

# Huntsville City Schools

## Sixth Grade Honors Math Pacing Guide

### 2018 - 2019

- Thoughtful and effective **planning** throughout the school year is crucial for student mastery of standards.
- Once a standard is introduced, it is understood that the standard is continuously taught and/or reviewed throughout the **entire** school year.
- Some standards appear in multiple grading periods. The bulleted section typed below the standard is the portion of the standard that students should master in that time frame.

## First Nine Weeks

### The Number System – 6<sup>th</sup> and 7<sup>th</sup> Grade

**6.NS.1:** Interpret and compute quotients of fractions, solve word problems involving division of fractions.

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

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

**6.NS.5:** Understand that positive and negative numbers are used together to describe quantities having opposite direction or values. (e. g. temperature above/below zero; elevation above/below sea level; credits/debits; positive/negative electrical charge); use positive and negative numbers to represent quantities in real-world contexts explaining the meaning of 0 in each situation.

**6.NS.6:** Understand a rational number as a point on a 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.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.

**6.NS.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.

**6.NS.6C:** Find and position integers and other rational numbers on a horizontal or vertical number line diagrams; find and position pairs of integers and other rational numbers on a coordinate plane.

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

**6.NS.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.

**7.NS.1:** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

**7.NS.1A:** Describe situations in which opposite quantities combine to make 0.

**7.NS.1B:** Understand  $p + q$  as the number located a distance  $|q|$  from  $p$ , in the positive or negative direction depending on whether  $q$  is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.

**7.NS.1C:** Understand subtraction of rational numbers as adding the additive inverse,  $p - q = p + (-q)$ . Show that the distance between two rational numbers on the number line is the absolute value of the difference, and apply this principle in real-world contexts.

**7.NS.1D:** Apply properties of operations as strategies to add and subtract rational numbers.

**7.NS.2:** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

**7.NS.2A:** Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as  $(-1)(-1) = 1$  and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

**7.NS.2B:** Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with nonzero divisor) is a rational number. If  $p$  and  $q$  are integers, then  $-(p/q) = (-p)/q = p/(-q)$ . Interpret quotients of rational numbers by describing real-world contexts.

**7.NS.2C:** Apply properties of operations as strategies to multiply and divide rational numbers.

**7.NS.2D:** Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0's or eventually repeats.

**7.NS.3:** Solve real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions).

## Second Nine Weeks

### Expressions and Equations – 6<sup>th</sup> Grade

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

**6.EE.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)

**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.

**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.

### Expressions and Equations – 7<sup>th</sup> Grade

**7.EE.1:** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

**7.EE.2:** Understand that rewriting an expression in different forms in a problem context can shed light on the problem, and how the quantities in it are related . Understand that rewriting an expression in different forms in a problem context can shed light on the problem, and how the quantities in it are related.

**7.EE.3:** Solve multistep real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form, convert between forms as appropriate, and assess the reasonableness of answers using mental computation and estimation strategies.

**7.EE.4:** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

**7.EE.4A:** Solve word problems leading to equations of the form  $px + q = r$  and  $p(x + q) = r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.

**7.EE.4B:** Solve word problems leading to inequalities of the form  $px + q > r$  or  $px + q < r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Graph the solution set of the inequality, and interpret it in the context of the problem.

## Third Nine Weeks

### Ratios and Proportions – 7<sup>th</sup> Grade

**7.RP.1:** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units

**7.RP.2:** Recognize and represent proportional relationships between quantities.

**7.RP.2A:** Decide whether two quantities are in a proportional relationship, e.g. by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

**7.RP.2B:** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

**7.RP.2C:** Represent proportional relationships by equations.

(Reinforce equations standards)

**7.RP.2D:** 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.

## Fourth Nine Weeks

### Ratios and Proportions – 7<sup>th</sup> Grade

**7.RP.3:** Use proportional relationship to solve multistep ratio and percent problems.

### Geometry – 6<sup>th</sup> and 7<sup>th</sup> Grade

**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.

**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  $V = lwh$  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.4:** Represent three-dimensional figures using nets made up of rectangular 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

**7.G.1:** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

**7.G.2:** Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

**7.G.4:** Know the formulas for the area and circumference of a circle, and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

**7.G.5:** Use facts about supplementary, complementary, vertical, and adjacent angles in a multistep problem to write and solve simple equations for an unknown angle in a figure.

### Statistics and Probability – 6<sup>th</sup> Grade

**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.

**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.

**6.SP.3:** Recognize that a measure of center for 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.

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

**6.SP.5:** Summarize numerical data sets in relation to their context.

**6.SP.5A:** Summarize numerical data sets in relation to their context such as by: Reporting the number of observations.

**6.SP.5B:** Summarize numerical data sets in relation to their context such as by: Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

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

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

### Statistics and Probability – 7<sup>th</sup> Grade

**7.SP.5:** Understand that the probability of a chance event is a number between 0 and 1 expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around  $\frac{1}{2}$  indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

**7.SP.6:** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.

**7.SP.7:** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

**7.SP.7A:** Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.

**7.SP.7B:** Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.

# 6<sup>th</sup> Grade Academic Language

**Academic Language** is the specialized vocabulary associated with instruction and mastery of academic content and tasks. The words listed below reflect the *minimum* vocabulary necessary for students to become proficient with grade-level standards.

## First Nine Weeks

### The Number System

numerator, denominator, fraction, factor, product, cross cancel, reciprocal, quotient, simplest form, divisor, dividend, tenths, hundredths, thousandths, ten-thousandths, positive numbers, negative numbers, line diagrams, Absolute value, rational numbers, integers, rational numbers, whole numbers, additive inverses reciprocals, complex fractions, repeating decimals terminating decimals, accuracy

## Second Nine Weeks

### Expressions and Equations

order of operations, variable, equation, expression, numerical expression, equation operations, algebraic expression, evaluate, exponent, term, coefficient, product, factor, formula, greatest common factor(GCF), multiple, least common multiple(LCM), distributive property, substitution, equivalent, inequality, quadrant, coordinate plane, like terms, constants, simplify, expand, equation, isolate, two-step equation, solution set, conjecture, equivalent inequalities

## Third Nine Weeks

### Ratios and Proportions

ratio, rate unit rate, percent, percent error, proportions, equivalent fractions, equivalent ratios, terms of a ratio, unit price, least common multiple(LCM), constant of proportionality, dependent variable, independent variable, percent equation, commission, interest, simple interest, principal, interest rate, balance, interest period, markup, markdown, percent of increase, percent of decrease, dimensional analysis

## Fourth Nine Weeks

### Geometry

scale drawing, scale, area, polygon, plane figure, square, rectangle, parallelogram, trapezoid, pentagon, octagon, formula, 3-dimensional figure, net, prism, pyramid, surface area, volume, rectangular prism, triangular prism, triangular pyramid, cube, pentagonal prism, hexagonal prism, octagonal prism  
Angle, vertex, straight angle, obtuse angle, acute angle, right angle, adjacent angles, complementary angles, supplementary angles, vertical angles, circle, center of a circle, radius, diameter, circumference, area

### Statistics and Probability

probability of an event, outcome, sample space, event, action, trial, relative frequency, experimental probability, theoretical probability, simulation, probability model, uniform probability model  
Statistical question, data, frequency, dot plot, intervals, histogram, box and whisker plot, median, mean, mean absolute deviation (MAD), range, interquartile range, deviation, measure of center, measure of variation