Secondary Curriculum Maps

Cumberland Valley School District

Soaring to Greatness, Committed to Excellence

6th Grade

Math

CVSD Math Curriculum Map ~ 6th Grade

PA Core Standard
CC.2.4.6.B.1 Use a set of numerical data to develop an understanding of and recognize statistical variability.
Taught in Unit(s)
Unit 6
Explanation/Example of Standard
Display, analyze, and summarize numerical data sets in relation to their context.
Common Misconceptions
• Students may confuse the various measures of center. • When finding median, students may forget to list the data in order from least to greatest, may be unsure what to do if two numbers are in the middle, or may cross off more numbers on one side than the other in finding the middle. • When finding mode, students may list the largest number rather than the piece of data appearing most frequently. • When reading a line plot or histogram to find mean or median, students may fail to account for all data. (For example, if three people surveyed gave an answer of 10, students may only include one 10 in their calculations.) • Many students need to be prompted to look at their answers to see if they make sense.

Big Idea(s)	Essential Question(s)
Some questions can be answered by collecting, representing, and analyzing data, and the question to be answered determines the data to be collected, how best to collect it, and how best to represent it. Numerical measures describe the center and spread of numerical data. http://www.pedsas.org/module/sas.curriculumframework/	• **How can you summarize numeric data?** • How can you use measures of center to describe a data set? • How can you describe variability in a set of data points using mean absolute deviation, range, and interquartile range? • **How can you display numeric data?** • How can you display data in a line plot, histogram, or box-and-whisker plot? • How can you describe any overall pattern and any deviations from the overall pattern?

Assessments
See unit map for specific unit common assessments

Assessment Anchor	Eligible Content	
M06.D-S.1 Demonstrate understanding of statistical variability by summarizing and describing distributions.	**M06.D-S.1.1.1**	Display numerical data in plots on a number line, including line plots, histograms, and box-and-whisker plots.
	M06.D-S.1.1.2	Determine quantitative measures of center (e.g., median, mean, mode) and variability (e.g., range, interquartile range, mean absolute deviation).
	M06.D-S.1.1.3	Describe any overall pattern and any deviations from the overall pattern with reference to the context in which the data were gathered.
	M06.D-S.1.1.4	Relate the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

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Concepts (what students need to know)	**Skills** (what students must be able to do)
Number line Line plots Histograms Box-and-whisker plots Quantitative measures of center Median Mean Mode Variability Range Interquartile range Mean absolute deviation Measures of center Data distribution	Display numerical data in plots on a number line Determine quantitative measure of center and variability Describe any overall pattern and any deviations from the overall pattern Relate the choice of measure of center and variability to the shape of the data distribution

CVSD Math Curriculum Map ~ 6th Grade

PA Core Standard
CC.2.3.7.A.1 Visualize and represent geometric figures and describe the relationships between them.
Taught in Unit(s)
Unit 5
Explanation/Example of Standard
Identify, use, and describe properties of angles and their measures. Determine circumference, area, surface area, and volume.
Common Misconceptions
● Students do not always recognize parallel lines when they are not horizontal on the paper or if there are additional line segments in the figure. ● Students sometimes confuse the formulas for circle area and circumference or may interchange radius and diameter when using the formulas. ● When finding surface area, students may need assistance in organizing their work in a manner that allows them to find the values that will be added together.

Big Idea(s)	Essential Question(s)
Understanding congruence, similarity, and part-to-whole relationships can help us to solve geometric problems.	● **How can you solve problems involving missing angle measures?** -How can you write equations to solve problems involving complementary, supplementary, and adjacent angles? -What can you conclude about the measures of the angles in a triangle? -What can you conclude about the angles formed by parallel lines that are cut by a transversal? ● **How can you find the area and circumference of a circle?** ● **How can you find the volume of cylinders, cones, prisms, pyramids, and spheres?** ● **How can you find the surface area of cylinders, cones, prisms, pyramids, and spheres?**

Assessments
See unit map for specific unit common assessments

Assessment Anchor	Eligible Content	
M07.C-G.2.1 Identify, use, and describe properties of angles and their measures.	**M07.C-G.2.1.1**	Identify and use properties of supplementary, complementary, and adjacent angles in a multistep problem to write and solve simple equations for an unknown angle in a figure.
	M07.C-G.2.1.2	Identify and use properties of angles formed when two parallel lines are cut by a transversal (e.g., angles may include alternate interior, alternate exterior, vertical, corresponding).
	M07.C-G.2.2.1	Find the area and circumference of a circle. Solve problems involving area and circumference of a circle(s). Formulas will be provided.

