Common Core Skill Alignment

6TH GRADE MATH

6.RP Ratios and Proportional Relationships

6.RP.A Understand ratio concepts and use ratio reasoning to solve problems.

6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

- [ ] **R.2** Write a ratio: word problems

6.RP.A.2 Understand the concept of a unit rate a/b associated with a ratio a:b with b is not equal to 0, and use rate language in the context of a ratio relationship.

- [ ] **R.7** Unit rates and equivalent rates

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.

6.RP.A.3a 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.

- [ ] **R.3** Identify equivalent ratios
- [ ] **R.4** Write an equivalent ratio
- [ ] **R.5** Ratio tables
- [ ] **R.6** Equivalent ratios: word problems

6.RP.A.3b Solve unit rate problems including those involving unit pricing and constant speed.

- [ ] **R.9** Unit rates: word problems
- [ ] **V.2** Unit prices
- [ ] **V.3** Unit prices with fractions and decimals

6.RP.A.3c 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.

- **S.1** What percentage is illustrated?
- **S.5** Percents of numbers and money amounts
- **S.6** Percents of numbers: word problems
- **S.10** Find the total given a part and a percent
- **V.1** Which is the better coupon?
- **V.5** Sale prices

6.RP.A.3d Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

- **T.3** Convert and compare customary units
- **T.4** Convert, compare, add, and subtract mixed customary units
- **T.5** Multiply and divide mixed customary units
- **T.6** Customary unit conversions involving fractions and mixed numbers
- **T.7** Convert and compare metric units
- **T.8** Convert between customary and metric systems
- **V.4** Unit prices with customary unit conversions

6.NS The Number System

6.NS.A Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

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.

- **L.2** Reciprocals
- **L.4** Divide fractions by whole numbers in recipes
- **L.5** Divide fractions

- [ ] **L.7** Divide fractions and mixed numbers
- [ ] **L.8** Divide fractions and mixed numbers: word problems

6.NS.B Compute fluently with multi-digit numbers and find common factors and multiples.

6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm.

- [ ] **C.1** Divisibility rules
- [ ] **C.2** Division patterns with zeroes
- [ ] **C.3** Divide numbers ending in zeroes: word problems
- [ ] **C.5** Divide whole numbers - 2-digit divisors
- [ ] **C.6** Divide whole numbers - 3-digit divisors

6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

- [ ] **G.1** Add and subtract decimal numbers
- [ ] **G.2** Add and subtract decimals: word problems
- [ ] **G.4** Maps with decimal distances
- [ ] **H.2** Multiply decimals
- [ ] **H.4** Divide decimals by whole numbers
- [ ] **H.5** Divide decimals by whole numbers: word problems
- [ ] **H.6** Multiply and divide decimals by powers of ten
- [ ] **H.7** Division with decimal quotients
- [ ] **O.4** Add, subtract, multiply, or divide two decimals
- [ ] **O.5** Add, subtract, multiply, or divide two decimals: word problems

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.

- [ ] **E.4** Identify factors

- [ ] **E.7** Greatest common factor
- [ ] **E.8** Least common multiple
- [ ] **E.9** GCF and LCM: word problems

6.NS.C Apply and extend previous understandings of numbers to the system of rational numbers.

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.

- [ ] **M.1** Understanding integers

6.NS.C.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.

6.NS.C.6a 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.

- [ ] **P.6** Rational numbers: find the sign

6.NS.C.6b 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.

- [ ] **X.3** Quadrants

6.NS.C.6c 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.

- [ ] **F.8** Decimal number lines
- [ ] **M.2** Integers on number lines
- [ ] **M.4** Graph integers on horizontal and vertical number lines
- [ ] **X.1** Objects on a coordinate plane
- [ ] **X.2** Graph points on a coordinate plane

6.NS.C.7 Understand ordering and absolute value of rational numbers.

6.NS.C.7a Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.

- [ ] **M.5** Compare integers

6.NS.C.7b Write, interpret, and explain statements of order for rational numbers in real-world contexts.

- [ ] **P.1** Compare rational numbers
- [ ] **P.2** Put rational numbers in order
- [ ] **T.9** Compare temperatures above and below zero

6.NS.C.7c 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.

- [ ] **M.3** Absolute value and opposite integers
- [ ] **P.3** Absolute value of rational numbers

6.NS.C.7d Distinguish comparisons of absolute value from statements about order.

- [ ] **P.2** Put rational numbers in order
- [ ] **P.3** Absolute value of rational numbers

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.

