

ROBERTSON COUNTY SCHOOLS

State Standards – Mathematics

Learning Progressions

Kindergarten	1	2	3	4	5	6	7	8	HS
<u>Counting and Cardinality</u>									Number and Quantity
<u>Number and Operations in Base Ten</u>					<u>Ratios and Proportional Relationships</u>				
			<u>Number and Operations - Fractions</u>		<u>The Number System</u>				
<u>Operations and Algebraic Thinking</u>					<u>Expressions and Equations</u>				Algebra
								<u>Functions</u>	
<u>Geometry</u>					<u>Geometry</u>				Geometry
<u>Measurement and Data</u>					<u>Statistics and Probability</u>				Statistics and Probability

2023-2024

Eighth GRADE MATHEMATICS PACING GUIDE

2023-2024

EIGHTH GRADE MATHEMATICS PACING GUIDE

Newly Revised Tennessee Math Standards Grade 8

The Number System

This is the culminating area for the number system from 6th and 7th grade with the introduction of irrational numbers. Students learn that there are numbers that are not rational, called irrational numbers, and they approximate irrational numbers by rational numbers, locating them on a number line. Students estimate the value of irrational expressions

Expressions and Equations

Students work with radicals and integer exponents. Students understand the connections between proportional relationships, lines, and linear equations. Students advance their knowledge developed in 7th grade about equations to analyze and solve linear equations and pairs of simultaneous linear equations. Students use linear equations and systems of linear equations to represent, analyze, and solve a variety of problems. Students recognize equations for proportions ($y/x = m$ or $y = mx$) as special linear equations ($y = mx + b$), understanding that the constant of proportionality (m) is the slope, and the graphs are lines through the origin. They understand that the slope, m , of a line is a constant rate of change. They understand that if the input or x -coordinate changes then the output or y -coordinate changes as well with respect to the slope. Students will solve systems of two linear equation in two variables and relate the systems to pairs of lines in the plane. They learn that these lines will either intersect, be parallel, or are actually the same line, corresponding to a single solution, no solution, or infinite solutions. Students use linear equation, systems of linear equations, linear functions, and their understanding of slope of a line to analyze situations and solve real-world and mathematical problems.

Functions

8th grade begins the formal study of functions, a mathematical concept that for the student will continue throughout high school. Students grasp the concept of a function as a rule that assigns to each input exactly one output. They understand that functions describe situations where one quantity determines another. They can translate among representations and partial representations of functions (noting that tabular and graphical representations may be partial representations), and they describe how aspects of the function are reflected in the different representations. They do not have to learn function notation at this point but they do know and interpret the equation $y = mx + b$ as defining a linear function.

Geometry

Students informally explore translations, rotations, reflections, and dilations, laying groundwork for a deeper study of these in high school mathematics. Students use informal arguments to establish facts about the angle sum and exterior angle of triangles. Students explain and model the Pythagorean Theorem and its converse. They apply the Pythagorean Theorem to find distances between points on the coordinate plane and to find side lengths in right triangles. Students work with volume by solving problems involving cones, cylinders, and spheres.

Statistics and Probability

Students extend their knowledge from 7th grade by working with scatter plots for bivariate measurement data and understand linear associations and the use of linear models to solve problems interpreting the slope and intercept. Students will assess models by informally fitting a straight line and judging the closeness of the data points to the line. Students continue their work with probability from 6th and 7th grade by finding probability of compound events and represent the data using organized lists, tables, and tree diagrams.

Standards for Mathematical Practice

Being successful in mathematics requires the development of approaches, practices, and habits of mind that need to be in place as one strives to develop mathematical fluency, procedural skills, and conceptual understanding. The Standards for Mathematical Practice are meant to address these areas of expertise that teachers should seek to develop in their students. These approaches, practices, and habits of mind can be summarized as “processes and proficiencies” that successful mathematicians have as a part of their work in mathematics. Additional explanations are included in the main introduction of these standards.

Standards for Mathematical Practice
<ol style="list-style-type: none">1. Make sense of problems and persevere in solving them.2. Reason abstractly and quantitatively.3. Construct viable arguments and critique the reasoning of others.4. Model with mathematics.5. Use appropriate tools strategically.6. Attend to precision.7. Look for and make use of structure.8. Look for and express regularity in repeated reasoning.

