

# Grade Six

## Tecumseh School District Math Curriculum Map

## Quarter 1

Standard	Learning Targets	Intro	Continuation	Assess Benchmark	Vocabulary
Math.6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents.	<p>Write numerical expressions involving whole number exponents. Ex <math>3^4 = 3 \times 3 \times 3 \times 3</math></p> <p>Evaluate numerical expressions involving whole number exponents. Ex <math>3^4 = 3 \times 3 \times 3 \times 3 - 81</math></p> <p>Solve order of operation problems that contain exponents. Ex. <math>3 + 2^2 - (2 + 3) = 2</math></p>				<p>exponents base expressions variables sum term product factor quotient coefficient like terms evaluate order of operations equivalent expressions properties of operations equivalent expressions properties of equality inverse input/output table</p>
Math.6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers	<p>Use numbers and variables to represent desired operations</p> <p>Translating written phrases into algebraic expressions</p> <p>Translating algebraic expressions into written phrases</p>				
Math.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.	<p>Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient).</p> <p>Identify parts of an expression as a single entity, even if not a monomial</p>				
Math.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)	<p>Substitute specific values for variables</p> <p>Evaluate algebraic expressions including those that arise from real-world problems.</p> <p>Apply order of operations when there are no parentheses for expressions that include whole number exponents</p>				
Math.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).	<p>Recognize when two expressions are equivalent.</p> <p>Prove (using various strategies) that two equations are equivalent no matter what number is substituted.</p>				

Standard	Learning Targets	Intro	Continuation	Assess Benchmark	Vocabulary
Math.6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation with speed and accuracy				
Math.6.EE.A.3 Apply the properties of operations to generate equivalent expressions	Generate equivalent expressions using the properties of operations (e.g., distributive property, associative property, adding like terms with the addition property of equality, etc)				
Math.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.	Recognize that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.  Relate variables to a context.  Write expressions when solving a real-world or mathematical problem.				
Math.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.	Define inverse operation.  Know how inverse operations can be used in solving one-variable equations.  Apply rules of the form $x+p=q$ and $px=q$ , for cases in which $p$ , $q$ , and $x$ are all nonnegative rational numbers, to solve real world and mathematical problems. (There is only one unknown quantity).  Develop a rule for solving one-step equations using inverse operations with nonnegative rational coefficients.  Solve and write equations for real-world mathematical problems containing one unknown.				

## Quarter 2

Standard	Learning Targets	Intro	Teach	Assess	Vocabulary
Math.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.	<p>Recognize solving an equation or inequality as a process of answering "which values from a specified set, if any, make the equation or inequality true?"</p> <p>Know that the solutions of an equation or inequality are the values that make the equation or inequality true.</p> <p>Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p>				<p>coordinate plane x and y axes quadrants ordered pair origin linear equation equation property of equality inverse inequality dependent variable independent variable integers opposites absolute value rational number</p>
Math.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.	<p>Identify the constraint or condition in a real-world or mathematical problem in order to set up an inequality.</p> <p>Recognize that inequalities of the form <math>x &gt; c</math> or <math>x &lt; c</math> have infinitely many solutions.</p> <p>Write an inequality of the form <math>x &gt; c</math> or <math>x &lt; c</math> to represent a constraint or condition in a real-world or mathematical problems.</p> <p>Represent solutions to inequalities of the form <math>x &gt; c</math> or <math>x &lt; c</math>, with infinitely many solutions, on number line diagrams.</p>				

Math.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.	<p>Define independent and dependent variables.</p> <p>Use variables to represent two quantities in a real-world problem that change in relationship to one another.</p> <p>Write an equation to express one quantity (dependent) in terms of the other quantity (independent).</p> <p>Analyze the relationship between the dependent variable and independent variable using tables and graphs.</p> <p>Relate the data in a graph and table to the corresponding equation.</p>				
Math.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.	<p>Identify an integer and its opposite.</p> <p>Use integers to represent quantities in real world situations (above/below sea level, etc)</p> <p>Explain where zero fits into a situation represented by integers.</p>				
Math.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.					

