problems involving the area of a polygon composed of no more than three figures consisting of triangles and quadrilaterals.	solve real-world and mathematical problems involving the area of a figure composed of polygons.

Reporting Category / Domain		Geometry (cont.)			
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster F - Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	7.G.6b	find the volume of cubes.	solve real-world and mathematical problems involving the volume of a right prism given the area of the base and the height.	solve real-world and mathematical problems involving the volume of a solid composed of two right prism.	solve real-world and mathematical problems involving the volume of a solid composed of three or more right prisms.
	7.G.6c	calculate the area of a rectangle.	determine the surface area of a right rectangular prism.	solve real-world and mathematical problems involving the surface area of a right prism.	solve real-world and mathematical problems involving the surface area of a solid composed of right prisms.
Reporting Category / Domain		**Statistics and Probability**			
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster G - Use random sampling to draw inferences about a population.	7.SP.1	identify and recognize sample populations given a scenario describing the entire population.	identify a statistical question that can be used to sample a population.	identify the characteristics of valid random samples and how they produce representative samples and valid inferences about a population.	identify real-life situations where random sampling is used and can explain its usefulness.
	7.SP.2	determine whether a sample is random or not.	recognize that a random sample produces the most valid representation of the entire population.	use data from a random sample to draw generalizations and inferences about a population.	examine the validity of inferences about a population. Compare multiple random samples of the same size from a population to analyze the variations in the population.
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster H - Draw informal comparative inferences about two populations.	7.SP.3	calculate measures of central tendency.	informally use measures of central tendency to draw comparisons about two different populations.	informally use measures of central tendency and variability to compare and contrast inferences about two populations in any context.	informally use measures of variability for numerical data from random samples to compare and contrast comparative inferences about two populations.
	7.SP.4	determine the measures of center of two data sets.	compare the measures of center of two data sets.	compare two populations with respect to the measures of center and measures of variability.	draw inferences about two populations with respect to the measures of center and measures of variability.

Reporting Category / Domain		Statistics and Probability (cont.)			
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster I - Investigate chance processes and develop, use, and evaluate probability models.	7.SP.5	know the probability of a chance event is a number between 0 and 1.	describe the probability of a chance event as a number between 0 and 1.	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.	explain the relationships between probability and collected data, including simulations.
	7.SP.6	approximate probability for a chance event.	use the results of an experiment to estimate the probability of the event.	observe and predict the relative frequency of an event given the probability of the event.	recognize and justify why the experimental probability approaches the theoretical probability as the relative frequency of an event increases.
	7.SP.7a-b	determine the theoretical probability of a simple event.	determine probabilities of simple probability models.	approximate the probability of an event from collected data.	determine the probability of multiple-event probability models.
	7.SP.8a-c	define a sample space.	determine the sample space from two compound events using lists, tables, and tree diagrams.	determine the probability of compound events consisting of two simple events.	determine the probability of compound events consisting of more than two simple events.

Level	Below Basic	Basic	Proficient	Advanced
Policy PLDs **(Performance Level Descriptors)** General descriptors that provide overall claims about a student's performance in each performance level; used to broadly articulate the goals and rigor for the state's performance standards.	Students performing at below basic level in Mathematics have minimal or no academic performance indicating understanding and little display of the knowledge and skills included in the Wyoming Content and Performance Standards.	Students performing at the basic level in Mathematics have 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.	Students performing at the proficient level in Mathematics have satisfactory academic performance indicating a solid understanding and display of the knowledge and skills included in the Wyoming Content and Performance Standards.	Students performing at the advanced level in Mathematics have superior academic performance indicating an in-depth understanding and exemplary display of the knowledge and skills included in the Wyoming Content and Performance Standards.

Range PLDs

Describes the expectations for students across each standard and proficiency level; reflects the knowledge, skills, and processes that are expected of students.

Math Domain / Reporting Category		The Number System			
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster A - Know that there are numbers that are not rational and approximate them by rational numbers.	8.NS.1	understand a fraction can be written as a decimal.	identify numbers as being rational or irrational.	determine the repeating decimal expansion for a rational number and determine the rational number from a repeating decimal expansion.	notice and explain the patterns that exist when writing rational numbers as fractions.
	8.NS.2	convert a fraction to a decimal.	convert a fraction to a decimal with one repeating digit.	determine that a non-repeating decimal expansion represents an irrational number.	use approximation strategies with rational numbers to identify and compare the estimated values of irrational numbers with respect to a real number line.