	M07.C-G.2.2.2	Solve real-world and mathematical problems involving area, volume, and surface area of two and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. Formulas will be provided.
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Concepts (what students need to know)	**Skills** (what students must be able to do)
Area, Volume, Angles, and Circumference	Use properties of angle types and properties of angles formed when two parallel lines are cut by a transversal line to solve problems. Solve problems involving area and circumference of a circle(s). Solve mathematical problems involving area, volume and surface area of two- and three-dimensional objects.

CVSD Math Curriculum Map ~ 6th Grade

PA Core Standard
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
Taught in Unit(s)
Unit 5
Explanation/Example of Standard
Find area, surface area, and volume by applying formulas and using various strategies.
Common Misconceptions
• Students may get confused which polygon area formulas require dividing by 2 and which do not. • After adding to a complex shape to create a known polygon, students may forget to subtract the area of the extra piece. After cutting a complex shape into pieces, students may incorrectly determine missing side lengths of the new polygons. • When finding the volume of a rectangular prism with fractional side lengths, students may forget to make mixed numbers into improper fractions. • When finding the surface area of prisms, students may incorrectly assume that all lateral faces are congruent.

Big Idea(s)	Essential Question(s)
Changing a figure into other shapes that we know (by cutting it, moving pieces, adding to it, etc.) can help us to find the figure's area and/or volume.	• **How do you find the area of polygons?** -How do you find the area of parallelograms, rhombuses, and trapezoids? -How do you find the area of triangles? -How do you find the area of complex polygons by composing or decomposing? -How do you find the distance between two points in the coordinate plane? -How do you find the area of polygons in the coordinate plane? • **How do you find the volume of right rectangular prisms?** • **How can you use nets to find the surface area of 3-dimensional figures?**

Assessments
See unit map for specific unit common assessments

Assessment Anchor	Eligible Content	
M06.C-G.1 Solve real-world and mathematical problems involving area, surface area, and volume.	**M06.C-G.1.1.1**	Determine the area of triangles and special quadrilaterals (i.e., square, rectangle, parallelogram, rhombus, and trapezoid). Formulas will be provided.
	M06.C-G.1.1.2	Determine the area of irregular or compound polygons. Example: Find the area of a room in the shape of an irregular polygon by composing and/or decomposing.
	M06.C-G.1.1.3	Determine the volume of right rectangular prisms with fractional edge lengths. Formulas will be provided.
	M06.C-G.1.1.4	Given coordinates for the vertices of a polygon in the plane, use the coordinates to find side lengths and area of the polygon (limited to triangles and special quadrilaterals). Formulas will be provided.

	M06.C-G.1.1.5	Represent three-dimensional figures using nets made of rectangles and triangles.
	M06.C-G.1.1.6	Determine the surface area of triangular and rectangular prisms (including cubes). Formulas will be provided.

Concepts (what students need to know)	**Skills** (what students must be able to do)
Area, Surface Area, and Volume	Find volumes of right rectangular prisms with fractional edge lengths. Use nets to find surface area of 3–dimensional figures. Determine the area of triangles, quadrilaterals, irregular polygons and compound polygons. Calculate the area of a polygon on a plane given the coordinates of the vertices.

CVSD Math Curriculum Map ~ 6th Grade

PA Core Standard	
CC.2.2.7.B.1 Apply properties of operations to generate equivalent expressions.	
Taught in Unit(s)	
Unit 4	
Explanation/Example of Standard	
Use properties of operations to generate equivalent expressions.	
Common Misconceptions	
• Students may not understand which terms are like terms and can be combined. • When students add/subtract like terms, they may change the exponents (e.g., $2x^2 + 3x^2 = 5x^4$ or $5x - x = 5$). • When an expression with like terms includes subtraction, students may forget to treat the term as negative. • When converting from factored to expanded form, students may distribute the factor outside the parentheses to the first term only. For example, they may say that ¼ (x+8) = ¼ x+8 rather than ¼ x+2.	
Big Idea(s)	**Essential Question(s)**
Expressions can represent mathematical situations. There are some mathematical relationships that are always true. These relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities. http://www.pedsas.org/module/sas.curriculumframework/	• **How can you generate equivalent algebraic expressions and use them to solve real-world problems?** -How can you model and write algebraic expressions that include rational coefficients? -How can you use the order of operations to evaluate algebraic expressions that include rational coefficients? • **How do you apply the commutative, associative, and distributive properties to simplify expressions that include rational coefficients?**
Assessments	
See unit map for specific unit common assessments	

