

6th GRADE MATHEMATICS 2018-2019

Year-at-a-Glance

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Ratios and Unit Rates	Arithmetic Operations Including Division of Fractions	Rational Numbers	Expressions and Equations	Area, Surface Area, Volume Problems	Statistics
Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
Instruction: 30 days	Instruction: 20 days	Instruction: 20 days	Instruction: 40 days	Instruction: 20 days	Instruction: 20 days
<ul style="list-style-type: none"> ● Proportional relationships ● Equivalent ratios ● Unit rates ● Percent ● Measurement conversions ● Rate tables ● Tape diagrams ● Ratio and rate language 	<ul style="list-style-type: none"> ● Decimals and Fraction <ul style="list-style-type: none"> ○ Add ○ Subtract ○ Multiply ○ Divide ● Distributive Property <ul style="list-style-type: none"> ○ Factor ○ Distribute ● Factor Pairs ● Composite Number ● Prime Number ● Reciprocal ● Multiples ● Equivalent Fraction ● GCF ● LCM 	<ul style="list-style-type: none"> ● Number Line <ul style="list-style-type: none"> ○ Positive ○ Negative ● Coordinate Plane <ul style="list-style-type: none"> ○ Ordered Pair ○ Quadrants ● Inequalities ● Absolute Value ● Opposites ● Independent Variable ● Dependent Variable ● Integers 	<ul style="list-style-type: none"> ● Expressions with variables <ul style="list-style-type: none"> ○ Write ○ Read ○ Evaluate ● Identify parts of expressions <ul style="list-style-type: none"> ○ Sum ○ Term ○ Product ○ Factor ○ Quotient ○ Coefficient ● Solve <ul style="list-style-type: none"> ○ Equations ○ inequalities ● Graphs ● Equations ● Tables 	<ul style="list-style-type: none"> ● Area <ul style="list-style-type: none"> ○ Triangles ○ Quadrilaterals ○ Polygons ● Coordinate Plane <ul style="list-style-type: none"> ○ Distance ○ Draw Polygon ○ Area ○ Perimeter ● Volume <ul style="list-style-type: none"> ○ With Fraction ● Nets made of Triangles and Rectangles <ul style="list-style-type: none"> ○ Construct ○ Find surface area 	<ul style="list-style-type: none"> ● Measures of Center <ul style="list-style-type: none"> ○ Mean ○ Median ○ Mode ● Measures of Variation <ul style="list-style-type: none"> ○ Range ○ Mean Absolute Deviation ○ Interquartile range ● Statistical question ● Distribution of data ● Numerical Data <ul style="list-style-type: none"> ○ Number line ○ Box plots ○ Dot plots ○ Histograms

COLOR KEY:

BLUE - Power Standard

BLACK - Additional Skills

RED - Closing the Achievement Gap

Green - Familiarity Only

[Unit 1](#)

[Unit 2](#)

[Unit 3](#)

[Unit 4](#)

[Unit 5](#)

[Unit 6](#)

Unit 1	Ratios and Unit Rates:	Grade Level	6	Approx length	31 days
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CPSD Power Standards with Student Learning Objectives

6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems (e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations): Use and create tables to compare equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane; Solve unit rate problems including those involving unit pricing and constant speed; 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 percent; Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities Note: Conversion factors will be given. Conversions can occur both between and across the metric and English system. Estimates are not expected.

Student-Friendly Objectives:

- I can use and create tables to compare equivalent ratios, find missing values, and plot pairs of values on the coordinate plane.
- I can create or interpret a model to solve real-world problems involving ratio and rate.
- I can solve unit rate problems including those involving unit pricing and constant speed.
- I can find a percent of a quantity as a rate per 100.
- I can solve problems involving finding the whole, given a part and the percent.
- I can use ratio reasoning to convert measurement units.

Learning Indicators of Power Standards

Students will know...

- Ratio is a comparison of two quantities by division
- Equivalent ratios are generated using a scale factor, similar to generating equivalent fractions
- Unit rate is an amount *per one*
- Percent is a rate *per 100*
- Conversions (Customary and metric)

And be able to...

- Determine if two or more ratios are equivalent.
- Use and create tables to compare equivalent ratios, find missing values, and plot pairs of values on the coordinate plane.
- Determine both unit rates for a given rate.
- Solve unit rate problems including those involving unit pricing and constant speed.
- Find a percent of a quantity as a rate per 100.
- Solve problems when given a whole, part, or percent.
- Use ratio reasoning to convert a metric measurement within the metric system.
- Use ratio reasoning to convert a customary measurement within the

customary system.

Additional Arkansas State Standards

- 6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*
- 6.RP.A.2 Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. *For example "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $\frac{3}{4}$ cup of flour for each cup of sugar." "We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger."*

Unit 2	Arithmetic operations including division of fractions:	Grade Level	6	Approx Length	23 days
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CPSD Power Standards with Student Learning Objectives

6.NS.B.3 Use computational fluency to add, subtract, multiply, and divide multi-digit decimals and fractions using a standard algorithm for each operation

Student-Friendly Objectives:

- I can perform operations on multi-digit rational numbers.
- I can convert between various forms of fractions.