Literacy Standards for Mathematics

Communication in mathematics employs literacy skills in reading, vocabulary, speaking and listening, and writing. Mathematically proficient students communicate using precise terminology and multiple representations including graphs, tables, charts, and diagrams. By describing and contextualizing mathematics, students create arguments and support conclusions. They evaluate and critique the reasoning of others, analyze, and reflect on their own thought processes. Mathematically proficient students have the capacity to engage fully with mathematics in context by posing questions, choosing appropriate problem-solving approaches, and justifying solutions. Further explanations are included in the main introduction.

Literacy Skills for Mathematical Proficiency
<ol style="list-style-type: none">1. Use multiple reading strategies.2. Understand and use correct mathematical vocabulary.3. Discuss and articulate mathematical ideas.4. Write mathematical arguments.

2023-2024 Eighth Grade Mathematics

A Year-at-a-Glance

1 st Nine Weeks	2 nd Nine Weeks
<p>Topic 1: Real Numbers (4.5 weeks) <i>8.NS.A.1, 8.NS.A.2, 8.EE.A.1, 8.EE.A.2, 8.EE.A.3, 8.EE.A.4, MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8</i></p> <p>Topic 2: Analyze and Solve Linear Equations (4.5 weeks) <i>8.EE.B.5, 8.EE.B.6, 8.EE.C.7a-b, 8.EE.C.9, MP1, MP2, MP3, MP4, MP6, MP7, MP8</i></p>	<p>Topic 3: Use Functions to Model Relationships (3.5 weeks) <i>8.F.A.1, 8.F.A.2, 8.F.A.3, 8.F.B.4, 8.F.B.5, MP1, MP2, MP3, MP4, MP5, MP7, MP8</i></p> <p>Topic 4: Investigate Bivariate Data (3.5 weeks) <i>8.SP.A.1, 8.SP.A.2, 8.SP.A.3, 8.SP.B.4, 8.F.A.3, 8.F.B.4, MP1, MP2, MP3, MP4, MP7, MP8</i></p> <p>Topic 5: Analyze and Solve Systems of Linear Equations (2 weeks) <i>8.EE.C.8a-c, 8.SP.A.3, 8.F.B.4, MP1, MP2, MP3, MP4, MP6, MP7, MP8</i></p>
<p><u>Mathematical Practices (MP)</u></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <ol style="list-style-type: none"> 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. </div> <div style="width: 48%;"> <ol style="list-style-type: none"> 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning. </div> </div>	
3 rd Nine Weeks	4 th Nine Weeks
<p>Topic 5: Analyze and Solve Systems of Linear Equations (1 week) <i>8.EE.C.8a-c, 8.SP.A.3, 8.F.B.4, MP1, MP2, MP3, MP4, MP6, MP7, MP8</i></p> <p>Topic 6: Congruence and Similarity (5 weeks) <i>8.G.A.1a-d, 8.G.A.2, 8.G.A.3, MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8</i></p> <p>Topic 7: Understand and Apply the Pythagorean Theorem (3 weeks) <i>8.G.B.3, 8.G.B.4, 8.G.B.5, MP1, MP2, MP3, MP4, MP7, MP8</i></p>	<p>Topic 8: Solve Problems Involving Surface Area and Volume (3 weeks) <i>8.G.C.6, MP1, MP2, MP3, MP4, MP6, MP7, MP8</i></p> <p>TNREADY BLITZ & Testing (3 weeks)</p> <p>Culminating Projects (3 weeks)</p>
<p><u>Literacy Skills for Mathematical Proficiency</u></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <ol style="list-style-type: none"> 1. Use multiple reading strategies. 2. Understand and use correct mathematical vocabulary. </div> <div style="width: 48%;"> <ol style="list-style-type: none"> 3. Discuss and articulate mathematical ideas. 4. Write mathematical argument. </div> </div>	

****The suggested pacing for each lesson is 2 days for a 45 minute math class and 1 day for a 90 minute math class.****

1st Quarter - Topic 1: Real Numbers (Suggested Time = 4.5 weeks)

[IFD Grade 8 Instructional Focus Document \(tnedu.gov\)](http://tnedu.gov)