Assessment Anchor	Eligible Content	
M07.B-E.1 Represent expressions in equivalent forms.	**M07.B-E.1.1.1**	Apply properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients. Example 1: The expression ½ • (x+6) is equivalent to ½ •x + 3. Example 2: The expression 5.3 – y +4.2 is equivalent to 9.5 – y (or –y + 9.5). Example 3: The expression 4w – 10 is equivalent to 2(2w – 5).

Concepts (what students need to know)	Skills (what students must be able to do)
Algebraic Expressions	Apply properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients.

CVSD Math Curriculum Map ~ 6th Grade

PA Core Standard	
CC.2.2.6.B.3 Represent and analyze quantitative relationships between dependent and independent variables.	
Taught in Unit(s)	
Unit 4	
Explanation/Example of Standard	
Use variables to represent two quantities in a real-world problem that change in relationship to one another.	
Common Misconceptions	
● Students may get confused about whether to move vertically or horizontally first when plotting points. Students may also be unsure where to find the negative integers on a coordinate plane. Students who have only plotted points with positive coordinates may start counting at the lower-left corner of their graph rather than at the origin. Sometimes students count spaces rather than lines and place a point with integer coordinates in the middle of a block. ● When creating a table for an equation in the form y=mx+b, students may mistakenly place their y-values in the left-hand column of the table because y is on the left side of the equation while x is on the right side. ● When asked to find missing values in an x-y table, students may incorrectly assume that the change in x is consistent (for example, that the x-value will increase by one each time) and will fill in the values accordingly.	
Big Idea(s)	**Essential Question(s)**
Relations and functions are mathematical relationships that can be represented and analyzed using words, tables, graphs, and equations. http://www.pedsas.org/module/sas.curriculumframework/	● **How can you use relationships in two variables to solve real-world problems?** -How do you locate and name points in the coordinate plane? -How can you identify independent and dependent quantities from tables and graphs? -How can you use an equation to show a relationship between the two variables? -How can you use verbal descriptions, tables, and graphs to represent algebraic relationships?
Assessments	
See unit map for specific unit common assessments	

Assessment Anchor	Eligible Content	
M06.B-E.3 Represent and analyze quantitative relationships between dependent and independent variables.	**M06.B-E.3.1.1**	Write an equation to express the relationship between the dependent and independent variables. Example: in a problem involving motion at a constant speed of 65 units, write the equation d = 65t to represent the relationship between distance and time.
	M06.B-E.3.1.2	Analyze the relationship between the dependent and independent variables using graphs and tables and/or relate these to an equation.

Concepts (what students need to know)	**Skills** (what students must be able to do)
Algebraic Expressions	Represent and analyze quantitative relationships between independent and

Algebraic Equations	dependent variables.

CVSD Math Curriculum Map ~ 6th Grade

PA Core Standard

CC.2.2.6.B.2 Understand the process of solving a one-variable equation or inequality and apply to real-world and mathematical problems.

Taught in Unit(s)

Unit 4

Explanation/Example of Standard

Create, solve, and interpret one variable equations or inequalities in real-world and mathematical problems.

Common Misconceptions

- Students may not remember that *3m* means "3 times m" or that *n/4* means "n divided by 4."
- In comparing two integers, students may look at the absolute value of the integer rather than the integer itself. For example, students may think that -10>3.
- When converting a situation described in words into an equation, students may need assistance in identifying the relevant details and simplifying them into an understandable form.

Big Idea(s)	Essential Question(s)
Numbers, measures, expressions, equations, and inequalities can represent mathematical situations and structures in many equivalent forms. There are some mathematical relationships that are always true and these relationships are used as the rules of arithmetic and algebra. They are useful for writing equivalent forms of expressions and solving equations and inequalities. http://www.pedsas.org/module/sas.curriculumframework/	• **How can you use equations and relationships to solve real-world problems?** -How do you write equations and determine whether a number is a solution of an equation? -How do you solve equations that contain addition or subtraction? -How do you solve equations that contain multiplication or division? -How can you use inequalities to represent real-world constraints or conditions?

