8th Grade Math Syllabus, 2018-2019 School Year

Northview Jr. Academy, Sevier County School System

Teacher: Tracy Gallant

**Course Calendar: Organized by Six Weeks**

**1st Six Weeks: Unit 1**

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| 1.1 RATIONAL AND IRRATIONAL NUMBERS | 2.1INTEGER EXPONENTS |
| 1.2SETS OF REAL NUMBERS | 2.2SCIENTIFIC NOTATION WITH POSITIVE POWERS OF 10 |
| 1.3ORDERING REAL NUMBERS | 2.3SCIENTIFIC NOTATION WITH NEGATIVE POWERS OF 10 |
|  | 2.4OPERATIONS WITH SCIENTIFIC NOTATIONS |

**2nd Six Weeks: Unit 2**

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| 3.1REPRESENTING PROPORTIONAL RELATIONSHIPS | 5.1WRITING LINEAR EQUATIONS FROM SITUATIONS AND GRAPHS |
| 3.2RATE OF CHANGE AND SLOPE | 5.2WRITING LINEAR EQUATIONS FROM A TABLE |
| 3.3INTERPRETING THE UNIT RATE AS SLOPE | 5.3LINEAR RELATIONSHIPS AND BIVARIATE DATA |
| 4.1REPRESENTING LINEAR NON PROPORTIONAL RELATIONSHIPS | 6.1IDENTIFYING AND REPRESENTING FUNCTIONS |
| 4.2DETERMINING SLOPE AND Y-INTERCEPT | 6.2DESCRIBING FUNCTIONS |
| 4.3GRAPHING LINEAR NON PROPORTIONAL RELATIONSHIPS USING SLOPE AND Y-INTERCEPT | 6.3COMPARING FUNCTIONS |
| 4.4PROPORTIONAL AND NON- PROPORTIONAL SITUATIONS | 6.4ANALYZING GRAPHS |

**3rd Six Weeks: Unit 3**

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| 7.1EQUATIONS WITH VARIABLES ON BOTH SIDES | 8.1SOLVING SYSTEMS OF LINEAR EQUATIONS BY GRAPHING  |
| 7.2EQUATIONS WITH RATIONAL NUMBERS | 8.2SOLVING SYSTEMS BY SUBSTITUTION  |
| 7.3EQUATIONS WITH THE DISTRIBUTIVE PROPERTY | 8.3SOLVING SYSTEMS BY ELIMINATION |
| 7.4EQUATIONS WITH MANY SOLUTIONS OR NO SOLUTION | 8.4SOLVING SYSTEMS BY ELIMINATION WITH MULTIPLICATION |
|  | 8.5SOLVING SPECIAL SYSTEMS |

**4th Six Weeks: Unit 4 and First Half of Unit 5**

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| 9.1PROPERTIES OF TRANSLATIONS | 10.1PROPERTIES OF DILATIONS  |
| 9.2PROPERTIES OF REFLECTIONS | 10.2ALGEBRAIC REPRESENTATIONS OF DILATIONS  |
| 9.3PROPERTIES OF ROTATIONS  | 10.3SIMILAR FIGURES |
| 9.4ALGEBRAIC REPRESENTATIONS OF TRANSFORMATIONS | 11.1PARALLEL LINES CUT BY TRANSVERSAL  |
| 9.5CONGRUENT FIGURES | 11.2ANGLE THEOREMS FOR TRIANGLES |
|  | 11.3ANGLE-ANGLE SIMILARITY |

**5th Six Weeks: Second Half of Unit 5 and Unit 6**

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| 12.1THE PYTHAGOREAN THEOREM | 13.3VOLUME OF SPHERES |
| 12.2CONVERSE OF THE PYTHAGOREAN THEOREM | 14.1SCATTER PLOTS AND ASSOCIATION |
| 12.3 DISTANCE BETWEEN TWO POINTS | 14.2TREND LINES AND PREDICTIONS  |
| 13.1VOLUME OF CYLINDERS | 15.1TWO-WAY FREQUENCY TABLES |
| 13.2VOLUME OF CONES | 15.2TWO-WAY RELATIVE FREQUENCY TABLES |