Essential Question: <i>What are Real Numbers? How are Real Numbers used to solve problems?</i>		
Standards		
<p>8.NS.A.1 - Know that real numbers that are not rational are called irrational (e.g., π, $\sqrt{2}$, etc.). 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.</p> <p>8.NS.A.2 - Use rational approximations of irrational numbers to compare the size of irrational numbers by locating them approximately on a number line diagram. Estimate the value of irrational expressions (such as π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.</p> <p>8.EE.A.1 - Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$</p> <p>8.EE.A.2 - Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes.</p> <p>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. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger.</p> <p>8.EE.A.4 – Using technology, solve real-world problems with numbers expressed in decimal and scientific notation. 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)</p>		
Vocabulary	Mathematical Practices	Textbook Correlations
Irrational number, perfect square, square root, cube root, perfect cube, Power of Products Property, product of Powers Property, Quotient of Powers Property, Negative Exponent Property, Zero Exponent Property, scientific notation	<p>MP2: Reason abstractly and quantitatively.</p> <p>MP7: Look for and make use of structure</p>	<p>Topic 1: Lessons 1 – 10</p> <p>3-Act Mathematical Modeling Lesson Hard-Working Organs</p> <ul style="list-style-type: none"> Between lessons 1-9 and 1-10

Learning Targets

- Locate repeating decimals on a number line
- Write repeating decimals as fractions
- **Determine will decimal expansion of a fraction will terminate or repeat**
- **Show that decimal expansion of rational numbers eventually repeats or terminates**
- Classify a number as rational or irrational, **including square and cube roots**
- Understand the concepts of square roots and perfect squares
- Approximate square roots by using perfect squares
- Compare and order rational and irrational numbers
- **Explain how irrational numbers differ from rational numbers**
- Evaluate square roots and cube roots to solve problems
- Evaluate perfect squares and perfect cubes
- Solve equations involving perfect squares or cubes
- Solve Equations involving imperfect squares or cubes
- Multiply and divide expressions with integer exponents
- Find the power of a power
- Simplify exponential expressions using the Zero Exponent Property and the Negative Exponent Property
- Estimate and compare very large and very small quantities using powers of 10
- **Rewrite numerical expressions with fractional bases raised to a power**
- Write very large and very small numbers in scientific notation
- **Choose units of appropriate size expressed in scientific notation to represent small and large quantities in real-world context**
- **Using technology: add, subtract, multiply, and divide numbers in scientific notation**

- Use mathematical modeling to represent a problem situation and to propose a solution
- Test and verify the appropriateness of math models

1st Quarter - Topic 2 : Analyze and Solve Linear Equations (Suggested Time = 4.5 weeks)

[IFD Grade 8 Instructional Focus Document \(tnedu.gov\)](http://tnedu.gov)

Essential Question: *How can we analyze connections between linear equations and use them to solve problems?*

Standards

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. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed

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 apply 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.9 - By graphing on the coordinate plane or by analyzing a given graph, determine the solution set of a linear inequality in one or two variables.

8.EE.C.7 - Solve linear equations in one variable.

- **8.EE.C.7a** - 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.7b** - Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and combining like terms

Vocabulary	Mathematical Practices	Textbook Correlations
Slope-intercept form	<ul style="list-style-type: none"> Model with Mathematics Look for and Make Use of Structure 	Topic 2: Lessons 1 – 9 TN - 1
Learning Targets		
<ul style="list-style-type: none"> Solve equations with like terms on one side of the equation Solve equations requiring using the distributive property. Make sense of scenarios and represent them with equations Solve equations with like terms on both sides of the equation Make sense of scenarios and represent them with equations Plan multiple solution pathways and choose one to find the solution Determine the number of solutions to an equation Use mathematical modeling to represent a problem situation and to propose a solution Test and verify the appropriateness of their math models Graph a given proportional relationship 		<p>3-Act Mathematical Modeling Lesson Powering Down</p> <ul style="list-style-type: none"> Between 2-4 and 2-5 Use mathematical modeling to represent a problem situation and to propose a solution Test and verify the appropriateness of their math models

- **Identify a slope from a provided graph of a proportional relationship and connect it to the unit rate.**
- **Compare two different proportional relationships represented in a different ways.**
- Interpret a slope in context and relate it to steepness on a graph
- Understand how the constant of proportionality and the slope relate in a linear equation
- Write and graph a linear equation in the form of $y=mx$
- **Explain and choose a representation demonstrating that the slope is the same between any 2 points using similar triangles.**
- Interpret and extend the table or graph of a linear relationship to find its y-intercept
- Analyze graphs in context to determine and explain the meaning of the y-intercept
- Graph a line from an equation in the form $y = mx + b$
- Write an equation that represents the given graph of a line
- Graph the solution set of a linear inequality in two variables
- Analyze a given graph to determine the solution set of a linear inequality.