Assessments

See unit map for specific unit common assessments

Assessment Anchor	Eligible Content	
M06.B-E.2 Interpret and solve one-variable equations and inequalities.	**M06.B-E.2.1.1**	Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
	M06.B-E.2.1.2	Write algebraic expressions to represent real-world or mathematical problems.
	M06.B-E.2.1.3	Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q, and x are all non-negative rational numbers.
	M06.B-E.2.1.4	Write an inequality of the form x>c or x<c to represent a constraint or condition in a real-world or mathematical problem and/or represent solutions of such inequalities on number lines.

Concepts (what students need to know)	**Skills** (what students must be able to do)

Algebraic Equations	Solve and interpret one variable equations or inequalities in real world and mathematical problems.

CVSD Math Curriculum Map ~ 6th Grade

PA Core Standard
CC.2.2.6.B.1 Apply and extend previous understandings of arithmetic to algebraic expressions.
Taught in Unit(s)
Unit 4
Explanation/Example of Standard
Identify, write, and evaluate numerical and algebraic expressions.
Common Misconceptions
• In writing expressions involving subtraction or division (e.g., expressing the description "five less than twice a number" as 2y – 5.), students forget that subtraction and division are not commutative and are not careful to use the correct order. • In evaluating expressions with exponents, students may confuse the meaning of the base and the exponent and say, for example, that $2^3 = 9$ rather than 8. • When evaluating expressions with exponents, students may multiply the base and exponent (stating that $2^3 = 6$ rather than 8.). • When evaluating expressions, students may need to be reminded to use order of operations. • When converting from factored to expanded form, students may distribute the factor outside the parentheses to the first term only. For example, they may say that 4(x+3) = 4x+3 rather than 4x+12. • When converting from expanded to factored form, students may not use the GCF. For example, they may factor 24x + 18y as 2(12x+9y). • Students sometimes think that $y+y+y = y^3$ rather than 3y.

Big Idea(s)	Essential Question(s)
Expressions can represent mathematical situations. There are some mathematical relationships that are always true. These relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities. http://www.pedsas.org/module/sas.curriculumframework/	• **How can you generate equivalent numeric expressions and use them to solve real-world problems?** -How do you use exponents to represent numbers? -How do you write the prime factorization of a number? -How do you use the order of operations to simplify an expression with exponents? • **How can you generate equivalent algebraic expressions and use them to solve real-world problems?** -How can you model and write algebraic expressions? -How can you use the order of operations to evaluate algebraic expressions? • **How do you apply the commutative, associative, and distributive properties to show expressions are equivalent?**

Assessments
See unit map for specific unit common assessments

Assessment Anchor	Eligible Content	
M06.B-E.1 Apply and extend previous understandings of arithmetic to numerical and	**M06.B-E.1.1.1**	Write and evaluate numerical expressions involving whole-number exponents.
	M06.B-E.1.1.2	Write algebraic expressions from verbal descriptions.

algebraic expressions.		Example: Express the description “five less than twice a number” as 2y – 5.
	M06.B-E.1.1.3	Identify parts of an expression using mathematical terms (e.g., sum, term, product, factor, quotient, coefficient, quantity). Example: Describe the expression 2(8 + 7) as a product of two factors.
	M06.B-E.1.1.4	Evaluate expressions at specific values of their variables, including expressions that arise from formulas used in real-world problems. Example: Evaluate the expression b^2- 5 when b = 4.
	M06.B-E.1.1.5	Apply the properties of operations to generate equivalent expressions. Example 1: Apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x. Example 2: Apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6(4x + 3y). Example 3: Apply properties of operations to y + y + y to produce the equivalent expression 3y.

Concepts (what students need to know)	**Skills** (what students must be able to do)
Algebraic Expressions	Write, identify and evaluate numerical expressions involving exponents. Write, read and evaluate algebraic expressions. Apply the properties of operations to generate equivalent expressions.