Math.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.	.Identify a rational number as a point on the number line. .Identify the location of zero on a number line in relation to positive and negative numbers. .Recognize opposite signs of numbers as locations on opposite sides of 0 on the number line. .Recognize the signs of both numbers in an ordered pair indicate which quadrant of the coordinate plane the ordered pair will be located. .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. .Reason that the opposite of the opposite of a number is the number itself. .Reason that when only the x value in a set or ordered pairs are opposites, it creates a reflection over the y axis, e.g., $(x,y)$ and $(-x,y)$ . .Recognize that when only the y value in a set of ordered pairs are opposites, it creates a reflection over the x axis, e.g., $(x,y)$ and $(x,-y)$ . .Reason that when two ordered pairs differ only by signs, the locations of the points are related by reflections across both axes, e.g., $(-x, -y)$ and $(x,y)$ .				
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Math.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.					
Math.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.					
Math.6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.					
Math.6.NS.C.7 Understand ordering and absolute value of rational numbers.					
Math.6.NS.C.7a Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.	Order rational numbers on a number line.  Identify absolute value of rational numbers.  Interpret statements of inequality as statements about relative position of two numbers on a number line diagram.  Write, interpret, and explain statements of order for rational numbers in real-world contexts.  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 and apply to real world contexts.				
Math.6.NS.C.7b Write, interpret, and explain statements of order for rational numbers in real-world contexts.					
Math.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.					

Math.6.NS.C.7.d Distinguish comparisons of absolute value from statements about order.					
Math.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.	<p>Calculate absolute value.</p> <p>Graph points in all four quadrants of the coordinate plane.</p> <p>Solve real-world problems by graphing points in all four quadrants of coordinate plane.</p> <p>Given only coordinates, calculate the distances between two points with the same first coordinate or the same second coordinate using absolute value.</p>				

## Quarter 3

Standard	Learning Targets	Intro	Continuation	Assess	Vocabulary
Math.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.	<p>Compute quotients of fractions divided by fractions (including mixed numbers).</p> <p>Interpret quotients of fractions.</p> <p>Solving word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.</p>				<p>ratio terms proportion rate unit rate unit price formula capacity meter gram liter kilo- centi- milli- percent</p>
Math.6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.	<p>Write ratio notation- ____:____, ____ to ____, ____/____</p> <p>Know order matters when writing a ratio.</p> <p>Know ratio can be simplified.</p> <p>Know ratios compare two quantities; the quantities do not have to be the same unit of measure.</p> <p>Recognize that ratios appear in a variety of different contexts; part-to-whole, part-to-part, and rates.</p> <p>Generalize that all ratios relate two quantities or measures within a given situation in a multiplicative relationship.</p> <p>Analyze your context to determine which kind of ratio is represented.</p>				
Math.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.					

Math.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.	<p>Identify and calculate a unit rate.</p> <p>Use appropriate math terminology as related to rate.</p> <p>Analyze the relationship between a ratio <math>a:b</math> and a unit rate <math>a/b</math> where <math>b \neq 0</math>.</p>				
Math.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.	<p>Make a table of equivalent ratios using whole numbers.</p> <p>Find the missing values in a table of equivalent ratios.</p> <p>Plot pairs of values that represent equivalent ratios on the coordinate plane.</p> <p>Know that a percent is a ratio of a number to 100.</p> <p>Find a % of a number as a rate per 100.</p> <p>Use tables to compare proportional quantities.</p> <p>Solve real-world and mathematical problems involving ratio and rate, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number-lines, or equations.</p> <p>Apply the concept of unit rate to solve real-world problems involving unit pricing.</p> <p>Apply the concept of unit rate to solve real-world problems involving constant speed.</p> <p>Solve real-world problems involving finding the whole, given a part and a percent.</p> <p>Apply ratio reasoning to convert measurement units in real-world and mathematical problems.</p> <p>Apply ratio reasoning to convert measurement units by multiplying or dividing in real-world and mathematical problems.</p>				
Math.6.RP.A.3b Solve unit rate problems including those involving unit pricing and constant speed.					

Math.6.RP.A.3c Find a percent of 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 perfect.					
Math.6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm.					
Math.6.RP.A.3d Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.					

## Quarter 4

Standard	Learning Targets	Intro	Continuation	Assess	Vocabulary
Math.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 number 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor	<p>Knowledge targets: identify the factors of two whole numbers less than or equal to 100 and determine the Greatest Common Factor.</p> <p>Identify the multiples of two whole numbers less than or equal to 12 and determine the Least Common Multiple</p> <p>Reasoning targets: Apply the distributive Property to rewrite addition problems by factoring out the Greatest Common Factor.</p>				<p>rectangle parallelogram rhombus polygon right triangle area trapezoid polyhedron faces edge vertex</p>
Math.6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm	<p>Knowledge targets: Fluently divide multi-digit numbers using the standard algorithm with speed and accuracy.</p>				<p>cylinder sphere cone prism</p>
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.	<p>Knowledge targets: Know that 3-D figures can be represented by nets</p> <p>Reasoning targets: Represent three-dimensional figures using nets made up of rectangles and triangles.</p> <p>Apply knowledge of calculating the area of rectangles and triangles to a net, and combine the areas for each shape into one answer representing the surface area of a 3-dimensional figure.</p> <p>Solve real-world and mathematical problems involving surface area using nets.</p>				<p>pyramid net surface area volume statistical question data distribution outlier mean (average) median mode range frequency table</p>

