

# **Madison Public Schools**

## **Math 8 Curriculum**

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## Course Overview

### Description

Math 8 is an exploration of a wide range of topics that will prepare students for high school and college level courses. Students will build upon their knowledge of expressions and equations to understand the use of linear equations to model bivariate data and solve systems of equations representing real world problems. Students will develop an understanding of functions and how they describe quantitative relationships and be able to represent functions in multiple ways. Students will build upon their knowledge of distance and angles to perform transformations on the coordinate plane and to understand the Pythagorean Theorem and its converse. Students will extend their understanding of three-dimensional figures by studying cylinders, cones, and spheres. Acquired skills will be utilized to solve real world problems that relate to students' everyday lives. Students will be given opportunities to defend their reasoning and critique the reasoning of others using appropriate Mathematical vocabulary. This curriculum is aligned to the New Jersey Student Learning Standards for Grade 8 and the Standards for Mathematical Practice.

### Goals

This course aims to:

- develop conceptual understanding of equations, functions, and geometric concepts in order to increase proficiency.
- encourage habits of inquiry and analysis to internalize concepts for a deeper and more abstract understanding.
- utilize a variety of strategies and efficiently implement procedures to solve math problems.
- utilize critical thinking and reasoning to understand and explain mathematical processes, including their own and others.
- develop and enhance fundamental basic principles such as place value, fractions, and decimals.
- utilize the language of math to effectively communicate and comprehend mathematical problems.
- use, apply, and model real life situations to provide meaningful connections.
- implement a variety of tools and technology for solving mathematical problems.
- build student confidence and encourage perseverance with the various approaches, tools, and vocabulary.

### Materials

**Core:** Big Ideas Red Book (Blue)

**Supplemental:** Edulastic, illustrative Math, Khan Academy, Kahoot, Quizizz, IXL

### Resources

[Suggested activities and resources page](#)

### Benchmarks

Students will take the [STAR](#) Mathematics assessment a minimum 3 times during the school year.

## **Modifications and Adaptations for Special Needs Learners**

(Gifted and Talented Students, English Language Learners, Special Education Students, At-Risk Students)

### **Scope and Sequence (Pacing Guide)**

<b>Unit Number</b>	<b>Topic of Study</b>	<b>Duration (Weeks Taught)</b>
1	Equations	3 weeks
2	Real Numbers and the Pythagorean Theorem	3 weeks
3	Exponents and Scientific Notation	4 weeks
4	Linear Equations	4 weeks
5	Linear Functions	3 weeks
6	Systems of equations	3 weeks
7	Data Analysis and Displays	3 weeks
8	Transformations	4 weeks
9	Angles and Triangles	3 weeks
10	Volumes and Similar Solids	3 weeks

### **Unit 1 Equations**

Unit Title: Equations

Unit Summary: Students will explore the properties of equality and inverse operations to find solutions to simple and complex equations. The unit begins with a background knowledge check of concepts such as combining like terms, simplifying expressions, and operations with rational numbers. The students will then work with one-step equations in order to understand the properties of equality, and the importance of showing your work and checking your answers. The class will move to more complex equations where multiple steps will need to be performed in order to isolate the desired variable. Real world scenarios of equality will require students to create and solve equations that contain the same variable on both sides of the equation. In the final lesson of the unit, students will solve literal equations for a specific variable by utilizing inverse operations.

Suggested Pacing: 13 days (10 days for instruction, 3 days for review/assessment)

## Learning Targets

### Unit Essential Questions:

- How can you use inductive reasoning to discover rules in math?
- How can you solve a multi-step equation?
- How can you check the reasonableness of your answer?
- How can you use a formula for one measurement to write a formula for a different measurement?
- What applications require solving simultaneous linear equations?

### Unit Enduring Understandings:

- Inductive reasoning is writing a general rule based on examples.
- Equations can be solved by utilizing inverse operations so that variable terms are on one side and constant terms are on the other side.
- You can check the reasonable of answers by substituting the solution back into the original equation.

## Evidence of Learning

**Formative Assessments:** A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, Kahoot, Quizizz, IXL, independent practice, activities, questioning and discussions

### **Summative Assessments:** Unit 1 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 8 classes with flexibility for each teacher to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLS)	Pacing
Solve simple and multi-step equations using inverse operations of addition, subtraction, multiplication, or division.	<p><u>Content:</u> expression, variable, like terms, constant, coefficient, simplest form, Distributive Property, Commutative Property of Addition, integer, opposite</p> <p><u>Skills:</u> Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and combining like terms.</p>	<p>Do Now</p> <p>Exit Tickets</p> <p>Homework Results: Textbook problems, section worksheets.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p>1.1-1.2 Teacher created Quiz</p>	<p>8.EE.7a Give examples of linear equations in one variable with one solution.</p> <p>8.EE.7b Solve linear equations with rational number coefficients, including equations whose solutions require . . . collecting like terms.</p> <p>CRP4. Communicate clearly and effectively and with reason. Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals</p>	4 Days