CVSD Math Curriculum Map ~ 6th Grade

PA Core Standard
CC.2.1.7.E.1 Apply and extend previous understandings of operations with fractions to operations with rational numbers.
Taught in Unit(s)
Unit 2
Explanation/Example of Standard
Solve real-world and mathematical problems involving the four operations with rational numbers.
Common Misconceptions
● Students may apply the rules for positive integers to negative integers (the further from zero the larger the value). ● When labeling a number line students may have difficulty going below zero. ● In the discussion of positive integers and their opposites, students may need reminded that zero is its own opposite (it is neither positive or negative). ● As students work to compare integers and rational numbers they may be confused about what inequality symbol to use (the opening points towards the larger value). They may also need reminded that negative integers work opposite of positives when being compared. ● During the translating of problems, students may forget to bring the negative symbols. ● When finding absolute value, there may confusion when dealing with positive numbers. Absolute value is always a distance and distance cannot be negative, therefore absolute value of a negative integer is always a positive value. ● When setting up problems, students may not keep values line up as they are working, emphasize the need to keep work organized and provide grid paper if helpful. ● In division, students may switch the divisor and dividend when translating the problem. ● Students may not line up decimals when adding and subtracting, therefore not having the place values lined up in the problem. ● When multiplying decimals, instead of sliding the decimal over in the product, they may try to bring the decimal down from where it was in the factor/factors. They may also slide from the wrong direction move right instead of left). ● Students may assume that dividing fractions is like dividing whole numbers, the answer must be a smaller value. However, depending on the divisor and dividend, the quotient may be larger than either value. ● When rewriting the division problem as multiplication, students may confuse the divisor and dividend which would cause them to write the reciprocal of the incorrect fraction. ● Before writing the problem as multiplication, students may cross out common factors diagonally (instead of using this method after the problem was rewritten).

Big Idea(s)	Essential Question(s)
By applying rules and properties of operations with rational numbers (fractions, decimals, integers, etc.), solve real world problem.	● **How can you use rational numbers to solve real world problems?** ● How do you classify rational numbers? ● **How can you use operations with fractions to solve real world problems?** ● How do you use GCF and LCM when adding, subtracting, multiplying, and dividing fractions? ● How do you divide fractions and mixed numbers? ● **How can you use decimals to solve real world problems?** ● How do you add and subtract decimals? ● How do you multiply decimals? ● How do you divide decimals?

<table>
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<tr><th colspan="2">Assessments</th></tr>
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<table>
<tr><th>Assessment Anchor</th><th colspan="2">Eligible Content</th></tr>
<tr><td rowspan="3">M07.A-N.1 Apply and extend previous understandings of operations to add, subtract, multiply, and divide rational numbers.</td><td>M07.A-N.1.1.1</td><td>Apply properties of operations to add and subtract rational numbers, including real-world contexts.</td></tr>
<tr><td>M07.A-N.1.1.2</td><td>Represent addition and subtraction on a horizontal or vertical number line.</td></tr>
<tr><td>M07.A-N.1.1.3</td><td>Apply properties of operations to multiply and divide rational numbers, including real-world contexts; demonstrate that the decimal form of a rational number terminates or eventually repeats.</td></tr>
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<table>
<tr><th>Concepts
(what students need to know)</th><th>Skills
(what students must be able to do)</th></tr>
<tr><td>Integers and Other Rational Numbers</td><td>Interpret and compute quotients of fraction.

Solve problems and compute fluently with whole numbers and decimals.

Find common multiples and factors including greatest common factor and least common multiple.</td></tr>
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CVSD Math Curriculum Map ~ 6th Grade

PA Core Standard
CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
Taught in Unit(s)
Unit 1
Explanation/Example of Standard
Analyze, recognize, and represent proportional relationships and use them to solve real-world and mathematical problems.
Common Misconceptions
• When writing proportions, students may incorrectly set up the problem by not lining up the labels correctly. • In conversion problems, students may reverse the given conversion rate.

Big Idea(s)	Essential Question(s)
Proportions and proportional relationship can be used to solve real-world problems (unit rate, unit cost, percents, etc.) through a variety of methods and models.	• **How can you use proportions to solve real-world problems?** • How can you represent real-world problems and relationships involving ratios, unit rates and proportions with tables, diagrams and graphs? • How can you solve problems with proportions? • How can you use proportions to represent and solve percent problems, fractional situations and multi-step ratio problems? • How do you use proportions to convert measurements? • How can you use equations and coordinate graphs to represent proportion relationships and problems?