Reporting Category / Domain		Expressions and Equations			
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster B - Work with radicals and integer exponents.	8.EE.1	knows the properties of integer number exponents.	apply the properties of integer exponents.	apply the properties of integer exponents with integers to generate equivalent numerical expressions.	apply the properties of integer exponents with integers involving multiple negative exponents.
	8.EE.2	evaluate square roots of small perfect squares.	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.	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. Students evaluate square roots of perfect squares up to 144 and cube roots of perfect cubes up to 1,000.	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.
	8.EE.3	write powers of 10 in expanded form.	understand how a positive or negative exponent affects the value of a number.	use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.	use numbers expressed in the form of a rational number times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.
	8.EE.4	represent very large and very small quantities in scientific notation.	multiply and divide numbers in scientific notation.	compare or multiply/divide two numbers in scientific notation. Students choose units of appropriate size for measurements of very large or very small quantities in scientific notation.	compare or apply the four operations (+, -, x, and ÷) between two or more numbers in scientific notation.
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster C - Understand the connections between proportional relationships, lines, and linear equations.	8.EE.5	recognize a proportional relationship from a table of values.	graph proportional relationships from a table of values.	graph proportional relationships from the equation y = mx. Students interpret the unit rate within context as the slope of the graph. Compare two different proportional relationships represented in different ways.	Students explain why the slope (m) is equivalent between any two different points located on any non-vertical line in the coordinate plane.

Reporting Category / Domain		Expressions and Equations (cont.)			
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
cont. Cluster C - Understand the connections between proportional relationships, lines, and linear equations.	8.EE.5	recognize a proportional relationship from a table of values.	graph proportional relationships from a table of values.	graph proportional relationships from the equation y = mx. Students interpret the unit rate within context as the slope of the graph.	compare two different proportional relationships represented in different ways. 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.6	determine the slope of a line given a graph.	derive the equation y = mx with slope (m).	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.	derive the equation y = mx + b with slope (m) and y -intercept (b) from a verbal description.
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster D - Analyze and solve linear equations and pairs of simultaneous linear equations.	8.EE.7	solve simple one-step linear equations with integer coefficients.	solve two-step linear equations in one variable with integer coefficients and constant.	solve linear equations in one variable with integer coefficients and constants that require multisteps and identify the solution of a linear equation in one variable as infinitely many solutions or no solutions.	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.8a-c	identify systems of equations that have one solution, infinitely many solutions, or no solutions from a graph.	identify the solution to a system of two linear equations from a graph as the point of intersection of the two lines.	solve systems of two linear equations in two variables algebraically or graphically that has one, infinitely many, or no solutions.	construct and solve systems of two linear equations which represent real-world or mathematical problems.

Reporting Category / Domain		Functions			
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster E - Define, evaluate, and compare functions.	8.F.1	identify whether a relation is a function from a graph or a mapping.	evaluate functions with integer coefficients and constants with positive integers as the inputs.	evaluate functions with rational coefficients and constants with integers as the inputs. Students identify if a table of values or a graph in the coordinate plane represent a function.	evaluate functions with rational coefficients and constants with rational numbers as the inputs.
	8.F.2	evaluate functions with integer coefficients and constants with integers as the input.	evaluate functions with rational coefficients and constants with rational numbers as the input.	compare the properties of two linear functions represented in different ways.	compare the properties of two functions, with at least one non-linear function, which are represented in different ways.
	8.F.3	identify linear and non-linear functions represented by graphs.	identify linear and non-linear functions represented by tables.	identify linear and non-linear functions represented by equations and tables.	identify linear and non-linear functions represented by verbal descriptions.
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster F - Use functions to model relationships between quantities.	8.F.4	determine the rate of change of the function from a graphical description of the linear function.	determine the rate of change and initial value of the function from two (x,y) values. Construct a graph to model a linear relationship between two quantities.	interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. Construct a function to model a linear relationship between two quantities.	identify what prevents a set of values in either a table or graph from being linear and adjust the values to make them linear.
	8.F.5	determine if a relationship is a function.	identify graphs of functional relationships as being linear or non-linear.	identify and describe the qualitative features from analyzing a linear function. Sketch a graph that exhibits given qualitative features of a function.	identify and describe the qualitative features from analyzing a non-linear function.