			think about the audience for their communication and prepare accordingly to ensure the desired outcome.	
<p>Determine whether equations will have one solution, no solution, or infinitely many solutions.</p> <p>Rewrite equations to solve for one variable in terms of the other variables.</p>	<p><u>Content:</u> Properties of Equality, No Solution, Infinite Solution, Literal Equations.</p> <p><u>Skills:</u> Show that a linear equation in one variable has one solution, infinitely many solutions, or no solution by transforming the equation into simpler forms.</p>	<p>Do Now</p> <p>Exit Tickets</p> <p>Homework Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p>Unit 1 Teacher Created Summative Assessment</p>	<p>8.EE.7a Give examples of linear equations in one variable with one solution.</p> <p>8.EE.7b Solve linear equations with rational number coefficients, including equations whose solutions require . . . collecting like terms.</p> <p>8.EE.7 Solve linear equations in one variable.</p> <p>SMP7 Look for and make use of structure.</p>	6 Days

## Unit 2 Real Numbers & Pythagorean Theorem

Unit Title: Real Numbers & Pythagorean Theorem

Unit Summary: This unit begins with evaluating perfect squares and cubes, using real life experiences to gain an understanding of what square and cube roots are. The class will find missing lengths of right triangles using the pythagorean theorem, and explore the concept of non-perfect squares and cubes. Students will learn to classify the non-perfect squares as irrational numbers, and estimate their values using perfect squares and cubes as a guide.

Suggested Pacing: 16 days (13 days for instruction, 3 days for review/assessment)

### Learning Targets

Unit Essential Questions:

- Why does one need to distinguish between rational and irrational numbers?
- How can you find the dimensions of a square or circle when given its area?
- How is the cube root of a number different than the square root of a number?
- How are the lengths of the sides of a right triangle related?
- How can you find decimal approximation of square roots that are not rational?
- In what other ways can use Pythagorean Theorem?

Unit Enduring Understandings:

- Every irrational square root can be estimated by its location between two rational square roots.
- Pythagorean Theorem explains how the lengths of the sides of a right triangle are related.
- Pythagorean Theorem can be used to find distance.
- The sum of the legs squared equals the hypotenuse squared.

### Evidence of Learning

**Formative Assessments:** A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, Kahoot, Quizizz, IXL, independent practice, activities, questioning and discussions

## Summative Assessments: Unit 2 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 8 classes with flexibility for each teacher to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLS)	Pacing
<p>Find square roots of perfect squares.</p> <p>Find cube roots of perfect cubes.</p> <p>Evaluate expressions involving square roots and cube roots.</p> <p>Use square roots and cube roots to solve equations.</p>	<p><u>Content:</u> square root, perfect square, radical sign, radicand, cube root, perfect cube.</p> <p><u>Skills:</u> Evaluate square roots and cube roots, including those resulting from solving equations.</p> <p>Find side lengths of squares, and radiuses of circles when given the area</p> <p>Calculate the edge length of a cube when given the volume.</p>	<p>Do Now</p> <p>Exit Tickets</p> <p>Perfect Squares and Cubes Flash Cards</p> <p>Homework Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p>	<p>8.EE2 Use square root and cube root symbols to represent solutions to equations of the form <math>x^2 = p</math> and <math>x^3 = p</math>; evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that <math>\sqrt{2}</math> is irrational.</p>	5 Days
<p>Provide geometric proof of the Pythagorean Theorem.</p> <p>Use the Pythagorean Theorem to find unknown side lengths in right triangles.</p> <p>Use the pythagorean theorem and problem solving skills to find unknown measurements in real life situations.</p>	<p><u>Content:</u> Pythagorean Theorem, legs, hypotenuse, right triangles.</p> <p><u>Skills:</u> Use the Pythagorean Theorem to find missing measures of right triangles and distances between points in the coordinate plane.</p>	<p>Do Now</p> <p>Exit Tickets</p> <p>Homework Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p>Quiz 7.1-7.3 Created by teacher</p>	<p>8.G.6 Explain a proof of the Pythagorean Theorem and its converse.</p> <p>8.G.7 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.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.</p> <p>8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities.</p> <p>8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.</p>	3 Days
<p>Classify real numbers</p> <p>Define irrational numbers</p> <p>Approximate square roots</p> <p>Express rational numbers that are repeating decimals in fraction form</p>	<p><u>Content:</u> Irrational number, real numbers, repeating decimals.</p> <p><u>Skills:</u> Understand that every rational number has a decimal expansion that terminates or repeats</p> <p>Understand that numbers that are not rational are irrational.</p> <p>Compare irrational numbers using rational</p>	<p>Do Now</p> <p>Exit Tickets</p> <p>Homework Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p>Irrational Number Line</p>	<p>8.NS.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, and convert a decimal expansion which repeats into a rational number.</p> <p>8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions</p>	3 Days

	<p>approximations.</p> <p>Write repeating decimal as a fraction</p> <p>Estimate non-perfect square roots to nearest integer and tenths</p>		<p>NJSLSA.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.</p>	
<p>Identify right triangles using the converse of the Pythagorean Theorem.</p> <p>Find distances in a coordinate plane using Pythagorean Theorem.</p>	<p><u>Content:</u> Distance formula, converse of the Pythagorean Theorem</p> <p><u>Skills:</u> Explain a proof of the Pythagorean Theorem and its converse</p> <p>Use distance formula to find the distance between two points</p>	<p>Do Now</p> <p>Exit Tickets</p> <p>Homework Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p>Summative Unit Assessment created by teacher</p>	<p>8.G.6 Explain a proof of the Pythagorean Theorem and its converse.</p> <p>8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.</p>	2 Days