Assessments
See unit map for specific unit common assessments

Assessment Anchor	Eligible Content	
M07.A-R.1 Demonstrate an understanding of proportional relationships.	**M07.A-R.1.1.1**	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. Example: If a person walks ½ mile in each ¼ hour, compute the unit rate as the complex fraction ½ / ¼ miles per hour, equivalently 2 miles per hour.
	M07.A-R.1.1.2	Determine whether two quantities are proportionally related (e.g., by testing for equivalent ratios in a table, graphing on a coordinate plane and observing whether the graph is a straight line through the origin).
	M07.A-R.1.1.3	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
	M07.A-R.1.1.4	Represent proportional relationships by equations. Example: If total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be

		expressed as t = pn.
	M07.A-R.1.1.5	Explain what a point (x,y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r), where r is the unit rate.
	M07.A-R.1.1.6	Use proportional relationships to solve multi-step ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease.

Concepts (what students need to know)	**Skills** (what students must be able to do)
Ratios, Proportions, and Percent	Compute unit rates associated with ratios of fractions. Recognize and represent proportional relationships between quantities. Use proportional relationships to solve multistep ratio and percent problems.

I Can Statements

CVSD Math Curriculum Map ~ 6th Grade

PA Core Standard
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
Taught in Unit(s)
Unit 3
Explanation/Example of Standard
Understand that positive and negative numbers are used together to describe quantities having opposite directions or values and location on the number line and coordinate plane. Understand ordering and absolute value of rational numbers.
Common Misconceptions
• Students may apply the rules for positive integers to negative integers (the further from zero the larger the value). • When labeling a number line students may have difficulty going below zero. • In the discussion of positive integers and their opposites, students may need reminded that zero is its own opposite (it is neither positive or negative). • As students work to compare integers and rational numbers they may be confused about what inequality symbol to use (the opening points towards the larger value). They may also need reminded that negative integers work opposite of positives when being compared. • During the translating of problems, students may forget to bring the negative symbols. • When finding absolute value, there may confusion when dealing with positive numbers. Absolute value is always a distance and distance cannot be negative, therefore absolute value of a negative integer is always a positive value.

Big Idea(s)	Essential Question(s)
Integers and Rational Numbers can be used to represent real-world situations through various methods (graphs, number lines, etc.) Understanding integers and their appropriate representations will aid in the conceptualization of other mathematical concepts (comparing values, absolute value, graphing, number lines, real-world problems.	• **How can you use integers to solve real world problems?** • How do you identify an integer and its opposite? • How do you compare and order integers? • How do you find absolute value? • **How can you use rational numbers to solve real world problems?** • How do you classify rational numbers? • How can you identify opposites and absolute value of rational numbers? • How do you compare and order rational numbers?

Assessments
See unit map for specific unit common assessments

Assessment Anchor	Eligible Content	
M06.A-N.3 Apply and extend previous understandings of numbers to the system of rational numbers.	**M06.A-N.3.1.1**	Represent quantities in real-world contexts using positive and negative numbers, explaining the meaning of 0 in each situation (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge).
	M06.A-N.3.1.2	Determine the opposite of a number and recognize that the opposite of the opposite of a number is the number itself (e.g., -(-3) = 3; 0 is its own opposite).
	M06.A-N.3.1.3	Locate and plot integers and other rational numbers on a horizontal or vertical number line; locate and plot pairs of

		integers and other rational numbers on a coordinate plane.
	M06.A-N.3.2.1	Write, interpret, and explain statements of order for rational numbers in real-world contexts. Example: Write -3˚C > -7˚C to express the fact that -3˚C is warmer than -7˚C.
	M06.A-N.3.2.2	Interpret the absolute value of a rational number as its distance from 0 on the number line and as a magnitude for a positive or negative quantity in a real-world situation. Example: For an account balance of -30 dollars, write |-30| = 30 to describe the size of the debt in dollars, and recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.
	M06.A-N.3.2.3	Solve real-world and mathematical problems by plotting points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Concepts (what students need to know)	**Skills** (what students must be able to do)
Integers and Other Rational Numbers	Interpret and compute quotients of fraction. Solve problems and compute fluently with whole numbers and decimals. Find common multiples and factors including greatest common factor and least common multiple.

