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Other resources:

For SmartBoards: [www.sheppardsoftware.com/math](http://www.sheppardsoftware.com/math)

[www.activemaths.com](http://www.activemaths.com) (subscription)

[www.coolmath.com](http://www.coolmath.com)

[www.quia.com](http://www.quia.com)

[www.brainpop.com](http://www.brainpop.com) (subscription)

[www.learnalberta.ca](http://www.learnalberta.ca)

<http://www.dpi.state.nc.us/curriculum/mathematics/middlegrades/>

[www.khanacademy.com](http://www.khanacademy.com)

<http://www.nsa.gov/academia/early_opportunities/math_edu_partnership/collected_learning/middle_school/pre-algebra.shtml>

[www.learner.org/interactives](http://www.learner.org/interactives)

[www.mathisfun.com](http://www.mathisfun.com)

[www.mathplayground.com](http://www.mathplayground.com)

<http://regentsprep.org/>

[www.shodor.org](http://www.shodor.org)

<http://www.studyzone.org/mtestprep/>

[www.nlvm.usu.edu](http://www.nlvm.usu.edu)

[www.visualfractions.com](http://www.visualfractions.com)

<http://www.math-play.com/>

[www.mathforum.org](http://www.mathforum.org)

[www.wolframalpha.com](http://www.wolframalpha.com)