## Unit 3 Exponents & Scientific Notation

Unit Title: Exponents & Scientific Notation

**Unit Summary:** This unit begins with students learning that repeated multiplication with the same factor can be written in exponential notation. The class will utilize the properties of exponents to simplify expressions, and gain an understanding of what it means to evaluate a number with a negative, or zero power. The value of having scientific notation to write large and small values will be discussed, and students will apply the rules of these values to evaluate operations involving scientific notation.

**Suggested Pacing:** 19 days (16 days for instruction, 3 days for review/assessment)

### Learning Targets

**Unit Essential Questions:**

- Why does one need to express a number in a form with integer exponents?
- How can you use inductive reasoning to observe and write general rules involving properties of exponents?
- Why does one need to write numbers in scientific notation? What is the advantage of performing operations on numbers expressed in scientific notation rather than numbers in standard form?

**Unit Enduring Understandings:**

- Exponents can be used to represent repeated multiplication of the same number.
- Powers of ten can be used to represent very large and small numbers.
- The distributive and commutative properties can be utilized to perform operations on numbers expressed in scientific notation.

### Evidence of Learning

**Formative Assessments:** A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, Kahoot, Quizizz, IXL, independent practice, activities, questioning and discussions

**Summative Assessments:** Unit 3 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 8 classes with flexibility for each teacher to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

**Alternative Assessment: Astronomy Project** (Big Ideas Blue Book , Chapter 10 resource)

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLs)	Pacing
Write expressions using integer exponents.  Evaluate expressions involving integer exponents.	<u>Content:</u> power, base, exponent, negative and zero exponents  <u>Skills:</u>	Do Now  Exit Tickets  Homework Results: Textbook problems, section	8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions.	8 Days



<p>Find the product of powers with the same base.</p> <p>Find the power of a power.</p> <p>Divide powers with the same base.</p> <p>Evaluate expressions involving numbers with zero as an exponent.</p> <p>Evaluate expressions involving negative exponents.</p>	<p>Use the properties of integer exponents to generate equivalent expressions.</p>	<p>worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p>Properties of Exponents Quiz created by teacher</p>	<p>CRP4. Communicate clearly and effectively and with reason.</p>	
<p>Identify whether a number is written in scientific notation.</p> <p>Write scientific notation in standard form.</p> <p>Write numbers in scientific notation.</p> <p>Perform operations with numbers expressed in scientific notation and other forms.</p>	<p><u>Content:</u> power, base, exponent, standard form, scientific notation, operations with scientific notation</p> <p><u>Skills:</u> Use scientific notation to estimate very large or very small quantities.</p> <p>Interpret scientific notation that has been generated by technology.</p> <p>Use distributive property to add or subtract scientific notation with the same powers.</p> <p>Rewrite powers to add or subtract scientific notation that is not written with the same power.</p> <p>Use commutative property to multiply scientific notation.</p>	<p>Do Now</p> <p>Exit Tickets</p> <p>Homework Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p>Scientific Notation Project</p> <p><a href="#">Number of Stars in Galaxies</a></p> <p>Unit Summative Assessment created by teacher</p>	<p>8.EE.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.</p> <p>8.EE.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. Interpret scientific notation that has been generated by technology.</p> <p>MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.</p> <p>8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.</p>	8 Days

## Unit 4 Linear Equations

Unit Title: Linear Equations

**Unit Summary:** In this unit students will use their background knowledge from Unit 1 to evaluate equations with two variables, and create tables to find ordered pairs. These ordered pairs will be used to construct a graph of a linear equation. Once students have an understanding of how the graphs of linear equations are formed using inputs and outputs, the class will delve into creating linear graphs from equations without creating tables. The class will use intercepts and slope to create graphs, and use the same information from a graph to create an equation. Students will interpret the meaning of the rate of change and starting point from a real life situation, relating the information to slope-intercept form.

**Suggested Pacing:** 21 days (18 days for instruction, 3 days for review/assessment)

### Learning Targets

**Unit Essential Questions:**

- How can you recognize a linear equation?
- How can you represent a linear relationship?
- When is a relationship between two variables proportional?
- How can you use the slope and y-intercept of a line to describe the relationship between two quantities?

**Unit Enduring Understandings:**

- A linear equation represents a relationship between two quantities that change at a constant rate.
- Linear relationships can be represented by an equation, graph, or table.
- When two quantities are proportional, the relationship can be described as  $y=mx$ .
- Slope is a rate of change, or the change in the y values/x values. Slope describes how two quantities change in relation to one another.
- Linear equations can be rewritten to standard form and point-slope form.