Reporting Category / Domain		Geometry			
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster G - Understand congruence and similarity using physical models, transparencies, or geometry software.	8.G.1	identify the lines or line segments that correspond from one translation to another.	identify the transformations (rotation, reflection, and translation) of figures.	describe the effects on lines, line segments, and angles of figures when rotations, reflections, and translations are performed.	recognize and explain the properties of rotations, reflections, and translations in real-world graphic illustrations and visual representations.
	8.G.2	identify two congruent figures using rotations, reflections, or transformations.	identify a transformation between two congruent figures.	describe the properties of congruency between two figures when at most two transformations are performed.	describe the properties of congruency between two figures when three or more transformations are performed.
	8.G.3	identify a visual representation of a dilation, translation, rotation, or reflection.	perform translations on the coordinate plane.	identify coordinates when a sequence of rotations, reflections, translations, or dilations are performed in the coordinate plane.	explain the sequence of rotations, reflections, translations, and dilations performed on the pre-image to determine the image.
	8.G.4	identify similar figures.	identify similarity from a sequence of transformations.	describe the properties of similarity between two figures when transformations are performed.	explain a sequence of rotations, reflections, translations, and dilations that mantains similarity between the pre-image and determined image.
	8.G.5	identify one angle pair when parallel lines are cut by a transversal. Know that the sum of angles of a triangle equals 180.	identify the types of angles created when parallel lines are cut by a transversal. Find unknown angle measures in a triangle.	determine facts about the angle sum and exterior angles of triangles, about t he angles created wthen parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles,	describe the property of similarity with triangles when identifying and establishing the Angle-Angle (AA) criterion for the triangle.
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster H - Understand and apply the Pythagorean theorem.	8.G.6	recognize the Pythagorean Theorem and that it applies to right triangles.	identify the Pythagorean Theorem and its converse.	explain the proof of the Pythagorean Theorem and its converse.	model a proof of the Pythagorean Theorem and its converse using a pictorial representation.
	8.G.7	evaluate square roots.	apply the Pythagorean Theorem in mathematical problems by setting up the equation $a^2 + b^2 = c^2$.	calculate the unknown side lengths in right triangles in real-world and mathematical problems.	recognize situations and applies the Pythagorean Theorem in multi- step problems.

Reporting Category / Domain		Geometry			
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced studnets:**
cont. Cluster H - Understand and apply the Pythagorean theorem.	8.G.8	draw a right triangle on a grid.	calculate the distance between two points on a grid by applying the Pythagorean Theorem where the Pythagorean Theorem is given.	calculate the distance between two points on a grid by applying the Pythagorean Theorem where the Pythagorean Theorem is not given.	calculate the distance between two points by applying the distance formula.
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster I - Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.	8.G.9	identify cones, cylinders, and spheres.	identify the formulas for the volumes of cones, cylinders, and spheres.	calculate the volumes of a cone, cylinder, or sphere as a decimal value or in terms of pi.	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.
Reporting Category / Domain		**Statistics and Probability**			
Standard	**Benchmark**	**Below Basic students may or may not be able to :**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster J - Investigate patterns of association in bivariate data.	8.SP.1	informally describe observed pattern in a scatter plot.	identify the pattern of association in scatter plots as a positive association, negative association, or no association.	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.	identify the pattern of association given a verbal description as a positive association, negative association, or no association.
	8.SP.2	recognize a pattern in a scatter plot.	draw a straight line on a scatter plot that closely fits the data points.	identify a line of best fit for scatter plots.	graph a curve of best fit for scatter plots.
	8.SP.3	use the graph of a linear model in the context of data to identify slope and intercepts.	use the equation of a linear model in the context of data to identify slope and intercepts.	use the equation of a linear model in the context of data to interpret the meaning of the slope and intercepts.	use the data in a scatter plot to create an equation of a line of best fit.
	8.SP.4	complete a table when given data.	construct a two-way table of categorical data and identifies values from the table.	construct a two-way table and interpret the data numerically in the table.	justify conclusions about the frequencies and relative frequencies of data in a two-way table.

Level	Below Basic	Basic	Proficient	Advanced
Policy PLDs **(Performance Level Descriptors)** General descriptors that provide overall claims about a student's performance in each performance level; used to broadly articulate the goals and rigor for the state's performance standards.	Students performing at below basic level in Mathematics have minimal or no academic performance indicating understanding and little display of the knowledge and skills included in the Wyoming Content and Performance Standards.	Students performing at the basic level in Mathematics have 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.	Students performing at the proficient level in Mathematics have satisfactory academic performance indicating a solid understanding and display of the knowledge and skills included in the Wyoming Content and Performance Standards.	Students performing at the advanced level in Mathematics have superior academic performance indicating an in-depth understanding and exemplary display of the knowledge and skills included in the Wyoming Content and Performance Standards.