- Explain why the results from their mathematical models may not align exactly to the problem situation

2nd Quarter - Topic 3 : Solve One Variable Equations (Suggested Time = 4 weeks)

[IFD Grade 8 Instructional Focus Document \(tnedu.gov\)](http://tnedu.gov)

Essential Question: <i>How can you use functions to model linear relationships?</i>		
Standards:		
<p>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.)</p> <p>8.F.A.2 - Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and another linear function represented by an algebraic expression, determine which function has the greater rate of change.</p> <p>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. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line</p> <p>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</p> <p>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.</p>		
Vocabulary	Mathematical Practices	Textbook Correlations
Relation, function, constant rate of change, initial value, linear function, nonlinear function, interval	<ul style="list-style-type: none"> Model with Mathematics Look for and Make Use of Structure 	Topic 3: Lessons 1 – 9 TN - 1
Learning Targets		3-Act Mathematical Modeling Lesson Powering Down
<ul style="list-style-type: none"> Solve equations with like terms on one side of the equation Solve equations requiring using the distributive property. Make sense of scenarios and represent them with equations Solve equations with like terms on both sides of the equation Make sense of scenarios and represent them with equations Plan multiple solution pathways and choose one to find the solution 		<ul style="list-style-type: none"> Between 2-4 and 2-5 Use mathematical modeling to represent a problem situation and to propose a solution

- Determine the number of solutions to an equation
- Use mathematical modeling to represent a problem situation and to propose a solution
- Test and verify the appropriateness of their math models
- **Graph a given proportional relationship**
- **Identify a slope from a provided graph of a proportional relationship and connect it to the unit rate.**
- **Compare two different proportional relationships represented in a different ways.**
- Interpret a slope in context and relate it to steepness on a graph
- Understand how the constant of proportionality and the slope relate in a linear equation
- Write and graph a linear equation in the form of $y=mx$
- **Explain and choose a representation demonstrating that the slope is the same between any 2 points using similar triangles.**
- Interpret and extend the table or graph of a linear relationship to find its y-intercept
- Analyze graphs in context to determine and explain the meaning of the y-intercept
- Graph a line from an equation in the form $y = mx + b$
- Write an equation that represents the given graph of a line
- Graph the solution set of a linear inequality in two variables
- Analyze a given graph to determine the solution set of a linear inequality.

- Test and verify the appropriateness of their math models
- Explain why the results from their mathematical models may not align exactly to the problem situation

2nd Quarter - Topic 4 : Investigate Bivariate Data (Suggested Time = 4 weeks)

[IFD Grade 8 Instructional Focus Document \(tnedu.gov\)](http://tnedu.gov)

Essential Question: *How can you represent the relationship between paired data and use the representation to make predictions?*

Standards

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 linear 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 intercepts. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.

8.SP.B.4 - Find probabilities of and represent sample spaces for compound events using organized lists, tables, tree diagrams, and simulation.

- **8.SP.B.4a** - 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

- **8.SP.B.4b** - 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.

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. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.

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.

Vocabulary

Mathematical Practices

Textbook Correlations

<p>Cluster, gap, measurement, data, negative association, outlier, positive association, scatter plot, trend line, categorical data, compound event, simulation</p>	<ul style="list-style-type: none"> • Model with Mathematics • Look for and Make Use of Structure 	<p>Topic 4: Lessons 1-3 TN – 2, TN – 3, TN – 4</p>
<p>Learning Targets</p>		
<ul style="list-style-type: none"> • Construct a scatter plot graph to model paired data • Utilize a scatter plot to identify and interpret the relationship between paired data • Recognize whether the paired data has a linear association, a nonlinear association, or no association • Draw a trend line to determine whether a linear association is positive or negative and strong or weak • Determine which trend line most closely models the data. • Determine the accuracy of a line of fit based on its closeness to datapoints. • Use the slope and y-intercept of a trend line to make a prediction • Interpret the given slope or y intercept of a linear model • Make a prediction when no equation is given by drawing trend lines and writing the equation of the linear model • Organize paired categorical data into a tow-way frequency table • Use a tree diagram, a table, or an organized list to represent the sample space for a compound event • Organize information about a compound even on a table, a tree diagram, or an organized list • Find the probability of a compound event using lists, tables, tree diagrams, and simulations • Use different tools to simulate a compound event • Compare compound probabilities • Model a real-world compound event and predict its outcome using a simulation. 		<p>3-Act Mathematical Modeling Lesson Powering Down</p> <ul style="list-style-type: none"> • Between 4-5 and TN – 2 • Use mathematical modeling to represent a problem situation and to propose a solution • Test and verify the appropriateness of their math models • Explain why the results from their mathematical models may not align exactly to the problem situation