Learning Indicators of Power Standards

<p>Students will know...</p> <ul style="list-style-type: none"> • Properties of operation • Multiple strategies can be used to solve problems involving operations with fractions • Fact families • Decimals are fractions with denominators that are power of 10 • Numbers can be decomposed in useful ways 	<p>And be able to...</p> <ul style="list-style-type: none"> • Estimate appropriately given the operation and situation. • Recognize which operation is best in solving the problem. • Convert between various forms of fractions. • Create and convert between models to represent fraction situations. • Find common denominators to add and subtract fractions. • Compute with rational numbers (fractions and decimals) using models and standard algorithms.
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Additional Arkansas State Standards

- 6.NS.A.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for $(\frac{2}{3}) \div (\frac{3}{4})$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(\frac{2}{3}) \div (\frac{3}{4}) = \frac{8}{9}$ because $\frac{3}{4}$ of $\frac{8}{9}$ is $\frac{2}{3}$. How much chocolate will each person get if 3 people share $\frac{1}{2}$ lb of chocolate equally? How many $\frac{3}{4}$ -cup servings are in $\frac{2}{3}$ of a cup of yogurt? How wide is a rectangular strip of land with length $\frac{3}{4}$ mi and area $\frac{1}{2}$ square mi?*
- 6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm.
- 6.NS.B.4 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. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express $36 + 8$ as $4(9 + 2)$.*

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Unit 3	Rational Numbers:	Grade Level	6	Approx Length	28 days
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CPSD Power Standards with Student Learning Objectives

6.NS.C.6a Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates: Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; Recognize that the opposite of the opposite of a number is the number itself; Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes; Find and position integers and other rational numbers on a horizontal or vertical number line diagram; Find and position pairs of integers and other rational numbers on a coordinate plane.

Student-Friendly Objectives:

- I can recognize opposite values on a number line.
- I can recognize that the opposite of the opposite of a number is the number itself.
- I can determine a quadrant from an ordered pair.
- I can recognize how and why reflections occur.
- I can locate and plot numbers on a number line and pairs of numbers on a coordinate plane.

6.NS.C.7 Understand ordering and absolute value of rational numbers: Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram; Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write $-3^{\circ}\text{C} > -7^{\circ}\text{C}$ to express the fact that -3°C is warmer than -7°C ; Understand the absolute value of a rational number as its distance from 0 on the number line; Interpret absolute value as magnitude for a positive or negative quantity in a real-world situation; Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.

Student-Friendly Objectives:

- I can explain the absolute value of a number.
- I can write, interpret and explain inequalities using rational numbers.
- I can order rational numbers in everyday situations.
- I can use absolute value in everyday situations.

Learning Indicators of Power Standards

Students will know...

- The coordinate plane is the intersection of perpendicular lines intersecting at the origin
- Each point on the plane has unique coordinates
- The coordinate grid may be divided into 4 quadrants
- Each number has a unique opposite
- The sign of a number indicates direction
- The signs of numbers in ordered pairs indicate locations in quadrants of the coordinate plane
- Absolute value is a number's distance from 0
- Statements of inequality describe the relative position of two numbers on a number line
- The sign of a number determines its direction and the absolute value determines its magnitude

And be able to...

- Determine opposite values on a number line.
- Recognize that the opposite of the opposite is the number itself (e.g. $-(-3)$ is 3).
- Generalize the signs of the x - and y -coordinates in the four quadrants.
- Recognize the reflections that occur when the signs are changed in an ordered pair (e.g. $(3,2), (-3,2)$ is a reflection across the y -axis, $(3, 2), (3, -2)$ is a reflection across the x -axis, and $(3, 2), (-3, -2)$ is a reflection across both).
- Locate and plot numbers on a number line and pairs on a coordinate plane.
- Explain the absolute value of a number.
- Compare two numbers using a number line and assign an appropriate inequality sign.
- Order rational numbers in context.
- Apply absolute value to solve and *interpret* real world problems.

Additional Arkansas State Standards

- 6.NS.C.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
- 6.NS.C.8 Solve real-world and mathematical problems by graphing 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.

Week 6: December 17-21

Flexible (catch up/remediation/Aspire review/Teacher Choice)

Unit 4	Expressions and Equations	Grade Level	6	Approx Length	39
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CPSD Power Standards with Student Learning Objectives

6.EE.A.2a Write, read, and evaluate expressions in which letters stand for numbers: Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation ‘subtract y from 5’ or ‘ y less than 5’ as $5 - y$; Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms; Evaluate expressions at specific values of their variables - Include expressions that arise from formulas used in real-world problems; Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas involved in measurement such as $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.