Math 6

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| **The Number System** | | | | | | | | |
| **Cluster** | **CCSS Number** | | **Common Core State Standard** | | | **Mathematical Practices** | **Learning Targets/ “I can…”** | |
| Compute fluently with multi-digit numbers and find common factors and multiples | 6.NS.4 | | 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).* Expectations for unit rates in this grade are limited to non-complex fractions | | | Look for and make use of structures | I can find the greatest common factor of 2 or more whole numbers less than or equal to 100.  I can find the least common multiple for two whole numbers less than or equal to 12.  I can use the distributive property to express a sum of two whole numbers 1–100 and with a common factor as a multiple of a sum of two whole numbers with no common factor. | |
| 6.NS.2 | | **Compute fluently with multi-digit numbers and find common factors and multiples.**  2. Fluently divide multi-digit numbers using the standard algorithm. | | | Attend to precision | I can divide a decimal by a whole number  I can divide a decimal by a decimal  I can find the greatest common factor of 2 or more whole numbers less than or equal to 100.  I can find the least common multiple for two whole numbers less than or equal to 12. | |
| 6.NS.3 | | 3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. | | | Attend to precision | I can represent decimal numbers to the 1000ths  I can compare and order decimals numbers  I can round decimals to the nearest whole number and the 1000ths place.  I can add and subtract decimals using models  I can multiply a decimal by a whole number  I can multiply a decimal by a decimal | |
| Apply and extend previous understandings of multiplication and division to divide fractions by fractions. | 6.NS.1 | | **Apply and extend previous understandings of multiplication and division to divide fractions by fractions.**  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 (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup*  *servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?* | | | Make sense of problems and persevere in solving them  Reason abstractly and quantitatively  Model with mathematics  Look for and make use of structure | * I can multiply a fraction by a fraction. * I can multiply a whole number by a fraction. * I can multiply mixed numbers. * I can solve problems by multiplying fractions * I can model the multiplication of fractions as a problem solving strategy * I can divide a fraction by a fraction. * I can divide a whole number by a fraction. * I can divide mixed numbers. * I can solve problems by dividing fractions   I can model the division of fractions as a problem solving strategy  I can write and evaluate fractional equations as a problem solving strategy. | |
| Apply and extend previous understandings of numbers to the system of rational numbers. | The Number System 6.NS.5 | | **Apply and extend previous understandings of numbers to the system of rational numbers.**  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. | | | Make sense of problems and persevere in solving them  Reason abstractly and quantitatively  Model with mathematics   * Look for and make use of structure | * I can understand that positive and negative numbers are used together to describe quantities. * I can understand that positive and negative numbers have opposite directions or values. * I can use positive and negative numbers to represent quantities in real-world contexts * I can explain the meaning of 0 zero pair. | |
| 6.NS.6 | | 6. 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.  a. 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, e.g.,  –(–3) = 3, and that 0 is its own opposite.  b. 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.  c. 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. | | | Make sense of problems and persevere in solving them  Model with mathematics  Use appropriate tools strategically  Attend to precision  Look for and make use of structures | a.I can recognize opposite signs of numbers as indicating locations  on opposite sides of 0 on the number line  I can recognize that the opposite of the opposite of a number is the number itself, e.g.,–(–3) = 3, and that 0 is its own opposite.  b. I can understand that signs of numbers in ordered pairs indicate locations in quadrants of the coordinate plane;  I can recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.  c. I can find and position integers and other rational numbers on a  horizontal or vertical number line diagram  I can find and position pairs of integers and other rational numbers on a coordinate plane. | |
| 6.NS.7 | | 7. Understand ordering and absolute value of rational numbers.  a. Interpret statements of inequality as statements about the relative  position of two numbers on a number line diagram. *For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.*  b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write –3 oC > –7 oC to*  *express the fact that –3 oC is warmer than –7 oC.*  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. *For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.*  d. 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.* | | |  | a.I can interpret statements of inequality as statements about the relative  position of two numbers on a number line diagram.  b. I can write, interpret, and explain statements of order for rational  numbers in real-world contexts  c. I can understand the absolute value of a rational number as its distance  from 0 on the number line.  I can interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.  d.I can distinguish comparisons of absolute value from statements about  order | |
| 6.NS.8 | | 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.. | | |  | I can solve real-world and mathematical problems by graphing points in all  four quadrants of the coordinate plane.  I can use coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.. | |
| **Ratio and Proportional Relationships**  1 Expectations for unit rates in this grade are limited to non-complex fractions. | | | | | | | | |
| **Cluster** | | **CCSS Number** | | **Common Core State Standard** | **Mathematical Practices** | | | **Learning Targets/ “I can…”** |
| Understand ratio concepts and use ratio reasoning to solve problems. | | 6.RP.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.”* | Make sense of problems and persevere in solving them  Model with Mathematics  Attend to precision | | | I can write a ratio to describe a relationship between two quantities |
| 6.RP.2. | | Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 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 3/4 cup of flour for each cup of sugar.” “We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger”* | Make sense of problems and persevere in solving them  Reason abstractly and quantitatively  Model with Mathematics  Attend to precision | | | I can identify and calculate a unit rate  I can analyze the relationship between a ratio and a unit rate |
| 6.RP.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.   A. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.   * + B. Solve unit rate problems including those involving unit pricing and constant speed. *For 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?*   + C. 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.   + D. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. | Make sense of problems and persevere in solving them  Reason abstractly and quantitatively  Model with Mathematics  Attend to precision  Look for an express regularity in repeated reasoning | | | I can create tables of equivalent rations using whole number measurements.  I can determine missing values in tables.  I can plot pairs of values from a table on a coordinate plane.  I can solve multi-step unit rate problems (including unit pricing and constant speed)  I can find the percent of a number as a rate per 100  I can find the whole, given a part of the quantity and the percent.  I can convert measurement units using ratio reasoning. (dimensional analysis) |