### Evidence of Learning

**Formative Assessments:** A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, Kahoot, Quizizz, IXL, independent practice, activities, questioning and discussions

**Summative Assessments:** Unit 4 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 8 classes with flexibility for each teacher to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

**Alternative Assessment: Tying Knots Project** (Big Ideas Blue Book , Chapter 4 resource)

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLs)	Pacing
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<p>Understand that lines represent solutions of linear equations</p> <p>Graph linear equations</p> <p>Calculate the slope of a line</p> <p>Classify parallel and perpendicular lines by their slope</p>	<p><u>Content:</u> linear equation, solution of a linear equation, slope, rise, run, parallel and perpendicular lines</p> <p><u>Skills:</u> Represent solutions to a linear equation by making a table of values.</p> <p>Plot ordered pairs</p> <p>Graph horizontal and vertical lines</p> <p>Describe the slope of a line as positive, negative, zero, or no slope</p> <p>Find the slope of horizontal and vertical lines</p> <p>Find the slope from two points</p> <p>Find the slope from a table</p> <p>Recognize that parallel lines have the same slope</p> <p>Recognize that perpendicular lines have negative reciprocal slopes</p> <p>Use similar triangles to explain why the slope is the same between any two points on a line</p>	<p>Do Now</p> <p>Exit Tickets</p> <p><a href="#">Anatomy of a Hurricane</a></p> <p>Homework Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p>Quiz created by teacher</p>	<p>8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.</p> <p>8.EE.6 Use similar triangles to explain why the slope <math>m</math> is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation <math>y=mx</math> for a line through the origin and the equation <math>y=mx+b</math> for a line intercepting the vertical axis at <math>b</math>.</p> <p>MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.</p>	5 Days
<p>Graph proportional relationships</p> <p>Identify slopes and y-intercepts</p> <p>Graph linear equations written in slope-intercept form</p> <p>Graph linear equations written in standard form</p>	<p><u>Content:</u> proportional relationships, x-intercept, y-intercept, slope-intercept form, standard form.</p> <p><u>Skills:</u> Tell whether <math>x</math> and <math>y</math> are proportional</p> <p>Analyze proportional relationships to find the slope and y-intercept</p> <p>Write an equation that represents a real-life situation</p> <p>Graph proportional relationships</p> <p>Interpret and compare graphs and equations</p> <p>Identify the slope and y-intercept from an equation</p> <p>Use a graphing calculator to graph relationships</p>	<p>Do Now</p> <p>Exit Tickets</p> <p>Homework Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p>Quiz created by teacher</p> <p><a href="#">Slope Intercept Form</a> <a href="#">Stained Glass Window Project</a></p>	<p>8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.</p> <p>8.1.8.F.1 Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision.</p>	7 Days

	<p>Calculate the x- and y-intercepts from an equation</p> <p>Rewrite standard form to slope-intercept form</p> <p>Interpret the slope and y-intercept in real-life applications</p> <p>Identify the x- and y-components in a real-life situation</p>			
<p>Construct equations in slope intercept form</p> <p>Construct Equations in Point-Slope Form</p>	<p><u>Content:</u> Slope-intercept form, point-slope form, parallel and perpendicular lines.</p> <p><u>Skills:</u> Write equations in slope intercept form using given points, graphs, and real world situations.</p> <p>Form an equation using the slope and a point on a line.</p> <p>Identify equations of parallel and perpendicular lines.</p> <p>Identify the slope and y-intercept from a graph</p> <p>Write equations that represent real-life situations</p> <p>Use point-slope form to write equations</p> <p>Write an equation in slope-point form when given two points</p> <p>Rewrite point-slope form to <math>y=mx+b</math> form</p>	<p>Do Now</p> <p>Exit Tickets</p> <p>Homework Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p>Unit Summative Assessment created by teacher</p>	<p>8.F.4 Construct a function to model a linear relationships 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 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 table of values.</p>	6 Days

## Unit 5 Linear Functions Overview

Unit Title: Linear Functions

**Unit Summary:** This unit will begin with the class learning how a relation can be considered a function. The various ways that functions can be displayed will be explored, and connections between linear functions and linear equations will be made. Students will analyze the characteristics of functions to determine whether the function is linear or nonlinear. The class will use different phrases to describe how a function is changing over time in a real world scenario.

**Suggested Pacing:** 14 days (11 days for instruction, 3 days for review/assessment)

### Learning Targets

**Unit Essential Questions:**

- How can functions be represented?
- How can you recognize when a pattern in real life is linear or nonlinear?
- How can you use a graph to represent relationships between quantities without using numbers?

**Unit Enduring Understandings:**

- A relation is a function if each input has exactly one output.
- Mapping diagrams, equations, tables, and graphs can each be used to represent functions.
- Graphing a function helps you to see the relationship between  $x$  and  $y$ .
- A linear function has a constant rate of change, while a nonlinear function does not.
- Graphs without numbers can show increasing, decreasing, and constant rates.