**6th Six Weeks: Review for High School Algebra**

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| MonomialsMultiply and Divide with variables. | Functionsf(x) = g(x)Goes along with solving systems of equations by substitution.  |
| Polynomials | Proportional RelationshipDirectly and Inversely ProportionalD=RT |
| Adding and Subtracting Polynomials | Pythagorean Theorem |
| Multiplying a monomial by a polynomial | Multiplying a polynomial by a polynomial  |

**Textbook Information**

GO MATH, Middle School Grade 8

Published by Houghton Mifflin Harcourt

ISBN 978-0-544-05678-7

Note: A username and password will be sent home within the first two weeks of school so that the textbook and tutorial aids can be accessed at home.

**Major Required Assignments**

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| --- | --- | --- |
| Unit 1 TEST | End of 1st Six Weeks | Covers p. 7-66 |
| Unit 2 TEST | End of 2nd Six Weeks | Covers p. 71-189 |
| Unit 3 TEST | End of 3rd Six Weeks | Covers p. 197-271 |
| Units 4 & 5 TEST | End of 4th Six Weeks | Covers p. 279-370 |
| Units 5 & 6 TEST | End of 5th Six Weeks | Covers p. 375-425 |

**Middle School Grading Scale**

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| **Grade** | **Percent Range** |
| A |   95-100 |
|  A- |  93-94 |
|  B+ | 90-92 |
| B |  85-89 |
|   C+ |  83-84 |
| C |  75-82 |
|  C- |  73-74 |
| D | 70-72 |
| F | Less than 70 |

**Tennessee Math Practices**

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| Math Practices | Explanations and Examples |
| 1. Make sense of problems and persevere in solving them.
 | In grade 8, students solve real world problems through the application of algebraic and geometric concepts. Students seek the meaning of a problem and look for efficient ways to represent and solve it. They may check their thinking by asking themselves, “What is the most efficient way to solve the problem?”, “Does this make sense?”, and “Can I solve the problem in a different way?” |
| 1. Reason abstractly and quantitatively.
 | In grade 8, students represent a wide variety of real world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. They examine patterns in data and assess the degree of linearity of functions. Students contextualize to understand the meaning of the number or variable as related to the problem and decontextualize to manipulate symbolic representations by applying properties of operations. |
| 1. Construct viable arguments and critique the reasoning of others.
 | In grade 8, students construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.). They further refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students. They pose questions like “How did you get that?”, “Why is that true?” “Does that always work?” They explain their thinking to others and respond to others’ thinking. |
| 1. Model with mathematics.
 | In grade 8, students model problem situations symbolically, graphically, tabularly, and contextually. Students form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations. Students solve systems of linear equations and compare properties of functions provided in different forms. Students use scatterplots to represent data and describe associations between variables. Students need many opportunities to connect and explain the connections between the different representations. They should be able to use all of these representations as appropriate to a problem context. |
| 1. Use appropriate tools strategically.
 | Students consider available tools (including estimation and technology) when solving a mathematical problem and decide when certain tools might be helpful. For instance, students in grade 8 may translate a set of data given in tabular form to a graphical representation to compare it to another data set. Students might draw pictures, use applets, or write equations to show the relationships between the angles created by a transversal. |
| 1. Attend to precision.
 | In grade 8, students continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Students use appropriate terminology when referring to the number system, functions, geometric figures, and data displays. |
| 1. Look for and make use of structure.
 | Students routinely seek patterns or structures to model and solve problems. In grade 8, students apply properties to generate equivalent expressions and solve equations. Students examine patterns in tables and graphs to generate equations and describe relationships. Additionally, students experimentally verify the effects of transformations and describe them in terms of congruence and similarity. |
| 1. Look for and express regularity in repeated reasoning.
 | In grade 8, students use repeated reasoning to understand algorithms and make generalizations about patterns. Students use iterative processes to determine more precise rational approximations for irrational numbers. They analyze patterns of repeating decimals to identify the corresponding fraction.  During multiple opportunities to solve and model problems, they notice that the slope of a line and rate of change are the same value. Students flexibly make connections between covariance, rates, and representations showing the relationships between quantities. |