- [ ] **X.4** Coordinate planes as maps
- [ ] **X.5** Distance between two points
- [ ] **X.6** Follow directions on a coordinate plane

6.EE Expressions and Equations

6.EE.A Apply and extend previous understandings of arithmetic to algebraic expressions.

6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents.

- [ ] **D.1** Write multiplication expressions using exponents
- [ ] **D.2** Evaluate exponents
- [ ] **D.3** Find the missing exponent or base
- [ ] **D.4** Exponents with decimal bases
- [ ] **D.5** Exponents with fractional bases

6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers.

6.EE.A.2a Write expressions that record operations with numbers and with letters standing for numbers.

- [ ] **Y.1** Write variable expressions

6.EE.A.2b 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.

- [ ] **Y.6** Identify terms and coefficients
- [ ] **Y.7** Sort factors of expressions

6.EE.A.2c 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).

- [ ] **O.3** Evaluate numerical expressions involving whole numbers
- [ ] **O.6** Evaluate numerical expressions involving decimals
- [ ] **O.9** Evaluate numerical expressions involving fractions
- [ ] **Y.3** Evaluate variable expressions with whole numbers
- [ ] **Y.4** Evaluate multi-variable expressions
- [ ] **Y.5** Evaluate variable expressions with decimals, fractions, and mixed numbers

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

- [ ] **Y.10** Multiply using the distributive property
- [ ] **Y.11** Factor using the distributive property
- [ ] **Y.13** Write equivalent expressions using properties

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).

- [ ] **Y.15** Identify equivalent expressions

6.EE.B Reason about and solve one-variable equations and inequalities.

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.

- [ ] **Z.1** Does x satisfy an equation?
- [ ] **Z.2** Which x satisfies an equation?
- [ ] **AA.1** Solutions to inequalities

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.

- [ ] **Y.2** Write variable expressions: word problems

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.

- [ ] **Z.4** Model and solve equations using algebra tiles
- [ ] **Z.5** Write and solve equations that represent diagrams
- [ ] **Z.6** Solve one-step equations with whole numbers
- [ ] **Z.7** Solve one-step equations with decimals, fractions, and mixed numbers
- [ ] **Z.8** Solve one-step equations: word problems

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 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.

- **AA.2** Graph inequalities on number lines
- **AA.3** Write inequalities from number lines

6.EE.C Represent and analyze quantitative relationships between dependent and independent variables.

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.

- **BB.2** Identify independent and dependent variables
- **BB.3** Find a value using two-variable equations
- **BB.4** Solve word problems involving two-variable equations
- **BB.5** Complete a table for a two-variable relationship
- **BB.6** Write a two-variable equation
- **BB.7** Identify the graph of an equation
- **BB.8** Graph a two-variable equation
- **BB.9** Interpret a graph: word problems
- **BB.10** Write an equation from a graph using a table

6.G Geometry

6.G.A Solve real-world and mathematical problems involving area, surface area, and volume.

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.

- **FF.3** Area of triangles

- [ ] **FF.4** Area of parallelograms and trapezoids
- [ ] **FF.5** Area of quadrilaterals
- [ ] **FF.6** Area of compound figures

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 = 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.

- [ ] **FF.14** Volume of cubes and rectangular prisms

6.G.A.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.

- [ ] **CC.7** Graph triangles and quadrilaterals

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.

- [ ] **FF.15** Surface area of cubes and rectangular prisms

6.SP Statistics and Probability

6.SP.A Develop understanding of statistical variability.

6.SP.A.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.

- [ ] **HH.5** Identify representative, random, and biased samples

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.

- [ ] **GG.4** Create line plots
- [ ] **GG.18** Stem-and-leaf plots
- [ ] **GG.19** Interpret box-and-whisker plots

6.SP.A.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.

- [ ] **HH.3** Mean, median, mode, and range: find the missing number

6.SP.B Summarize and describe distributions.

6.SP.B.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

- [ ] **GG.4** Create line plots
- [ ] **GG.19** Interpret box-and-whisker plots

6.SP.B.5 Summarize numerical data sets in relation to their context, such as by:

6.SP.B.5a Reporting the number of observations.

- [ ] **GG.3** Interpret line plots
- [ ] **GG.11** Interpret histograms

6.SP.B.5b Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

- [ ] **HH.5** Identify representative, random, and biased samples

6.SP.B.5c 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.

- [ ] **HH.1** Calculate mean, median, mode, and range
- [ ] **HH.2** Interpret charts and graphs to find mean, median, mode, and range
- [ ] **HH.4** Calculate mean absolute deviation

6.SP.B.5d Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.