CVSD Math Curriculum Map ~ 6th Grade

PA Core Standard
CC.2.1.6.E.3 Develop and/or apply number theory concepts to find common factors and multiples.
Taught in Unit(s)
Unit 2
Explanation/Example of Standard
Compute with multi-digit numbers using the four arithmetic operations with or without a calculator. Apply number theory concepts (specifically, factors and multiples).
Common Misconceptions
• Students may misuse the terms factor (smaller or equal to the value) and multiple (greater or equal to the value) by reversing their meanings. Make sure they focus on the words factor and multiple when completing problems involving GCF and LCM. • For some problems, students may settle to find any common factor or multiple instead of the GCF and LCM

Big Idea(s)	Essential Question(s)
Understand the importance of common factors and common multiples and their relationship to computation	• **How can you use greatest common factor and least common multiple to solve real world problems?** • How can you find and use the greatest common factor of two whole numbers? • How can you find and use the least common multiple of two whole numbers? •

Assessments
See unit map for specific unit common assessments

Assessment Anchor	Eligible Content	
M06.A-N.2 Compute with multi-digit numbers and find common factors and multiples.	**M06.A-N.2.1.1**	Solve problems involving operations (+, -, x, and ÷) with whole numbers, decimals (through thousandths), straight computation, or word problems.
	M06.A-N.2.2.1	Find 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.
	M06.A-N.2.2.2	Apply the distributive property to express a sum of two whole numbers, 1 through 100, with a common factor as a multiple of a sum of two whole numbers with no common factor. Example: Express 36 + 8 as 4(9 + 2)

Concepts (what students need to know)	**Skills** (what students must be able to do)
Number Theory Concepts and Operations	Find common multiples and factors including greatest common factor and least common multiple. Use the distributive property to express a sum of two numbers.

CVSD Math Curriculum Map ~ 6th Grade

PA Core Standard		
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.		
Taught in Unit(s)		
Unit 2		
Explanation/Example of Standard		
Compute with multi-digit numbers using the four arithmetic operations with or without a calculator. Apply number theory concepts (specifically, factors and multiples).		
Common Misconceptions		
● When setting up problems, students may not keep values line up as they are working, emphasize the need to keep work organized and provide grid paper if helpful. ● In division, students may switch the divisor and dividend when translating the problem. ● Students may not line up decimals when adding and subtracting, therefore not having the place values lined up in the problem. ● When multiplying decimals, instead of sliding the decimal over in the product, they may try to bring the decimal down from where it was in the factor/factors. They may also slide from the wrong direction move right instead of left).		

Big Idea(s)	Essential Question(s)
Apply rules for operations with whole numbers and decimals to solve computation and read world problems	● **How can you use operations with whole numbers and decimals to solve real world problems?** ● How do you add, subtract, multiply, and divide whole numbers? ● How do you add, subtract, multiply, and divide decimals?

Assessments
See unit map for specific unit common assessments

Assessment Anchor	Eligible Content	
M06.A-N Compute with multi-digit numbers and find common factors and multiples.	**M06.A-N.2.1.1**	Solve problems involving operations (+, -, x, and ÷) with whole numbers, decimals (through thousandths), straight computation, or word problems.
	M06.A-N.2.2.1	Find 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.
	M06.A-N.2.2.2	Apply the distributive property to express a sum of two whole numbers, 1 through 100, with a common factor as a multiple of a sum of two numbers with no common factor. Example: Express 36 + 8 as 4(9+2).

Concepts (what students need to know)	Skills (what students must be able to do)
Number Theory Concepts and Operations	Solve problems and compute fluently with whole numbers and decimals.