### Evidence of Learning

**Formative Assessments:** A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, Kahoot, Quizizz, IXL, independent practice, activities, questioning and discussions

**Summative Assessments:** Unit 5 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 8 classes with flexibility for each teacher to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

**Alternative Assessment: Basketball Accuracy Project** (Big Ideas Blue Book , Chapter 6 resource)

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLS)	Pacing
Define relations and functions.  Determine whether relations are functions.	<u>Content:</u> input, output, relation, mapping diagram, function, function rule, linear function, nonlinear function.	Do Now  Exit Tickets  Homework Results: Textbook problems, section	8.F.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.	6 Days

<p>Describe patterns in mapping diagrams.</p> <p>Write function rules.</p> <p>Use input –output tables to represent functions.</p> <p>Use graphs to represent functions.</p> <p>Understand the equation <math>y=mx+b</math> defines a linear function.</p> <p>Write linear functions using graphs or tables.</p>	<p><b>Skills:</b> Understand the definition of a function</p> <p>Complete input-output tables</p> <p>List ordered pairs of a relation</p> <p>Identify the number of outputs for each input</p> <p>Draw a mapping diagram from a graph of points</p> <p>Evaluate a function when given a value for x or y</p> <p>Write an equation that describes a function</p> <p>Graph functions</p> <p>Identify what the x- and y-variables represent</p> <p>Interpret the slope and y-intercept</p>	<p>worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p>Quiz created by teacher</p> <p><a href="#">Heat Index</a></p>	<p>8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions.)</p> <p>8.F.3 Interpret the equation <math>y=mx+b</math> as defining a linear function, whose graph is a straight line; give examples of functions that are not linear..</p> <p>8.F.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 graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of is graph or a table of values.</p> <p>MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.</p>	
<p>Compare linear functions.</p> <p>Identify linear and nonlinear functions from a table, graph, or equation.</p> <p>Compare linear and nonlinear functions</p> <p>Analyze the relationship between two quantities using graphs.</p> <p>Sketch graphs to represent the relationship between two quantities.</p>	<p><b>Content:</b> nonlinear function, analyzing functions</p> <p>Identify the rate of change as constant or not constant</p> <p>Rewrite equations to see if they can be written in slope-intercept form</p> <p>Compare steepness of a graph</p> <p>Describe and interpret graphs</p> <p>Make comparisons between graphs</p>	<p><a href="#">Sketching Graphs of Functions Telephone Game</a></p> <p>Do Now</p> <p>Exit Tickets</p> <p>Homework Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p>Quiz created by teacher</p>	<p>8.F.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> <p>NJSLSA.L6. Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.</p>	5 Days

## Unit 6 Systems of Equations

Unit Title: Systems of Equations

**Unit Summary:** In this Unit students will be utilizing their learned skills on graphing and solving linear equations in order to find a point of intersection between two graphs. Students will explore the different methods of solving systems of linear equations with two variables, and analyze characteristics of the equations to determine which method is most appropriate. The unit will be filled with opportunities for students to apply systems of equations to real world scenarios.

**Suggested Pacing:** 13 days (10 days for instruction, 3 days for review/assessment)

### Learning Targets

**Unit Essential Questions:**

- What applications require solving simultaneous linear equations?
- When can a system of linear equations have one solution? No solution? Many solutions?

**Unit Enduring Understandings:**

- The solution to systems of equations is the point of intersection.
- Systems of equations can be solved by graphing, substitution, and elimination.
- Intersecting lines have one solution.
- Parallel lines have no solution; they have the same slope.
- The same lines have infinitely many solutions; they have the same slope and y-intercept.

### Evidence of Learning

**Formative Assessments:** A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, Kahoot, Quizizz, IXL, independent practice, activities, questioning and discussions

**Summative Assessments:** Unit 6 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 8 classes with flexibility for each teacher to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLS)	Pacing
<p>Write and solve systems of linear equations by graphing, substitution, and elimination.</p> <p>Solve systems of equations with no solution or infinitely many solutions.</p> <p>Solve real-life problems that require two equations to be set up and solved to find a solution</p>	<p><u>Content:</u> like terms, expression, simplifying an expression, properties of addition and multiplication, coefficient, equation, multi-step equation, checking a solution, system of equations, solution to a system of equations</p> <p><u>Skills:</u> Solve multi-step equations.</p>	<p>Do Now</p> <p>Exit Tickets</p> <p><a href="#">Cross Discipline Project</a></p> <p><a href="#">Mixing Alloys</a></p> <p>Homework Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative</p>	<p>8.EE.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.8b Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.</p>	10 Days

	<p>Understand that the solution of a system of two linear equations in two variables corresponds to the point of intersection of their graphs.</p> <p>Solve systems of two linear equations in two variables graphically and algebraically.</p> <p>Solve real-world mathematical problems leading to systems of two linear equations in two variables.</p> <p>Rewrite equations to solve for one variable, and use substitution to solve for the other variable</p> <p>Multiply equations in order to create a pair of like terms that have opposite coefficients</p> <p>Identify parallel lines (same slope, different y-intercepts) as having no solution</p> <p>Recognize that same lines (same slope, same y-intercept) have infinitely many solutions.</p>	<p>Assessments: Kahoot, Quizizz, IXL</p> <p>Quiz created by teacher</p> <p>Summative Assessment created by teacher</p>	<p>8.EE.8c Solve real-world and mathematical problems leading to two linear equations in two variables.</p> <p>9.1.8.E.6 Compare the value of goods or services from different sellers when purchasing large quantities and small quantities.</p> <p>MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.</p> <p>8.1.8.F.1 Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision.</p>	
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## Unit 7 Data Analysis & Displays

Unit Title: Data Analysis & Displays

**Unit Summary:** In this Unit students will be collecting data, and displaying the results in scatter plots and two way tables. The data displays will be analyzed, and inferences will be made about future outcomes based on the results. The unit will conclude with students deciding which data display is most appropriate for a given situation.