Range PLDs

Describes the expectations for students across each standard and proficiency level; reflects the knowledge, skills, and processes that are expected of students.

Reporting Category / Conceptual Category			Seeing Structure			
Domain	Standard	Benchmark	Below Basic students may or may not be able to:	Basic students:	Proficient students:	Advanced students:
Seeing Structure in Expressions	**Range PLD: Cluster A -** Interpret the structure of expressions.	A.SSE.1a-b	identify some of the basic terms (base, exponent, coefficient, and factor) of a linear, exponential, or quadratic expression.	identify all of the basic terms (base, exponent, coefficient, and factor) of linear, exponential, and quadratic expressions.	interpret complicated expressions by viewing one or more of their parts as a single entity.	explain the context of different parts of a formula presented as a complicated expression.
	Range PLD: Cluster B - Write expressions in equivalent forms to solve problems.	A.SSE.3a	identify the zeroes of a quadratic expression written in factored form.	factor a quadratic expression with a leading coefficient of one.	factor a quadratic expression to reveal the zeroes of the function it defines.	explain conditions for two, one, and no real roots.
		A.SSE.3b	identify the maximum or minimum of a function, using the graph.	identify the maximum or minimum of a function when given in vertex form.	complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	complete the square in a quadratic expression and interpret results in a real-world context.
		A.SSE.3c	identify the properties of exponents.	apply the properties of exponents.	use the properties of exponents to transform expressions for exponential functions.	rewrite rational exponents as radicals.

Reporting Category / Conceptual Category			Creating Equations			
Domain	Standard	Benchmark	Below Basic students may or may not be able to:	Basic students:	Proficient students:	Advanced students:
Creating Equations	**Range PLD: Cluster G -** Create equations that describe numbers or relationships.	A.CED.1	create a simple linear, exponential, or quadratic equation or inequality that models a given situation.	create a simple linear, exponential, or quadratic equation or inequality that models a given situation and uses it to solve a problem.	create linear, exponential, and quadratic equations and inequalities from contextual situations and uses these to solve problems.	solve and interpret the solution to created linear, exponential, and quadratic equations and inequalities in context. Solves compound inequalities. Includes interval notation to represent inequalities.
Reporting Category / Conceptual Category			**Reasoning**			
Reasoning w/ Equations & Inequalities	**Range PLD: Cluster H -** Understand solving equations as a process of reasoning and explain the reasoning.	A.REI.1	solve a linear equation with multiple steps, without justifying the steps involved in solving.	describe the steps in solving linear equations.	explain and justify the steps in solving linear equations by applying the properties of equality, inverse, and identity.	explain and justify the steps in solving linear equations by applying and naming the properties of equality, inverse, and identity.
	Range PLD: Cluster I - Solve equations and inequalities in one variable.	A.REI.3	solve linear equations and inequalities in one variable.	solve linear equations and inequalities in one variable limited to equations with numerical coefficients, where that variable is included on both sides of the equal sign or inequality.	solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	solve linear equations and inequalities in one variable, including equations with coefficients represented by letters within a real-world context.
	Range PLD: Cluster J - Solve systems of equations.	A.REI.5	explain the use of the multiplication property of equality to solve a system of equations.	explain why the sum of two equations is justifiable in the solving of a system of equations.	prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	using multiple methods, prove that given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

Reasoning w/ Equations & Inequalities	**Range PLD: Cluster J -** Solve systems of equations.	A.REI.6	solve a system of linear equations approximately when given a graph of the system.	test a solution to the system in both original equations (both graphically and algebraically).	solve a system of linear equations exactly and approximately by choosing the best method depending on the representation of the equations.	analyze the system of equations and is able to solve exactly and approximately given a context or real-world situation. Solve a system of equations and manipulates one of the equations to provide additional information or an additional given solution.
Reporting Category / Conceptual Category			**Functions**			
Domain	**Standard**	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Interpreting Functions	**Range PLD: Cluster A -** Understand the concept of a function and use function notation.	F.IF.1	identify functions, including functions represented in equations, tables, graphs, or context.	define functions, including functions represented in equations, tables, graphs, or context.	demonstrate understanding that a function's domain assigns to exactly one element of the range. Understand input and output values.	apply and extend knowledge of domain and range to real-world situations and contexts.
		F.IF.2	evaluate simple functions in their domains. Rewrite an equation in function notation when given in y = form.	evaluate functions for inputs in their domain. Write functions using function notation (without context).	use function notation and evaluate functions for inputs in their domain, and interprets statements that use function notation in terms of a context.	create context from a given domain and range and uses function notation to write an equation to model the context.
		F.IF.3	identify the parts of a recursive function or sequence.	define and express a recursive sequence as a function.	recognize that sequences are functions. Recognize that a sequence has a domain which is the subset of integers and can find a term given the recursive function.	apply the ideas of sequences being functions to real-world contexts.

