

**Jefferson Middle School
Course Syllabus**

A. Course - 6th Grade Mathematics

B. Department- Mathematics

C. Course Description - 6th Math is based on 6th grade TN state standards with an incorporation of half of the 7th grade TN state standards. Our focus is to learn ratio and ration language, using proportions to find an unknown, fraction & decimal operations, foundations of geometry and finding unknown angle measurements. We will also study algebra basics to solve equations using real-world situations. We will study graphs to analyze for misleading data or bias. We will introduce integers and the use in real world context.

D. Grade Term - 9 Weeks

E. Grading Scale

<u>Range</u>	<u>Regular</u>
93-100	A
85-92	B
75-84	C
70-74	D

F. Term Dates

- a. 1st 9 Weeks August 5, 2016 – October 7, 2016
- b. 2nd 9 Weeks October 8, 2016 – December 16, 2016
- c. 3rd 9 Weeks January 5, 2017 – March 15, 2017
- d. 4th 9 Weeks March 16, 2017 – May 25, 2017

G. Textbook(s) – Glencoe McGraw-Hill Tennessee Math Connects Course 1

H. Other Resources

- a. Odysseyware
- b. Carnegie Learning
- c. Supplemental Internet Resources

I. Procedures for Parental Access to Instructional Materials

- a. Aspen Parent Portal
- b. Teacher's Website (if applicable)
- c. Email Classroom Teacher
- d. Parent/Teacher Conference
- e. Remind (if applicable)

- a. There are two designated conference dates during the school year. If conference is needed, invitation will be sent. Parents who would like to request additional meetings may make appointments for conferences with the teachers (during their planning periods), counselors, or a principal by telephoning the school office.

J. Standards & Objectives from Tennessee State Department of Education

Domain	Cluster	Standard
Ratios and Proportional Relationships	Understand ratio concepts and use ratio reasoning to solve problems.	1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. <i>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."</i>
		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. <i>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.)</i>
		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. <ol style="list-style-type: none"> 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. Solve unit rate problems including those involving unit pricing and constant speed. <i>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?</i> 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. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
The Number System	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. <i>For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) 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?</i>
	Compute fluently with multi-digit numbers and find common factors and multiples.	2. Fluently divide multi-digit numbers using the standard algorithm.
		3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
		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. <i>For example, express $36 + 8$ as $4(9 + 2)$.</i>

The Number System

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

Domain	Cluster	Standard
		<p>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>
		<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
		<p>7. Understand ordering and absolute value of rational numbers.</p> <p>a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. <i>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.</i></p> <p>b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. <i>For example, write $-3^{\circ}\text{C} > -7^{\circ}\text{C}$ to express the fact that -3°C is warmer than -7°C.</i></p> <p>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. <i>For example, for an account balance of -30 dollars, write $-30 = 30$ to describe the size of the debt in dollars.</i></p> <p>d. Distinguish comparisons of absolute value from statements about order. <i>For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.</i></p>
		<p>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>

Expressions and Equations

Domain	Cluster	Standard
Expressions and Equations	Apply and extend previous understandings of arithmetic to algebraic expressions.	1. Write and evaluate numerical expressions involving whole-number exponents.
		2. Write, read, and evaluate expressions in which letters stand for numbers. <ol style="list-style-type: none"> a. Write expressions that record operations with numbers and with letters standing for numbers. <i>For example, express the calculation "Subtract y from 5" as $5 - y$.</i> b. 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. <i>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.</i> c. 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). <i>For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.</i>
		3. Apply the properties of operations to generate equivalent expressions. <i>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 $3y$.</i>
		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). <i>For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.</i>
	Reason about and solve one-variable equations and inequalities.	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. 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. 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.
		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.
	Represent and analyze quantitative relationships between dependent and independent variables.	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. <i>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>

Domain	Cluster	Standard
Geometry	Solve real-world and mathematical problems involving area, surface area, and volume.	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.
		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.
		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.
		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.
Statistics and Probability	Develop understanding of statistical variability.	1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. <i>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.</i>
		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.
	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.	
Summarize and describe distributions.	4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	
	5. Summarize numerical data sets in relation to their context, such as by: <ol style="list-style-type: none"> Reporting the number of observations. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. 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. 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. 	

Major Content	Supporting Content	Additional Content

- I know the following standard conversions: 1 foot = 12 inches, 1 yard = 3 feet, 1 day = 24 hours, 1 meter = 1000 millimeters, 1 gram = 1000 milligrams, 1 liter = 1000 cubic centimeters. I can perform conversions on both standard and metric units.
- I can use integers to describe quantities having opposite directions or values.
- I can use integers to represent quantities in real-world context, while explaining the meaning of 0 in each situation.

- I can describe a rational number as a point on a number line and graph both positive and negative numbers on the same axes.
- I can describe the ways that a negative sign, as an opposite, affects a number and its location on the number line. I can locate and describe the position of rational numbers in all four quadrants of the coordinate plane.
- I can recognize that when only the sign changes in an ordered pair, the points relate by reflections across axes.
- I can find, plot and describe the position of integers and rational numbers on horizontal and vertical number lines and on the coordinate plane.
- I can order rational numbers and their absolute values on a number line.
- I can interpret and describe that an inequality can represent the position of two numbers on a number line.
- I can write, interpret, and explain the order of rational numbers in real-world contexts.
- I can describe how the absolute value of rational numbers relates to its distance from zero.
- I can describe and use magnitude to represent the absolute value in the real-world.
- I can graph points in all four quadrants of the coordinate plane to solve a real-world problem.
- I can find either a vertical or horizontal distance between points on the coordinate plane.
- I can compare, order and locate all positive and negative rational numbers on a number line.
- I can fluently divide multi-digit numbers using the standard algorithm without the use of a calculator.
- I can fluently add, subtract, multiply and divide multi-digit decimals using the standard algorithm for each operation without the use of a calculator.