Student-Friendly Objectives:

- I can write expressions with numbers and with letters standing for numbers (variables).
- I can solve problems with exponents.
- I can identify parts of an expression.
- I can use a specific value for a variable to evaluate an expression.
- I can use order of operations effectively.

6.EE.A.3 Apply the properties of operations to generate equivalent expressions.

Student-Friendly Objectives:

- I can use properties to show that expressions have the same value (equivalent).
- I can factor simple expressions by identifying the GCF.

6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another: Write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable; Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example: In a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.

Student-Friendly Objectives:

- I can write an equation using independent and dependent variables.

- I can show variable relationships related to tables, graphs, and/or equations.

Learning Indicators of Power Standards

Students will know...

- Exponents are repeated multiplication
- Operators: sum, product, difference, quotient
- Parts: variables, coefficient, term, exponent, base
- Properties of operations
 - distributive property
 - Expanded form
 - Factored form
 - Greatest Common Factor (GCF)
 - commutative property
 - associative property
 - Identity and inverse properties
- Equivalent expressions can be simplified to the same form
- The meaning of “combining like terms”
- A change in one variable will result in the change of the other variable.
- create equations
- The dependent variable is affected by the independent variable

And be able to...

- Write expressions from word problems by determining the operation, numbers and variables or letters standing for numbers that are unknown.
- Identify parts of an expression using mathematical terms: sum, term, product, factor, quotient, coefficient.
- Use a specific value for a variable to evaluate the expression.
- Use order of operations effectively in solving problems.
- Model and write the factored and expanded form of an expression to show the distributive property
- Factor simple expressions by identifying the GCF.
- Use the commutative property to arrange and reorder addition and multiplication.
- Use the associative property to group more than two terms dealing with addition and multiplication.
- Apply the identity and inverse properties.
- Identify and name the variables with consideration of their restrictions (i.e., distance will only be positive).
- Write an equation with a dependent variable and a independent variable
- Show how variables are related using tables, graphs, and/or equations.

Additional Arkansas State Standards

- 6.EE.A.1 Write and evaluate numerical expression involving whole-number exponents.
- 6.EE.A.4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.*
- 6.EE.B.5 Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the

equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

- 6.EE.B.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
- 6.EE.B.7 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 nonnegative rational numbers.
- 6.EE.B.8 Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

Unit 5	Area, Surface Area, and Volume Problems:	Grade Level	6	Approx Length	28 days
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CPSD Power Standards with Student Learning Objectives

6.G.A.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes • Apply these techniques in the context of solving real-world and mathematical problems. Note: Trapezoids will be defined to be a quadrilateral with at least one pair of opposite sides parallel, therefore all parallelograms are trapezoids.

Student-Friendly Objectives:

- I can find the base and height of a triangle and a special quadrilateral and use them to find the area..
- I can compose or decompose polygons into triangles and other shapes to find the area.
- I can solve real world problems that apply the area of polygons.

Learning Indicators of Power Standards

Students will know...

- Formulas for area of a triangle and special quadrilaterals
- Height is always perpendicular to the base.
- Area is a covering of an interior region using square units
- Area of any polygon by composing and decomposing into triangles and other shapes

And be able to...

- identify the base and height to find the area of the triangle.
- Use the base and height to find the area of a special quadrilateral.
- Find the area of polygons by composing or decomposing into triangles and other shapes.
- Solve real world problems by using the area of polygons.

Additional Arkansas State Standards

- 6.G.A.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V=bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
- 6.G.A.3 Draw polygons in the coordinate plane given coordinates for vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
- 6.G.A.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Unit 6	Statistics	Grade Level	6	Approx Length	16 days
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CPSD Power Standards with Student Learning Objectives

6.SP.A.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number (mean, median, mode)

Student-Friendly Objectives:

- I can calculate the measures of center for a given data set and use them to describe the data set.
- I can determine which measure of center best describes a data set.

Learning Indicators of Power Standards

<p>Students will know...</p> <ul style="list-style-type: none"> ● Measures of center include mean, median and mode of a set of data ● Every data point has an impact on the mean ● The median is not affected by extremely large or extremely small data points 	<p>And be able to...</p> <ul style="list-style-type: none"> ● Calculate the mean or average. ● Determine the median or middle number when the set of data is listed numerically. ● Find the mode or the number that occurs the most. ● Determine the best descriptor of a set of data.
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Additional Arkansas State Standards

- 6.SP.A.1 Recognize a statistical question as one that anticipate variability in the data related to the question and accounts for it in the answers. *For example, “How old am I?” is not a statistical question, but “How old are the students in my school?” is a statistical question because one anticipates variability in students’ ages.*
- 6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
- 6.SP.B.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
- 6.SP.B.5 Summarize numerical data sets in relation to their context, such as by:
 - Reporting the number of observations.
 - Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
 - Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were

gathered.

- Relating the choice of measures of center and variability to the shape of the data distribution and the context in which data were gathered.