2nd/3rd Quarter - Topic 5 : Analyze and Solve Systems of Linear Equations (Suggested Time = 3 weeks)

[IFD Grade 8 Instructional Focus Document \(tnedu.gov\)](http://tnedu.gov)

Essential Question: <i>What does it mean to solve a system of linear equations?</i>		
Standards		
<p>8.EE.C.8 - Analyze and solve systems of two linear equations graphically.</p> <p>- 8.EE.C.8a - 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.</p> <p>- 8.EE.C.8b - Estimate solutions by graphing a system of two linear equations in two variables. Identify solutions by inspecting graphs.</p>		
Vocabulary	Mathematical Practices	Textbook Correlations
System of linear equations, solution of a system of linear equations	<ul style="list-style-type: none"> • Reason Abstractly and Quantitatively • Look for and Make Use of Structure 	<p>Topic 5: Lessons 1-2, 3-Act Math Modeling</p> <p>Lessons 3-4 are no longer in 8th grade standards, but can be taught for enrichment, since students will struggle with this in Algebra 1.</p>
Learning Targets		
<ul style="list-style-type: none"> • Examine graphs of linear systems of equations to determine the number of solutions, based on number of intersection points • Compare the equations in a linear system to look for a relationship between the number of solutions and the slopes and y-intercepts of the equations • Create and examine graphs of linear systems of equations to determine the solution 		<p style="text-align: center;">3-Act Mathematical Modeling Lesson: Ups and Downs</p> <ul style="list-style-type: none"> • After Main Lessons • Use mathematical modeling to represent a problem situation and to propose a solution • Test and verify the appropriateness of their math models • Explain why the results from their mathematical models may not align exactly to the problem situation

3rd Quarter - Topic 6 : Congruence and Similarity (Suggested Time = 5 weeks)

[IFD Grade 8 Instructional Focus Document \(tnedu.gov\)](http://tnedu.gov)

Essential Question: <i>How can you show that two figures are either congruent or similar to one another?</i>		
<p>Standards</p> <p>8.G.A.1 - Describe the effect of translations, rotations, reflections, and dilations on two-dimensional figures using coordinates.</p> <ul style="list-style-type: none"> - 8.G.A.1a - Verify informally that lines are taken to lines, and determine when line segments are taken to line segments of the same length - 8.G.A.1b - Verify informally that angles are taken to angles of the same measure - 8.G.A.1c - Verify informally that parallel lines are taken to parallel lines - 8.G.A.1d - Make connections between dilations and scale factors <p>8.G.A.2 - 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</p> <p>8.G.B.3 - Explain a model of the Pythagorean Theorem and its converse</p>		
Vocabulary	Mathematical Practices	Textbook Correlations
Transformation, translation, image, reflection, line of reflection, rotation, angle or rotation, center of rotation, congruent, dilation, scale factor, enlargement, reduction, similar, transversal, corresponding angles, alternate interior angles, same-side interior angles, remote interior angles, exterior angle of a triangle	<ul style="list-style-type: none"> • Reason Abstractly and Quantitatively • Construct Viable Arguments and Critique the Reasoning of Others • 	<p>Topic 6: Lessons 1-10</p> <p style="text-align: center;">3-Act Mathematical Modeling Lesson Tricks of the Trade</p> <ul style="list-style-type: none"> • Between 6-4 and 6-5 • Use mathematical modeling to represent a problem situation and to propose a solution • Test and verify the appropriateness of their math models • Explain why the results from their mathematical models may not align exactly to the problem situation
Learning Targets		
<ul style="list-style-type: none"> • Understand translations • Translate a figure on a coordinate plane • Describe the effects of a translation • Understand and describe a reflection • Reflect two-dimensional figures • Identify and perform a rotation • Determine how a rotation affects a two-dimensional figure • Understand a sequence of transformations • Describe and perform a sequence of transformations • Understand congruence of figures using a series of transformation 		

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| <ul style="list-style-type: none">• Identify congruent figures• Understand dilations• Dilate to enlarge or reduce a figure in a coordinate plane• Understand similarity• Complete a similarity transformation• Identify similar figures• Understand the relationships of angles formed by parallel lines and a transversal• Find unknown angle measures• Understand the relationship of the interior angles of a triangle• Determine whether triangles are similar• Solve problems involving similar triangles | |
|--|--|