Ratios & Proportions

- I can understand the concept of a ratio as a comparison of two quantities.
- I can use ratio language to explain the relationship between two quantities (Part to Whole vs. Part to Part)
- I can explain the relationship of unit rates to ratios.
- I can use rate language to describe the relationship of two quantities.
- I can find and apply unit rates to solve real-world problems using multiple representations.
- I can find equivalent ratios using a table and graph the results on the coordinate plane.
- I can use tables to compare ratios and explain my reasoning.
- I can solve problems involving unit rates.
- I can use a percent as a value out of 100 to find the percent of a quantity.
- I can find the quantity given a part and the percent.

Expressions and Equations

- I can use the order of operations to simplify expressions which include addition, subtraction, multiplication, division, whole-number exponents and parentheses.
- I can translate verbal expressions into algebraic expressions and evaluate them for specific values.
- I can translate between verbal and algebraic expressions.
- I can identify all parts of an expression using the following mathematical terms:
 - Sum
 - Term
 - Product
 - Factor
 - Quotient
 - Coefficient
- I can simplify expressions to show equivalency.
- I can substitute and solve for given values of a variable.
- I can substitute and solve for a given value in a formula.
- I can apply number properties, such as commutative, associative, and distributive, to find equivalent expressions.
- I can identify two expressions are equivalent by using various methods (substitution, number properties).
- I can simplify expressions by combining like terms to show equivalency.
- I can write algebraic expressions to represent real world situations.
- I can solve real-world problems using algebraic expressions.
- I can use manipulatives to model algebraic expressions and equations.
- I can explain the difference between expressions and equations.
- I can determine which values make an algebraic equation or inequality true.
- I can use substitution to determine if a solution is true.
- I can write and solve a one-step addition or subtraction equation that models a situation.
- I can write and solve a one-step multiplication or division equation that models a situation
- I can write an inequality that represents a constraint to a mathematical problem.
- I can solve and graph and graph the solution sets of inequalities on a number line.
- I can use substitution to determine if a number makes the inequality a true statement and makes sense based on the scenario.
- I can solve one-step equations using fractions or decimals.
- I can represent inputs and outputs as variables to represent two quantities in a real world problem that change in relation to one another.
- I can recognize and identify the variables representing quantities as the independent and dependent variables.
- I can compare the relationship between dependent and independent variables in equations using graphs and tables.

Geometry

- I can find the area of triangles, special quadrilaterals, and polygons by creating triangles and rectangles within the shape.
- I can use basic area strategies to solve both real-world and mathematical problems.
- I can draw polygons on the coordinate plane when given the ordered pairs.
- I can find side lengths of polygons using the coordinate plane by calculating horizontal or vertical distances.
- I can apply these graphing strategies in real-world and mathematical problems.
- I know the formula for the area of a rectangle is $A=lw$ or $A =bh$.
- I can determine the volume of rectangular prisms with fractional edge lengths using unit cubes.
- I can show that volume is equivalent when multiplying the edge length of the prism.
- I can apply the volume formulas to find the volume of rectangular prisms with fractional edge lengths.
- I can represent three dimensional figures using nets.
- I can find surface area of three dimensional figures using nets.
- I can use nets and surface area to solve real-world and mathematical problems.

Statistics & Probability

- I can formulate a statistical question and I can interpret the variability of data collected from a survey.
- I can construct a graph to represent the statistical data that was collected in a survey.
- I can describe a set of data, as an answer of a statistical question, by its center, spread, and overall shape.
- I can recognize and explain the similarities and differences of how the mean and the median both represent the center of a set of data.
- I can display data in plots on a number line, in dot plots, histograms, and box plots.
- I can summarize numerical data sets in different ways.
- I can summarize data by reporting the number of observations.
- I can summarize data by describing how the data was collected.
- I can summarize data, including patterns, by
 - calculating the mean of the data set.
 - identifying outliers in the data set.
 - finding the median of the data set.
 - computing the range of the distribution as a measure of variability.
 - computing the interquartile range as a measure of variability.
 - computing the mean absolute deviation as a measure of variability.
 - describing the shape of the distribution of the data.
 - determining the relationship between the mean and median in a data set.

L. Tennessee State Assessment Information - State Math Assessments: April 26th, 27th

Grade 6			
	# of Items	# of Score Points	% of Test
Number Relationships <ul style="list-style-type: none"> • **6.NS.A–Apply and extend previous understandings of multiplication and division to divide fractions by fractions. • 6.NS.B–Compute fluently with multi-digit numbers and find common factors and multiples. • **6.NS.C–Apply and extend previous understandings of numbers to the system of rational numbers. 	14–19	17–21	34–35
Ratios and Rates <ul style="list-style-type: none"> • **6.RP.A–Understand ratio concepts and use ratio reasoning to solve problems. 	4–6	5–8	10–13
Expressions and Equations <ul style="list-style-type: none"> • **6.EE.A–Apply and extend previous understandings of arithmetic to algebraic expressions. • **6.EE.B–Reason about and solve one-variable equations and inequalities. • **6.EE.C–Represent and analyze quantitative relationships between dependent and independent variables. 	13–17	15–19	30–32
Geometry and Data <ul style="list-style-type: none"> • 6.G.A–Solve real-world and mathematical problems involving area, surface area, and volume. • 6.SP.A–Develop understanding of statistical variability. • 6.SP.B–Summarize and describe distributions. 	6–10	8–12	16–20
Total	37–52	*50–60	100%