Reporting Category / Conceptual Category			Functions (cont.)			
Domain	Standard	Benchmark	Below Basic students may or may not be able to:	Basic students:	Proficient students:	Advanced students:
Interpreting Functions	**Range PLD: Cluster B -** Interpret functions that arise in applications in terms of the context.	F.IF.4	identify the key features of a linear, exponential, or quadratic graph.	identify the key features of a linear, exponential, or quadratic graph.	identify and interpret the key features of a graph when given a table of values for a linear, exponential, or quadratic function. Create graphs showing key features, when given a verbal description of the relationship.	create graphs to model a situation.
		F.IF.5	identify domains of functions when given a graph.	relate the domain of a function to its graph and graphs a function given a restricted domain.	relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. Graph a function given a restricted domain and identifies reasonability of a domain in a particular context.	create a function for a given context where the domain meets given parameters.
		F.IF.6	determine the average rate of change of a linear function presented algebraically.	determine the average rate of change of a linear, exponential, or quadratic function presented in a table.	calculate and interpret the average rate of change of a linear, exponential, or quadratic function over a specified interval. Estimate the rate of change from a graph.	analyze the difference between the rates of change of different types of functions.
	Range PLD: Cluster C - Analyze functions using different representations.	F.IF.7a	identify the graph of a linear or quadratic function given its equation.	conduct the graph of a linear or quadratic function given its equation.	construct the graph of a linear and quadratic function given its equation and identifies the x- and y-intercepts, maxima, and minima.	graph and compare linear and quadratic functions expressed in various forms.
Building Functions	**Range PLD: Cluster D -** Build a function that models a relationship between two quantities.	F.BF.1a	recognize a relationship between explicit or recursive.	describe an explicit or recursive expression for a linear function.	determine an explicit or recursive expression for a linear or exponential function or recursive process for a given context.	create an explicit or recursive expression for a linear or exponential function or recursive process for a given context.

Reporting Category / Conceptual Category			Functions (cont.)			
Domain	Standard	Benchmark	Below Basic students may or may not be able to:	Basic students:	Proficient students:	Advanced students:
Linear, Quadratic, and Exponential Models	**Range PLD: Cluster F -** Construct and compare linear, quadratic, and exponential models and solve problems.	F.LE.1c	recognize an exponential function.	recognize relationships in tables and graphs that can be modeled with exponential functions (multiplicative rate of change).	recognize situations that increase or decrease by a constant percent rate per unit interval.	make connections between growth and decay models to a constant percentage rate in a real-world context.
Reporting Category / Conceptual Category			**Real Number System**			
Domain	Standard	Benchmark	Below Basic students may or may not be able to:	Basic students:	Proficient students:	Advanced students:
Real Number System	**Range PLD: Cluster A -** Extend the properties of exponents to rational exponents.	N.RN.1	use proper notation and use structure for integer exponents only.	use proper notation for radicals in terms of rational exponents, but is unable to explain the meaning.	explain and use the meaning of rational exponents in terms of properties of integer exponents, and uses proper notation for radicals in terms of rational exponents.	prove, use, and explain the properties of rational exponents (which are an extension of the properties of integer exponents), and extend to real-world context.
		N.RN.2	convert radical notation to rational exponent notation.	identify equivalent forms of expressions involving rational exponents (but is not able to rewrite or find the product of multiple radical expressions).	rewrite expressions involving radicals and rational exponents, using the properties of exponents.	compare contexts where radical form is preferable to rational exponents, and vice versa.
	Range PLD: Cluster B - Use properties of rational and irrational numbers.	N.RN.3	explain why adding and multipling two rational numbers results in a rational number.	explain why adding a rational number to an irrational number results in an irrational number.	explain why multipling a nonzero number and an irrational number results in an irrational number.	generalize and develop rules for sum and product properties of rational and irrational numbers.