**Suggested Pacing:** 13 days (10 days for instruction, 3 days for review/assessment)

### Learning Targets

**Unit Essential Questions:**

- How can you display data in a way that helps you make decisions?
- How can you use data to predict an event?
- When is a scatterplot used to determine if there is an association between two quantities?
- When is a two-way table used to determine if there is an association between two variables?

**Unit Enduring Understandings:**

- A scatter plot is a graph that shows the relationship between two data sets as positive, negative, nonlinear, or no relationship.
- A line of fit can be used to predict an event.
- Patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table.
- Marginal frequencies are used to interpret data in a two-way table.
- Various data displays can be used to appropriately represent data, or to be misleading.

### Evidence of Learning

**Formative Assessments:** A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, Kahoot, Quizizz, IXL, independent practice, activities, questioning and discussions

**Summative Assessments:** Unit 7 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 8 classes with flexibility for each teacher to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLS)	Pacing
Construct and interpret scatter plots.  Describe patterns in scatter plots.  Find lines of fit.  Use lines of fit to solve	<u>Content:</u> coordinate plane, quadrant, ordered pair, slope-intercept form, scatter plots, line of fit, line of best fit.  <u>Skills:</u> Construct and interpret	Do Now  Exit Tickets  Homework Results: Textbook problems, section worksheets, and puzzles.  Online Formative	8.SP.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 or nonlinear association.  8.SP.2 Know that straight lines are widely	6 Days

problems.	<p>scatter plots.</p> <p>Find and assess lines of fit for scatter plots.</p> <p>Use equations of lines to solve problems and interpret the slope and the y-intercept.</p> <p>Describe relationship between the x- and y-variables</p>	<p>Assessments: Kahoot, Quizizz, IXL</p> <p>Quiz created by teacher</p> <p><a href="#">How Tall: Line of Best Fit Project</a></p>	<p>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.</p> <p>8.SP.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.</p> <p>8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results</p> <p>NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.</p> <p>8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results</p>	
<p>Read two-way tables</p> <p>Make and interpret two-way tables.</p> <p>Choose appropriate data displays.</p> <p>Identify and analyze misleading data displays.</p>	<p><u>Content:</u> two-way table, joint frequency, marginal frequency, various data displays.</p> <p><u>Skills:</u> Use two-way tables.</p> <p>Complete totals for rows and columns</p> <p>Find marginal frequencies</p> <p>Interpret marginal frequencies</p> <p>Find percentages to interpret two-way tables</p> <p>Choose appropriate data displays.</p> <p>Choose data displays based on how they represent data</p>	<p>Do Now</p> <p>Exit Tickets</p> <p>Homework Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p><a href="#">Two Way Table Project</a></p> <p><a href="#">Misleading Data Activity</a></p> <p>Summative Assessment created by teacher</p>	<p>8.SP.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.</p> <p>8.SP.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 or nonlinear association.</p> <p>8.1.P.A.5 Demonstrate the ability to access and use resources on a computing device.</p> <p>9.1.8.E.8 Recognize the techniques and effects of deceptive advertising.</p> <p>CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem.</p>	4 Days

## Unit 8 Transformations

Unit Title: Transformations

**Unit Summary:** In this Unit students will explore transforming polygons in a coordinate plane, and analyzing the change that the transformation has on the location, orientation, and size of the shape. Students will inspect transformations that have occurred, and describe the series of events that have created the transformed shape from the original. Dilations and scale factor will show us the relationship between similar figures, and the ratios that are created with the perimeter and area of similar figures.

**Suggested Pacing:** 19 days (16 days for instruction, 3 days for review/assessment)

### Learning Targets

**Unit Essential Questions:**

- Why does one need to perform transformations on figures?
- How does knowing two figures are congruent or similar help one to solve problems?
- How do changes in dimensions of similar geometric figures affect the perimeter and areas of the figures?

**Unit Enduring Understandings:**

- Figures can be translated, reflected, and rotated in a plane.
- Figures can be reduced or enlarged using a scale factor.
- The perimeter of similar figures is multiplied by the scale factor.
- The area of similar figures is multiplied by the square of the scale factor.