Tennessee Math Standards For 8th Grade

8.NS The Number System

* 8.NS.A Know that there are numbers that are not rational, and approximate them by rational numbers.
	+ 8.NS.A.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually or terminates, and convert a decimal expansion which repeats eventually or terminates into a rational number.
	+ 8.NS.A.2 Use rational approximations of irrational numbers to compare the size of irrational numbers locating them approximately on a number line diagram. Estimate the value of irrational expressions such as π².

8.EE Expressions and Equations

* 8.EE.A Work with radicals and integer exponents.
	+ 8.EE.A.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions.
	+ 8.EE.A.2 Use square root and cube root symbols to represent solutions to equations of the form x² = p and x³ = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.
	+ 8.EE.A.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities and to express how many times as much one is than the other.
	+ 8.EE.A.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
* 8.EE.B Understand the connections between proportional relationships, lines, and linear equations.
	+ 8.EE.B.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.
	+ 8.EE.B.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; know and derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.
* 8.EE.C Analyze and solve linear equations and systems of two linear equations.
	+ 8.EE.C.7 Solve linear equations in one variable.
		- 8.EE.C.7.a Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
		- 8.EE.C.7.b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
	+ 8.EE.C.8 Analyze and solve systems of two linear equations.
		- 8.EE.C.8.a Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
		- 8.EE.C.8.b Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.
		- 8.EE.C.8.c Solve real-world and mathematical problems leading to two linear equations in two variables.

8.F Functions

* 8.F.A Define, evaluate, and compare functions.
	+ 8.F.A.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. (Function notation is not required in 8th grade.)
	+ 8.F.A.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
	+ 8.F.A.3 Know and interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.
* 8.F.B Use functions to model relationships between quantities.
	+ 8.F.B.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models and in terms of its graph or a table of values.
	+ 8.F.B.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

8.G Geometry

* 8.G.A Understand and describe the effects of transformations on two-dimensional figures and use informal arguments to establish facts about angles.
	+ 8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations:
		- 8.G.A.1.a Lines are taken to lines, and line segments to line segments of the same length.
		- 8.G.A.1.b Angles are taken to angles of the same measure.
		- 8.G.A.1.c Parallel lines are taken to parallel lines.
	+ 8.G.A.2 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
	+ 8.G.A.3 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.
* 8.G.B Understand and apply the Pythagorean Theorem.
	+ 8.G.B.4 Explain a proof of the Pythagorean Theorem and its converse.
	+ 8.G.B.5 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
	+ 8.G.B.6 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
* 8.G.C Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.
	+ 8.G.C.7 Know and understand the formulas for the volumes of cones, cylinders, and spheres, and use them to solve real-world and mathematical problems.

8.SP Statistics and Probability

* 8.SP.A Investigate patterns of association in bivariate data.
	+ 8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
	+ 8.SP.A.2 Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line and informally assess the model fit by judging the closeness of the data points to the line.
	+ 8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.
* 8.SP.B Investigate chance processes and develop, use, and evaluate probability models
	+ 8.SP.B.4 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. Represent sample spaces for compound events using methods such as organized lists, tables, and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.

**Policies and Procedures**

Discipline Policy

The Discipline policy for both Sevier County Schools and Northview Junior Academy will be strictly followed.

Cell Phone Policy

The cell phone policy for both Sevier County Schools and Northview Academy will be strictly adhered to***. If there is an emergency and the parent needs to contact the school, please follow the guidelines and contact the school directly***. A message will be delivered to your student right away.

Movie Policy

The Sevier County Movie Policy will be adhered to.

The movie, ***Hidden Figures (PG),*** will be shown towards the year accompanied by an assignment. The objective of this project is to share a portion of NASA’s history and the usage of math formulas calculated by an individual as a primary source of the program’s success.