Standard	Learning Targets	Intro	Continuation	Assess	Vocabulary
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.	<p>Knowledge targets: Know how to calculate the volume of a right rectangular prism.</p> <p>Reasoning targets: Apply volume formulas for right rectangular prisms to solve real-world and mathematical problems involving rectangular prisms with fractional edge lengths.</p> <p>Performance skill targets: Model the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths.</p>				<p>histogram</p> <p>box plot</p> <p>quartiles</p> <p>interquartile range</p> <p>absolute deviation</p> <p>mean absolute deviation</p>
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.	<p>Knowledge targets: Draw polygons in the coordinate plane.</p> <p>Use coordinates (with the same x-coordinate or the same y-coordinate) to find the length of a side of a polygon.</p> <p>Reasoning targets: Apply the technique of using coordinates to find the length of a side of a polygon drawn in the coordinate plane to solve real-world and mathematical problems.</p>				
Math.6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation					
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. 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.	<p>Knowledge targets: Recognize that data can have variability.</p> <p>Recognize a statistical question (examples versus non-examples)</p>				

Standard	Learning Targets	Intro	Continuation	Assess	Vocabulary
6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be describe by its center, spread, and overall shape	<p>Knowledge targets: Know that a set of data has a distribution</p> <p>Describe a set of data by its center, e.g., mean and median</p> <p>Describe a set of data by its spread and overall shape, e.g. by identifying data clusters, peaks, gaps and symmetry</p>				
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	<p>Knowledge targets: Recognize there are measures of central tendency for a data set, e.g., mean, median, mode</p> <p>Recognize there are measures of variances for a data set, e.g., range, interquartile range, mean absolute deviation</p> <p>Recognize measures of central tendency for a data set summarizes the data with a single number</p> <p>Recognize measures of variation for a data set describes how its values vary with a single number</p>				
6.SP.B.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots	<p>Knowledge targets: Identify the components of dot plots, histograms, and box plots</p> <p>Find the median, quartile and interquartile range of a set of data</p> <p>Reasoning targets: Analyze a set of data to determine its variance</p> <p>Product targets: Create a dot plot to display a set of numerical data</p> <p>Create a histogram to display a set of numerical data</p> <p>Create a box plot to display a set of numerical data</p>				

Standard	Learning Targets	Intro	Continuation	Assess	Vocabulary
6.SP.B.5 Summarize numerical data sets in relation to their context, such as by: a. reporting the number of observations	<p>Knowledge targets:</p> <p>Organize and display data in tables and graphs</p> <p>Report the number of observations in a data set or display.</p> <p>Describe the data being collected, including how it was measured and its units of measurement</p> <p>Calculate quantitative measures of center, e.g., mean, median, mode</p> <p>Calculate quantitative measures of variance, e.g., range, interquartile range, mean absolute deviation</p> <p>Identify outliers</p> <p>Reasoning targets:</p> <p>Determine the effect of outliers on quantitative measures of a set of data, e.g., mean, median, mode, range, interquartile range, mean absolute deviation</p> <p>Choose the appropriate measure of central tendency to represent the data</p> <p>Analyze the shape of the data distribution and the context in which the data were gathered to choose the appropriate measures of central tendency and variability and justify why this measure is appropriate in terms of the context.</p>				
6.SP.B.5 Summarize numerical data sets in relation to their context, such as by: Describing the nature of the attribute under investigation					

Standard	Learning Targets	Intro	Continuation	Assess	Vocabulary
6.SP.B.5 Summarize numerical data sets in relation to their context, such as by: c. giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall					
6.SP.B.5 Summarize numerical data sets in relation to their context, such as by: d. relating the choice of measures of center and variability to the shape of the data					
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.	<p>Knowledge targets: Recognize and know how to compose and decompose polygons into triangles and rectangles</p> <p>Reasoning targets: Compare the area of a triangle to the area of the composed rectangle. (Decomposition addressed in previous grade).</p> <p>Apply the techniques of composing and/or decomposing to find the area of triangles, special quadrilaterals and polygons to solve mathematical and real world problems.</p> <p>Discuss, develop and justify formulas for triangles and parallelograms (6<sup>th</sup> grade introduction)</p>				