### Evidence of Learning

**Formative Assessments:** A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, Kahoot, Quizizz, IXL, independent practice, activities, questioning and discussions

**Summative Assessments:** Unit 8 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 8 classes with flexibility for each teacher to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

**Alternative Assessment: Analyzing Stride Length Project** (Big Ideas Blue Book , Chapter 2 resource)

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLs)	Pacing
Name corresponding angles and sides of corresponding figures.  Identify translations, reflections, and rotations.	<u>Content:</u> coordinate plane, ordered pair, x-axis, y-axis, x-coordinate, y-coordinate, opposite, polygon, quadrilateral, triangle,	Do Now  Exit Tickets  Classwork and Homework Results: Textbook	8.G.1 Verify experimentally the properties of translations, reflections, rotations, and dilations.  8.G.2 Understand that a two-dimensional figure is congruent to another if the	10 Days

<p>Translate, reflect, and rotate figures in the coordinate plane.</p> <p>Use more than one transformation to find images of figures.</p>	<p>vertices, congruent figures, corresponding angles, corresponding sides, transformation, image, translation, reflection, line of reflection, rotation, center of rotation, angle of rotation</p> <p><u>Skills:</u> Verify the properties of translations, reflections, and rotations.</p> <p>Describe translations, reflections, rotations, and dilations using coordinates.</p> <p>Understand that figures are congruent (or similar) when they can be related by a sequence of translations, reflections, and rotations (and dilations).</p> <p>Describe a sequence that exhibits congruence or similarity between two figures</p> <p>Use notation for angles and sides</p> <p>Tell whether a figure is a translation of another figure</p> <p>Identify the line of reflection</p> <p>Tell whether a figure is a reflection of another figure</p> <p>Rotate figures <math>90^\circ</math> or <math>180^\circ</math> clockwise and counterclockwise</p> <p>Tell whether a figure is a rotation of another figure</p>	<p>problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p><a href="#">Polygraph: Transformations</a></p> <p><a href="#">Desmos: Rotations</a></p> <p>Quiz created by teacher</p>	<p>second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. .</p> <p>8.G.3 Describe the effect of translations, reflections, and rotations on two-dimensional figures using coordinates.</p> <p>8.1.P.A.5 Demonstrate the ability to access and use resources on a computing device.</p> <p>SMP8 Look for and express regularity in repeated reasoning.</p>	
<p>Name corresponding angles and sides of similar figures.</p> <p>Understand the relationship between perimeters of similar figures.</p> <p>Understand the relationship between areas of similar figures.</p> <p>Find ratios of perimeters and areas for similar figures. Identify dilations.</p> <p>Dilate figures in the coordinate plane.</p>	<p><u>Content:</u> ratios, proportions, similar figures, perimeter, area, dilations, center of dilation, scale factors</p> <p><u>Skills:</u> Understand that figures are congruent (or similar) when they can be related by a sequence of translations, reflections, and rotations (and dilations).</p> <p>Describe a sequence that exhibits congruence or similarity between two figures</p>	<p>Do Now</p> <p>Exit Tickets</p> <p>Classwork and Homework Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p><a href="#">Dilations Activity Sheet</a></p> <p>Summative Assessment created by teacher</p>	<p>8.G.3 Describe the effect of dilations on two-dimensional figures using coordinates.</p> <p>8.G.4 Understand that a two-dimensional figure is similar to another if he second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.</p> <p>8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.</p>	6 Days

Use more than one transformation to find images of figures.	<p>Determine whether dimensions are proportional</p> <p>Identify similar figures</p> <p>Find side lengths of similar figures using proportions</p> <p>Use proportions to find the ratio of perimeters</p> <p>Square proportions to find the ratio of areas</p> <p>Use scale factor to dilate images</p> <p>Tell whether a figure is a dilation of another figure</p> <p>Name the coordinates of an image</p>			
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## Unit 9 Angles & Triangles

Unit Title: Angles & Triangles

Unit Summary:

In this Unit Students will build upon their knowledge of parallel lines, and explore the relationship of the angles created when a transversal cuts through the lines. Students will work with triangles to learn the properties of their angles, focusing on exterior angles and using Algebra to find missing values. Interior and exterior angles of Polygons will be calculated by using the number of sides, angles, and given formulas to find missing values.

Suggested Pacing: 14 days (11 days for instruction, 3 days for review/assessment)

### Learning Targets

Unit Essential Questions:

- How can you describe angles formed by parallel lines and transversals?
- How can you describe the relationships among the angles of triangles?
- How can you find the sum of the interior and exterior angles of polygons?
- How does knowing two figures are congruent or similar help one to solve problems?

Unit Enduring Understandings:

- Parallel lines and a transversal form eight corresponding angles that are supplementary or congruent.
- The sum of a triangle's interior angles is 180 degrees. The measure of a triangle's exterior angle is equal to the sum of the two remote interior angles.
- The sum of a polygon's interior angles can be found using the formula  $(n-2)180$ . The sum of any polygon's exterior angles is 360.
- Triangles are similar when two angles of one triangle are congruent to two angles of the other triangle.

