6th Grade Advanced Academic Scope & Sequence

Days May Vary	Unit	Standard(s)/Outcome(s)	Essential/Guiding Questions
19-22	Unit 1: The Number System - Integers	• 6.NS.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, debits/credits, 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.6 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.7 Understand ordering and absolute value of rational numbers. • 7.NS.1: Apply and extend	• How are absolute values and opposites related to integers, the number line, and the coordinate plane? • How does the concept of absolute value relate to addition and subtraction of integers? • How are addition and subtraction related to each other as applied to positive and negative numbers? (Subtracting is the same as adding the opposite) • How are multiplying and dividing related to each other as applied to integers? • How do mathematical properties offer a variety of methods to solve problems?

		previous understandings of addition and subtraction to add and subtract rational numbers, and represent addition and subtraction on a horizontal or vertical number line diagram. ● 7.NS.2: Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	
16-18	Unit 2: The Number System - Decimals	● 6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. ● 7.NS.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers, and represent addition and subtraction on a horizontal or vertical number line diagram. ● 7.NS.2: Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational number. ● 7NS.3: Solve real-world and	● How are decimals applied in the real world? ● How do you model multiplication and division of decimals? ● How would you describe the process of multiplying and dividing decimals without using models? ● How is dividing decimals different than dividing by whole numbers? ● How do integer operations compare to signed decimal operations?

25-27	Unit 3: The Number System - Fractions	mathematical problems involving the four operations with rational numbers. (Note: Computations with rational numbers extend the rules for manipulating fractions to complex fractions.) ● 6.NS.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. *How much chocolate will each person get if 3 people share 12 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 3/4mi and area 1/2 square mi?* ● 6.NS.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	● How are fractions applied in the real world? ● How do you differentiate between factors and multiples? ● How do you use models to accurately add, subtract, multiply, and divide fractions? ● Why is more efficient to use the least common denominator as the common denominator? ● When multiplying and dividing proper fractions, what can you predict about the product? ● Why does it work to invert and multiply when dividing fractions? ● How are fraction operations related to fraction operations of signed fractions? ● How are integer operations related to fraction

		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). ● 7.NS.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers, and represent addition and subtraction on a horizontal or vertical number line diagram. ● 7.NS.2: Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational number. ● 7NS.3: Solve real-world and mathematical problems involving the four operations with rational numbers. (Note: Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)	operations with signed fractions? ● How is subtracting signed fractions the same as adding the opposite?
18-20	Unit 4: Ratios and Proportional Relationships	● 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	● How are ratios and rates similar? How are they different? ● What is the relationship between ratio reasoning and converting measurement units? ● Where are three situations

		was 1 beak." "For every vote candidate A received, candidate C received nearly three votes." ● 6.RP.2Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0 (b not equal to zero), 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." (Expectations for unit rates in this grade are limited to non-complex fractions.) ● 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. ● 7.RP.2a. Recognize and represent proportional relationships between quantities. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a	in the real-world where unit rates are applied? ● What is the difference between rate and unit rate? ● What is the constant of proportionality in a table, graph, or equation? ● How is a proportional relationship represented on a coordinate plane?

		coordinate plane and observing whether the graph is a straight line through the origin. ●	
15-17	Unit 5: Expressions	● 6.EE.1 Write and evaluate numerical expressions involving whole-number exponents. ● 6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers ● 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. ● 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.	● How do exponents relate to repeated multiplication and the order of operations? ● What is the appropriate mathematical language needed to convert algebraic expressions to verbal expressions and vice versa? ● What are the various ways to represent all operations in expressions? ● How can one apply the properties of operations to produce equivalent expressions? How can one use a variable in a real world problem?

		• 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. • 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. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*	

17-19	Unit 6: Equations	• 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. • 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.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	• What is the appropriate mathematical language needed to convert algebraic equations to verbal equations and vice versa? • What are the various ways to represent multiplication and division in equations? • How does substitution determine whether a given number in a specified set makes an equation true? How can one use a variable in a real world problem?

		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. ● 7.EE.3: Solve multi-step 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. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*	
9-11	Unit 7: 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. • 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. • 7.EE.4b. Solve word problems leading to inequalities of the	• What is the appropriate mathematical language needed to convert inequalities to verbal expressions and vice versa? • How does substitution determine whether a given number in a specified set makes an inequality true? • What is an inequality, and how can they be used in real world and mathematical problems? • How are solving equations and inequalities similar or different?

		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. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*	
15-17	Unit 8: Geometry	• 6.G.1 Find 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.2-1 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. • 6.G.2-2 Apply the formulas and to	• How will I apply my prior knowledge of area formulas when determining the area of a composite shape? • What steps are required when finding the surface area of a variety of shapes using nets?

		find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. *V = lwh and V = Bh* ● 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. ● 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.	
16-18	Unit 9: Probability and Statistics	● 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	● What are elements of effective statistical questions? ● How are different measures of center more valid than others depending on data set

		question, but “How old are the students in my school?” is a statistical question because one anticipates variability in students’ ages. ● 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 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 ● 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 conte	composition? ● What elements of statistical data can be used to describe its distribution? ● What effect do outliers have on measures of center and measures of variability