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| **Expressions and Equations** | | | | |
| **Cluster** | **CCSS Number** | **Common Core State Standard** | **Mathematical Practices** | **Learning Targets/ “I can…”** |
| Apply and extend previous understandings of arithmetic to algebraic expressions | 6.EE.1 | Write and evaluate numerical expressions involving whole-number exponents. | Make sense of problems and persevere in solving them | I can evaluate exponential expressions  I can write numerical expressions involving whole-number exponents in expanded form  I can write numeric expressions using whole number exponents  I can evaluate numeric expressions using the order of operations |
| 6.EE.2 | 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” 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 V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = 1/2.* | Reason abstractly and quantitatively  Attend to precision  Look for an make use of structures | I can identify parts of an expression using mathematical terms  I can view one or more parts of an expression as a single entity  I can translate a problem from words to the language of Algebra  I can substitute numeric values for variables and evaluate the expression using the order of operations |
| 6.EE.3. | * Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.* | Make sense of problems and persevere in solving them  Reason abstractly and quantitatively  Attend to precision  Look for an make use of structures | I can use the commutative property to generate equivalent expressions  I can use the associative property to generate equivalent expressions  I can use the distributive property to generate equivalent expressions  I can generate equivalent expressions by combining like terms |
| 6.EE.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. Reason about and solve one-variable equations and inequalities.* | Make sense of problems and persevere in solving them  Reason abstractly and quantitatively  Attend to precision  Look for an make use of structures | I can identify when two expressions are equivalent  I can use substitution to verify when two expressions are equivalent |
| Reason about and solve one-variable equations and inequalities. | 6.EE.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. |  | I can use substitution to identify the solution for an equation from a specified set  I can use substitution to identify the solutions for an inequality from a specified set  I can prove that a solution is a value that makes and equation or inequality true. |
| 6.EE.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. |  | I can use a variable to represent an unknown number  I can use variables to represent numbers and write expressions when solving real-world mathematical number |
| 6.EE.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. | Make sense of problems and persevere in solving them  Model with mathematics | I can write and solve one step equations  I can define and use inverse operations |
| 6.EE.8 | * Write an inequality of the form *x* > *c* or *x* < *c* to represent a constraint or condition in a real-world or 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. |  | I can write an inequality to represent a real world or mathematical problem  I can recognize that an inequality has infinitely many solutions  I can represent the solutions of inequalities on number line diagrams |
| Represent and analyze quantitative relationships between dependent and independent variables. | 6.EE.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. |  | I can use variables to represent two related quantities in a real world problem  I can define independent and dependent variables  I understand the relationship between independent and dependent values  I can write an equation to express the relationship between independent and dependent variables  I can construct a table showing the relationship between independent and dependent variables  I can analyze the relationship between independent and dependent variables using tables  I can relate an equation to a table of values  I can translate graphical and numerical data in tables to an equation  I can construct a graph showing the relationship between independent and dependent variables  I can analyze the relationship between independent and dependent variables using graphs  I can relate an equation to a graph |

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| **Geometry** | | | | |
| **Cluster** | **CCSS Number** | **Common Core State Standard** | **Mathematical Practices** | **Learning Targets/ “I can…”** |
| Solve real-world and mathematical problems involving area, surface area, and volume. | 6.G.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 | Model with Mathematics | I can find the area of polygons  I can compose and decompose polygons into triangles and rectangles  I can find the area of a shape by decomposing it into other shapes |
| 6.G.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 = l w h* and *V = b h* to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. | Reason abstractly and quantitatively | I can find the volume of a right rectangular prism. (using unit cubes)  I can apply the formulas used to calculate volume. |
| 6.G.3 | . Draw polygons in the coordinate plane given coordinates for the 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 | Make sense of problems and persevere in solving them  Look for an make use of structures | I can draw a polygon in the coordinate plane with given ordered pair vertices  I can graph ordered pairs in a coordinate plane  I can find the distance between two points in the coordinate plane (with the same first or second coordinate) |
| 6.G.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 | Make sense of problems and persevere in solving them  Reason abstractly and quantitatively  Model with Mathematics  Use appropriate tools strategically  Attend to precision | I can model a 3 Dimensional figure using a net  I can use a net to calculate the surface area of a 3 dimensional figure |

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| **Statistics and Probability** | | | | |
| **Cluster** | **CCSS Number** | **Common Core State Standard** | **Mathematical Practices** | **Learning Targets/ “I can…”** |
| Develop understanding of statistical variability. | 6.SP.1 | Recognize a statistical question as one that anticipates 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.* | Make sense of problems and persevere in solving them  Construct viable arguments and critique the reasoning of others | I can identify a statistical question  I can recognize and create a statistical question.  I can recognize that data can have variability |
| 6.SP.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. | Model with Mathematics  Attend to precision  Look for and make use of structures | I can determine the distribution for a set of data  I can describe a set of data by its center, spread, and overall shape  I can describe a set of data by identifying data clusters, peaks, gaps, and symmetry including spread and overall shape |
| 6.SP.3 | Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. | Make sense of problems and persevere in solving them  Model with Mathematics  Attend to precision | I can calculate the measures of central tendency for a set of data (mean, median, mode)  I can recognize outliers in a set of data  I can explain that a measure of center is a summary for a set of data  I can explain that a measure of variation describes the variation in a set of data  I can find the range/ interquartile range of a numerical set of data  I can determine the mean absolute deviation of a numerical set of data  I can calculate the measure of variation for a set of data |