Reporting Category / Conceptual Category			Statistics and Probabilty			
Domain	Standard	Benchmark	Below Basic students may or may not be able to:	Basic students:	Proficient students:	Advanced students:
Interpreting Categorical and Quantitative Data	**Range PLD: Cluster A -** Summarize, represent, and interpret data on a single count or measurement variable.	S.ID.1	identify dot plots, histograms, and box plots for a given set of data.	graph numerical data on a given real number line using dot plots, histograms, and box plots.	graphically represent data on dot plots, histograms, and box plots.	determine and justify which type of data plot on a real number line would be most appropriate for a set of data. Identify advantages and disadvantages of different types of data plots.
		S.ID.2	describe informally the center and spread of a single set of data or graph.	compares informally the similarities or differences in shape, center, or spread between two graphs.	determine the appropriate measures of center and spread, given two sets of data or two graphs.	justify the appropriate measure of center and spread, given two sets of data or two graphs.
	Range PLD: Cluster C - Interpret linear models.	S.ID.9	define causation and correlation.	identifies the existence or non-existence of causation in the context of a correlated problem.	distinguish between causation and correlation in the context of a situation with data.	support or refute claims of causation with the understanding that a strong correlation does not imply causation.

Level	Below Basic	Basic	Proficient	Advanced
Policy PLDs (Performance Level Descriptors) General descriptors that provide overall claims about a student's performance in each performance level; used to broadly articulate the goals and rigor for the state's performance standards.	Students performing at below basic level in Mathematics have minimal or no academic performance indicating understanding and little display of the knowledge and skills included in the Wyoming Content and Performance Standards.	Students performing at the basic level in Mathematics have 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.	Students performing at the proficient level in Mathematics have satisfactory academic performance indicating a solid understanding and display of the knowledge and skills included in the Wyoming Content and Performance Standards.	Students performing at the advanced level in Mathematics have superior academic performance indicating an in-depth understanding and exemplary display of the knowledge and skills included in the Wyoming Content and Performance Standards.

Range PLDs

Describes the expectations for students across each standard and proficiency level; reflects the knowledge, skills, and processes that are expected of students.

Reporting Category / Domain		Congruence			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster A - Experiment with transformations in the plane.	G.CO.1	describe reflections, rotations, and translations.	informally define an angle, circle, perpendicular line, parallel line, and line segment using examples and non-examples.	define angle, circle, perpendicular line, parallel line, and line segment based on the notions of point, line, distance along a line, and distance around a circular arc using precise mathematical terminology.	apply the definition of an angle, circle, perpendicular line, parallel line, and line segment using precise definitions to real-world examples.
	G.CO.2	describe reflections, rotations, and translations.	describe reflections, rotations, translation, and dilations.	compare transformations in the plane and understands them as functions that take points in the plane as inputs and give other points as outputs.	represent functions to describe transformations using a variety of media.
	G.CO.3	distinguish between rotations and reflections given a rectangle, parallelogram, trapezoid, or regular polygon and its transformation.	identify lines and points of symmetry given a rectangle, parallelogram, trapezoid, or regular polygon and its reflection or rotation.	describe the rotations and reflections that a given rectangle, parallelogram, trapezoid, or regular polygon may use to carry it onto itself.	identify a rectangle, parallelogram, trapezoid, or regular polygon that satisfies a description of rotational symmetry or lines of symmetry.
	G.CO.4	identify rotations, reflections, and translations given an image and its transformation.	informally describe rotations, reflections, and translations using examples and non-examples.	develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	justify statements about rotations, reflections, and translations on the coordinate plane.