CVSD Math Curriculum Map ~ 6th Grade

<table>
<tr><th colspan="3">PA Core Standard</th></tr>
<tr><td colspan="3">CC.2.1.6.E.1 Apply and extend previous understandings of multiplication and division to divide fractions by fractions.</td></tr>
<tr><th colspan="3">Taught in Unit(s)</th></tr>
<tr><td colspan="3">Unit 2</td></tr>
<tr><th colspan="3">Explanation/Example of Standard</th></tr>
<tr><td colspan="3">Solve real-world and mathematical problems involving division of fractions.</td></tr>
<tr><th colspan="3">Common Misconceptions</th></tr>
<tr><td colspan="3">Students may assume that dividing fractions is like dividing whole numbers, the answer must be a smaller value. However, depending on the divisor and dividend, the quotient may be larger than either value.
When rewriting the division problem as multiplication, students may confuse the divisor and dividend which would cause them to write the reciprocal of the incorrect fraction.
Before writing the problem as multiplication, students may cross out common factors diagonally (instead of using this method after the problem was rewritten).</td></tr>
<tr><th>Big Idea(s)</th><th colspan="2">Essential Question(s)</th></tr>
<tr><td>Through the use of multiplication and division skills, solve problems (including word problems) involving dividing a fraction by a fraction.</td><td colspan="2">How do you divide fractions and mixed numbers?
How do you solve word problems by dividing fractions?</td></tr>
<tr><th colspan="3">Assessments</th></tr>
<tr><td colspan="3">See unit map for specific unit common assessments</td></tr>
<tr><th>Assessment Anchor</th><th colspan="2">Eligible Content</th></tr>
<tr><td>M06.A-N.1 Apply and extend previous understandings of multiplication and division to divide fractions by fractions.</td><td>M06.A-N.1.1.1</td><td>Interpret and compute quotients of fractions (including mixed numbers), and solve word problems involving division of fractions by fractions. Example 1: Given a story context for (2/3) ÷ (3/4), explain that (2/3) ÷ (3/4) = 8/9 because ¾ of 8/9 is 2/3. (In general, (a/b) ÷(c/d) = (a/b) ÷(d/c) = ad/bc.) Example 2: How wide is a rectangular strip of land with length ¾ mi and area ½ square mi? Example 3: How many 2 ¼-foot pieces can be cut from a 15 ½-foot board?</td></tr>
<tr><th>Concepts
(what students need to know)</th><th colspan="2">Skills
(what students must be able to do)</th></tr>
<tr><td>Number Theory Concepts and Operations</td><td colspan="2">Interpret and compute quotients of fractions.</td></tr>
</table>

CVSD Math Curriculum Map ~ 6th Grade

PA Core Standard
CC.2.1.6.D.1 Understand ratio concepts and use ratio reasoning to solve problems.
Taught in Unit(s)
Unit 1
Explanation/Example of Standard
Represent and/or solve real world and mathematical problems using rates, ratios, and/or percents.
Common Misconceptions
• When writing a ratio of comparison, students may forget that the order of the numbers in the numerator and denominator matter (ex: ratio of boys (14) to girls (16) must be written in that order with 14 as the numerator and 16 as the denominator). • To find equivalent ratios, students may multiply or divide only the numerator **or** denominator instead of both. • Students may confuse fractions (part-to-whole comparison) with ratios (part-to-whole and/or part-to-part comparison). • In understanding percentages, students may believe that values must be between 1% and 100%, however they can be greater than 100% and less than 1% • When writing proportions, students may not line up labels correctly (they must be the same within the ratio or horizontally across from each other).

Big Idea(s)	Essential Question(s)
Use proportional reasoning to solve problems using knowledge of multiplication/division, ratio language and rates via tape diagrams, tables, double number lines and equations.	• **How can you use ratios and rates to solve real world problems?** • How do you use ratios to compare quantities? • How do you use rates to compare quantities? • How do ratios and rates help make comparisons and predictions? • How can you represent real-world problems involving ratios and rates with tables and graphs? • How can you use proportions to solve problems with ratios and rates? • **How can you use percents to solve real world problems?** • How can you write ratios as percents? • How do you use percents to solve problems?

Assessments
See unit map for specific unit common assessments

Assessment Anchor	Eligible Content	
M06.A-R.1 Understand ratio concepts and use ratio reasoning to solve problems.	**M06.A-R.1.1.1**	Use ratio language and notation (such as 3 to 4, 3:4, ¾) to describe a ratio relationship between two quantities. Example 1: “The ratio of girls to boys in a math class is 2:3 because for every 2 girls there are 3 boys.” Example 2: “For every five votes candidate A received, candidate B received four votes.”
	M06.A-R.1.1.2	Find the unit rate a/b associated with a ratio a:b (with b≠0) and use rate language in the context of a ratio relationship. Example 1: “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is ¾ cup of flour for

		each cup of sugar." Example 2: "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."
	M06.A-R.1.1.3	Construct tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and/or plot the pairs of values on the coordinate plane. Use tables to compare ratios.
	M06.A-R.1.1.4	Solve unit rate problems including those involving unit pricing and constant speed. Example: If it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?
	M06.A-R.1.1.5	Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percentage.

Concepts (what students need to know)	**Skills** (what students must be able to do)
Ratios Proportions Percents	Represent ratio relationships in various forms Determine unit rates in context Convert measurement units using equivalent ratios Solve problems using ratio and rate reasoning