### Evidence of Learning

**Formative Assessments:** A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, Kahoot, Quizizz, IXL, independent practice, activities, questioning and discussions

**Summative Assessments:** Unit 9 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 8 classes with flexibility for each teacher to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLS)	Pacing
Identify the angles formed when parallel lines are cut by a transversal.	<u>Content:</u> adjacent angles, vertical angles, congruent angles, complementary angles,	Do Now  Exit Tickets	8.G.5 Use informal arguments to establish facts about the angle sum and exterior angles of triangles, about the angles created when parallel lines are cut by a	11 days

<p>Find the measures of angles formed when parallel lines are cut by a transversal.</p> <p>Understand that the sum of the interior angle measures of a triangle is <math>180^\circ</math>.</p> <p>Find the measures of interior and exterior angles of triangles.</p> <p>Find the sum of interior angle measures of polygons.</p> <p>Understand that the sum of the exterior angles of polygons is <math>360^\circ</math>.</p> <p>Find the measures of interior and exterior angles of polygons.</p> <p>Understand the concept of similar triangles.</p> <p>Identify similar triangles.</p> <p>Use indirect measurement to find missing measures.</p>	<p>supplementary angles, transversal, interior angles, exterior angles, interior angles of a polygon, exterior angles of a polygon, convex polygon, concave polygon, regular polygon, indirect measurement</p> <p><u>Skills:</u> Classify and determine the measures of angles created when parallel lines are cut by a transversal.</p> <p>Demonstrate that the sum of the interior angle measures of a triangle is <math>180^\circ</math> and apply this fact to find the unknown measures of angles and the sum of the angles of polygons.</p> <p>Use similar triangles to solve problems that include height and distance.</p> <p>Identify corresponding, supplementary, vertical, alternate interior and exterior angles</p> <p>Write equations to find the measure of interior and exterior angles</p> <p>Utilize a formula to find the measures of interior angles of polygons.</p> <p>Write an equation to find the measure of exterior angles of polygons</p> <p>Use proportions to find indirect measurement.</p> <p>Calculate ratios of corresponding sides</p>	<p>Classwork and Homework Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p><a href="#">City Planning Project</a></p> <p><a href="#">Angles of Polygons-Turtle Shell</a></p> <p>Quiz created by teacher</p> <p>Summative Assessment created by teacher</p>	<p>transversal, and the angle-angle criterion for similarity of triangles.</p> <p>CRP2. Apply appropriate academic and technical skills.</p> <p>Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation</p> <p>SMP4 Model with mathematics.</p>	
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## Unit 10 Volumes & Similar Solids

Unit Title: Volumes & Similar Solids

**Unit Summary:** In this Unit students will calculate the volume of three dimensional shapes such as cylinders, cones, and spheres. The class will explore methods of finding other missing dimensions, by rearranging formulas, and solving for the desired variable. The class will use their knowledge about dilations from Unit 8 to calculate the surface area and volume of similar solids.

**Suggested Pacing:** 12 days (9 days for instruction, 3 days for review/assessment)

### Learning Targets

**Unit Essential Questions:**

- How can one use volume to solve real-world and mathematical problems?
- What is the relationship, if any, between volume of cones, cylinders, and spheres?
- When the dimensions of a solid increase by a factor of  $k$ , how does the surface area change? How does the volume change?

**Unit Enduring Understandings:**

- The volume of a cylinder is the area of its base times the height.
- The volume of a cone is  $\frac{1}{3}$  the area of its base times the height.
- The area of a sphere is  $4/3 \pi r^3$
- When the dimensions of a solid are increased by a scale factor, the surface area increases by a scale factor of  $k^2$
- When the dimensions of a solid are increased by a scale factor, the volume increases by a scale factor of  $k^3$

### Evidence of Learning

**Formative Assessments:** A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, Kahoot, Quizizz, IXL, independent practice, activities, questioning and discussions

**Summative Assessments:** Unit 10 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 8 classes with flexibility for each teacher to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLs)	Pacing
Find the volumes of cylinders, cones and spheres.	<u>Content:</u> area, composite figures, pi, radius, diameter, cone, cylinder, sphere, hemisphere, volume	Do Now  Exit Tickets	8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world mathematical problems.	6 Days
Find the height of spheres when given the volume.	<u>Skills:</u> Know and apply the formulas for the volumes of cones, cylinders, and	Classwork and Homework Results: Textbook problems, section worksheets, and puzzles.	NJSLSA.SL4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization,	
Utilize formulas for three dimensional shapes to find dimensions in real-life		Online Formative		



<p>situations.</p>	<p>spheres</p> <p>Use unit of measurement</p> <p>Identify the base, height, slant height, radius, and diameter of 3D figures</p>	<p>Assessments: Kahoot, Quizizz, IXL</p> <p><a href="#">Volume-Packaging Salsa</a></p>	<p>development, and style are appropriate to task, purpose, and audience.</p>	
<p>Identify similar solids.</p> <p>Use properties of similar solids to find missing measures.</p> <p>Understand the relationship between volumes of similar solids.</p> <p>Utilize formulas for three dimensional shapes to find dimensions in real-life situations.</p>	<p><u>Content:</u> surface area, volume, similar shapes</p> <p><u>Skills:</u> Describe a sequence that exhibits similarity between two figures.</p> <p>Use ratios to determine if figures are similar</p> <p>Use ratios of similar figures to find missing measures</p>	<p>Do Now</p> <p>Exit Tickets</p> <p>Classwork and Homework</p> <p>Results: Textbook problems, section worksheets, and puzzles.</p> <p>Online Formative Assessments: Kahoot, Quizizz, IXL</p> <p>Summative Assessment created by teacher.</p>	<p>8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world mathematical problems.</p> <p>NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.</p>	<p>3 Days</p>