Reporting Category / Domain		Congruence (cont.)			
cont. Cluster A - Experiment with transformations in the plane.	G.CO.5	perform rotations, reflections, and translations on a given figure.	identify a sequence of transformations that will carry a given figure onto another.	perform rotations, reflections, and translations using a variety of methods and specifies the sequence of transformations that will carry a given figure onto another.	explain how the order of a sequence of transformations is performed may result in different outcomes.
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster B - Understand congruence in terms of rigid motions.	G.CO.6	recognize transformations of a given figure based on descriptions of rigid motion.	predict the effect of a transformation of a given figure based on descriptions of rigid motion.	determine the congruence of two figures using transformations of rigid motion.	justify the congruence of two complex figures using properties of rigid motion.
	G.CO.7	identify corresponding pairs of angles or corresponding pairs of sides of two triangles that are congruent.	identify corresponding pairs of angles and corresponding pairs of sides of two triangles that are congruent.	show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent (CPCTC) using the definition of congruence in terms of rigid motions.	justify that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent in a context.
	G.CO.8	identify corresponding parts of two congruent triangles.	identify the minimum conditions necessary for triangle congruence (ASA, SAS, SSS).	demonstrate how the criteria for triangle congruence (ASA, SAS, SSS) follow from the definition of congruence in terms of rigid motions.	understand and explains why SSA and AAA do not provide enough evidence for triangle congruence.
Range PLD: Cluster C - Prove geometric theorems.	G.CO.9	informally describe examples of theorems about lines and angles.	determine the validity of statements within a given proof of a theorem about lines and angles.	prove theorems about lines and angles.	apply theorems about lines and angles to a real-life context.
	G.CO.10	informally describe examples of theorems about triangles.	determine the validity of statements within a given proof of a theorem about triangles.	prove theorems about triangles.	apply theorems about triangles to a real-life context.
	G.CO.11	informally describe examples of theorems about parallelograms.	determine the validity of statements within a given proof of a theorem about parallelograms.	prove theorems about parallelograms.	apply theorems about parallelograms to a real-life context.
Range PLD: Cluster D - Make geometric constructions.	G.CO.12	copy a line segment and an angle.	bisect a line segment and an angle.	construct perpendicular lines, a perpendicular bisector of a line segment, and a line parallel to a given line through a point not on the line.	create a polygon given certain attributes, using geometric constructions.
	G.CO.13	construct congruent segments and perpendicular lines.	construct an equilateral triangle and a square.	construct a regular hexagon, square, and equilateral triangle inscribed in a circle.	construct other regular polygons inscribed in a circle.

Reporting Category / Domain		Similarity, Right Triangles, and Trigonometry			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster E - Understand similarity in terms of similarity transformations.	G.SRT.1a-b	identify dilations.	identify the scale factors of dilations.	verify the properties of dilations given by a center and a scale factor, by understanding that a dilation creates parallel lines and line segments in ratios of the scale factor.	locate the center of dilation and scale factor, given a pair of similar figures on a coordinate plane.
	G.SRT.2	identify corresponding parts of two similar figures.	determine whether two given figures are similar.	explain that two given figures are similar in terms of similarity transformations.	prove or disprove that two given figures are similar, using transformations and the definitions of similarity.
	G.SRT.3	identify similarity transformations.	identify triangle similarity by the use of the AA criterion.	establish the AA criterion for two triangles to be similar by using the properties of similarity transformations.	prove that two triangles are similar if two angles of one triangle are congruent to two angles of the other triangle, using the properties of similarity transformations.
Range PLD: Cluster F - Prove theorems involving similarity.	G.SRT.4	informally describe examples of theorems about triangles.	determine the validity of statements within a given proof of a theorem about triangles.	prove theorems about triangles.	apply theorems about triangles to a real-life context.
	G.SRT.5	find measures of sides and angles of congruent and similar triangles.	solve problems involving triangles, using congruence and similarity criteria.	solve problems and proves relationships in geometric figures by using congruence and similarity criteria for triangles. Include problems from context.	prove conjectures about congruence or similarity in geometric figures, using congruence and similarity criteria for triangles. Include problems from context.
Range PLD: Cluster G - Define trigonometric ratios and solve problems involving right triangles.	G.SRT.6	understand that, in similar triangles, corresponding angles are congruent and ratios of corresponding sides are equal.	define sine, cosine, and tangent as the ratio of sides of a right triangle.	understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratio for acute angles.	determine the similarity of right triangles by comparing the trigonometric ratios of the corresponding sides.
	G.SRT.8	solve right triangles using the Pythagorean Theorem.	apply the Pythagorean Theorem in real-life and mathematical contexts.	solve right triangles using trigonometric ratios in applied/contextual problems.	model solutions to situations, using trigonometric ratios and the Pythagorean Theorem, by constructing equations that can be used to solve the problem. Include problems from context.