3rd Quarter - Topic 7 : Understand and Apply the Pythagorean Theorem (Suggested Time = 3 weeks)

[IFD Grade 8 Instructional Focus Document \(tnedu.gov\)](http://tnedu.gov)

Essential Question: <i>How can you use the Pythagorean Theorem to solve problems?</i>		
Standards		
<p>8.G.B.3 - Explain a model of the Pythagorean Theorem and its converse</p> <p>8.G.B.4 - Know and apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.</p> <p>8.G.B.5 - Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.</p>		
Vocabulary	Mathematical Practices	Textbook Correlations
Hypotenuse, leg, Pythagorean Theorem, proof, Converse of the Pythagorean Theorem	<ul style="list-style-type: none"> • Construct Viable Arguments and Critique Reasoning • Look for and Make Use of Structure 	<p>Topic 7: Lessons 1-4</p> <p style="text-align: center;">3-Act Mathematical Modeling Lesson Go with the Flow</p>
Learning Targets		
<ul style="list-style-type: none"> • Explain why double the base and the height of a triangle, the area is more than double • Use a model to explain the Pythagorean Theorem • Given Two side lengths of a right triangle, use the Pythagorean Theorem to find the length of the third side • Understand why the Converse of the Pythagorean Theorem is true • Apply the Converse of the Pythagorean Theorem to identify right triangles • Use the Converse of the Pythagorean Theorem to analyze two-dimensional shapes • Apply the Pythagorean Theorem and its converse to solve real-world problems • Apply the Pythagorean Theorem to solve problems that involve three dimensions • Apply the Pythagorean Theorem to find the distance between two points on a map or coordinate plane • Find the perimeter of a figure on a coordinate plane • Identify the coordinates of the third vertex of a triangle on the coordinate plane 		<ul style="list-style-type: none"> • Before 7-1 • Use mathematical modeling to represent a problem situation and to propose a solution • Test and verify the appropriateness of their math models • Explain why the results from their mathematical models may not align exactly to the problem situation

4th Quarter - Topic 8 : Solve Problems Involving Volume (Suggested Time = 2 weeks)

[IFD Grade 8 Instructional Focus Document \(tnedu.gov\)](http://tnedu.gov)

Essential Question: <i>How are the formulas for volume of a cylinder, cone, and sphere related to one another?</i>		
Standards		
8.G.C.6 - Apply the formulas for the volumes of cones, cylinders, and spheres to solve real-world and mathematical problems.		
Vocabulary	Mathematical Practices	Textbook Correlations
Cone, cylinder, sphere, composite figure	<ul style="list-style-type: none"> Reason Abstractly and Quantitatively Look for and Make Use of Structure 	<p>Topic 8: Lessons 2-4; 3-Act Math Modeling: Measure Up</p> <ul style="list-style-type: none"> Lesson 1 focuses on conceptual understanding of Cones and Cylinders. However, finding Surface Area is not an 8th grade standard. Be sure to demonstrate relationship of Cones and Cylinders clearly so students fully grasp Volume. <p style="text-align: center;">3-Act Mathematical Modeling Lesson Go with the Flow</p> <ul style="list-style-type: none"> After 8-4 Use mathematical modeling to represent a problem situation and to propose a solution Test and verify the appropriateness of their math models Explain why the results from their mathematical models may not align to the problem situation
Learning Targets		
<ul style="list-style-type: none"> Justify the relationships between the volume of a rectangular prism and the volume of a cylinder Solve real-world problems involving the volume of a cylinder Use the formula for the volume of a cylinder to find an unknown measure Justify the relationship between the volume of a cylinder and the volume of a cone Use the Pythagorean Theorem when solving volume problems Find the volume of a cone. Given the circumference of the base, find the volume of a cone Justify the relationship between the volume of a cone and the volume of a sphere Find the volume of a sphere. Given the surface area, find the volume of a sphere Explain how the volume formulas for a cone and a pyramid are related Apply volume formulas to solve real-world or mathematical problems involving cones, cylinders, and spheres 		

4th Quarter - Topic 9: Review and Culminating Projects

Essential Question:

TNReady Review Blitz & Testing (4 weeks)

State Testing (2 weeks)

Culminating Projects (3 weeks)

Vocabulary

Mathematical Practices

Textbook Correlations

Tennessee Standards Practice Guide – New with our current textbook adoption.