Reporting Category / Domain		Circles			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster I - Understand and apply theorems about circles.	G.C.1	know the definition of a circle as a set of points equidistant from a given point.	recognize that all circles are similar.	prove that all circles are similar.	solve applied math problems, using the fact that all circles are similar.
	G.C.2	identify inscribed angles, radii, and chords in circles.	recognize relationships among inscribed angles, radii, and chords in circles.	describe relationships among inscribed angles, radii, and chords in circles.	solve problems using relationships among inscribed angles, radii, and chords in circles.
Reporting Category / Domain		**Expressing Geometric Properites with Equations**			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster K - Translate between the geometric description and the equation for a conic section.	G.GPE.1	identify the center and radius of a circle, given an equation written in (x - h)2 + (y - k)2 = r2 form.	create the equation for a circle, when given the center and radius.	complete the square to find the center and radius of a circle given by its equation.	determine the equation of a circle, given points of tangency.
Range PLD: Cluster L - Use coordinates to prove simple geometric theorems algebraically.	G.GPE.4	solve problems algebraically, using geometric theorems involving a circle on the coordinate plane. Locate segments on a coordinate plane that are parallel or perpendicular by calculating slopes.	prove simple geometric theorems using coordinates, when given a visual representation on the coordinate plane, including calculating lengths of segments.	prove simple geometric theorems algebraically using coordinates.	justify statements about geometric figures using coordinates and constructs visual representations on the coordinate plane that meet given conditions for coordinates.
	G.GPE.5	explain why the slopes of parallel lines are equal and the slopes of perpendicular lines are negative reciprocals or one that is 0 and the other that is undefined.	create the equation of a line that passes through a specific point given its slope.	create the equation of a line parallel or perpendicular to a given line that passes through a given point.	create the equation of a line parallel or perpendicular to a given line that passes through a given point in a context.

Reporting Category / Domain		Expressing Geometric Properites with Equations (cont.)			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
cont. Cluster L - Use coordinates to prove simple geometric theorems algebraically.	G.GPE.6	find the point on a line segment that partitions the segment in a given ratio, with a visual representation of the line segment.	find the point on a line segment that partitions the segment in a given ratio, given coordinates for the line segment.	find the point on a directed line segment (between two given points) that partitions the segment in a given ratio.	construct a line segment that is partitioned in a given ratio.
	G.GPE.7	calculate the perimeter of a polygon.	calculate areas of a rectangle and right triangle given their coordinates.	calculate areas of any triangle given its coordinates.	calculate perimeters of polygons and areas of triangles and rectangles using their coordinates from a contextual problem.
Reporting Category / Domain		**Geometric Measurement and Dimension**			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster M - Explain volume formulas and use them to solve problems.	G.GMD.1	informally describe the formulas for the circumference and area of a circle.	informally describe the formulas for the volume of a cylinder, pyramid, and cone by the use of dissection arguments.	explain the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone.	justify the formulas for the circumference of a circle; area of a circle; and volume of a cylinder, pyramid, and cone.
	G.GMD.3	substitute given dimensions into the formulas for the volume of cylinders, pyramids, cones, and spheres.	compute the volume of cylinders, pyramids, cones, and spheres, given a graphic.	solve problems using the volume formulas for cylinders, pyramids, cones, and spheres.	find the volume of cylinders, pyramids, cones, and spheres in a real-life context.
Range PLD: Cluster N - Visualize relationships between two-dimensional and three-dimensional objects.	G.GMD.4	recognize two-dimensional polygons.	identify the vertical and/or horizontal two-dimensional cross-section of a three dimensional object.	identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	explain the relationship between a two-dimensional cross-section and a three-dimensional object.

Reporting Category / Domain		Modeling with Geometry			
Standard	**Benchmark**	**Below Basic students may or may not be able to:**	**Basic students:**	**Proficient students:**	**Advanced students:**
Range PLD: Cluster O - Applying geometric concepts in modeling situations.	G.MG.1	identify geometric shapes that model a real-world object.	use a geometric shape modeled in a simple real-world object to determine the appropriate measures.	use geometric shapes, measures, and properties to model and describe objects.	use composite geometric shapes, measures, and properties to model and describe objects.
	G.MG.2	calculate density based on area, when a formula is given.	calculate density based on volume (when a formula is given), and identify appropriate unit rates.	apply properties of density based on area and volume to model a situation in context.	compare and contrast density rates in a modeling context.
	G.MG.3	identify relevant geometric models for use in solving a design problem.	compare quantitatively different proposed solutions to a design problem, using geometric properties of the solution.	apply geometric methods to solve design problems.	design a composite structure to meet constraints and optimization requirements.