

Special Services - Math - 8th Grade

Unit Title: Unit 1: Review Material and Equations in One and Two Variables (32 Days)

Stage 1: Desired Results

Standards & Indicators:

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 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 collecting like terms.

8.EE.B.5: Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

8.EE.B.6: Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .

8.F.A.2: Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

8.F.B.4: Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x,y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

8.F.A.3: Interpret the equation $y=mx+b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.

8.EE.C.8: Analyze and solve pairs of simultaneous linear equations.

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.

8.EE.C.8b Solve systems of two linear equations in two variables using the substitution method and estimate solutions by graphing the equations. Solve simple cases by inspection. **For example: by inspection, conclude that $3x+2y=5$ and $3x+2y=6$ have no solution because $3x+2y$ cannot simultaneously be 5 and 6. Solve $3x+y=30$ and $y=2x$ using the substitution method**

8.EE.C.8c: Solve real-world and mathematical problems leading to two linear equations in two variables.

Dynamic Learning Map Essential Elements/New Jersey Student Learning Standards:

EE.8.EE.5–6. Graph a simple ratio by connecting the origin to a point representing the ratio in the form of y/x . For example, when given a ratio in standard form $(2:1)$, convert to $2/1$, and plot the point $(1,2)$.

Special Services - Math - 8th Grade

EE.8.EE.7. Solve simple algebraic equations with one variable using addition and subtraction. EE.8.F.1–3. Given a function table containing at least 2 complete ordered pairs, identify a missing number that completes another ordered pair (limited to linear functions). EE.8.F.4. Determine the values or rule of a function using a graph or a table.		
Career Readiness, Life Literacies and Key Skills		
Standard	Performance Expectations	Core Ideas
9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option	Multiple solutions often exist to solve a problem.
9.4.8.TL.2	Gather data and digitally represent information to communicate a real-world problem	Some digital tools are appropriate for gathering, organizing, analyzing, and presenting information, while other types of digital tools are appropriate for creating text, visualizations, models, and communicating with others.
9.4.8.TL.3	Select appropriate tools to organize and present information digitally	
9.4.8.TL.5	Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.	Digital tools allow for remote collaboration and rapid sharing of ideas unrestricted by geographic location or time.
Central Idea/Enduring Understanding: Solving equations involves various steps. Students must be able to break down problems into manageable parts to solve. Breaking down problems is a valuable skill within real life situations as well. Functions are another element that can be used in everyday life. Functions can be used to determine how much money you earn through working. It can be used to determine the cheapest phone plan or even how long a car trip will take.		Essential/Guiding Question: What are inverse operations? How do you use inverse operations to help solve equations? How can you use the work backward problem-solving strategy to an equation? How can you compare decimals? How can you use a table to determine if there is a proportional relationship between two quantities? How can you find the rule used in a function table? How can you find the unknown input or output of a table given a certain rule?
Content: - Integers Skills - Operations with Integers - Fraction and Decimal Operations - Solving Equations - Graph simple ratio - Introduction to Functions - In-Out Tables - Function Tables		Skills(Objectives): Identify and setup ratios Identify the inverse operations Add integers with the same and different signs Subtract Integers with the same and different signs Multiply integers with same and different signs Divide integers with same and different signs Solve equations with rational coefficients Identify proportional and nonproportional linear relationships by finding a constant rate of change. Determine the input and output of a table given a rule Find the given rule when given a completed function table.

Special Services - Math - 8th Grade

Interdisciplinary Connections:

Make sense of problems and persevere in solving them
Reason abstractly and quantitatively
Model with mathematics
Use appropriate tools strategically
Attend to precision
Look for and make use of structure
Look for and express regularity in repeated reasoning

Stage 2: Assessment Evidence

Performance Task(s):

Performance Task 1: Operations with Integers

- Students will distinguish between positive and negative integers on a number line.
- Students will use the number line and knowledge of integers to perform all the operations with integers.
- Students will review the operations with integers.

Performance Task 2: Algebraic Expressions

- Students will identify the key elements of an algebraic expression.
- Students will highlight the operation used, then determine the inverse operation needed to solve the problem.
- Students will evaluate equations.

Performance Task 3: Functions

- Students will begin to understand the difference between the input and output of function tables
- Students will identify the pattern used in different function tables.
- Students will be able to use the pattern identified to help them complete function tables.

Other Evidence:

Teacher created materials
Written and online assignments
Glencoe Math Review Sheets
Exit Tickets
Cornell Notes
Teacher created quizzes/tests
Modified CFA
Observations
Projects
Class Discussions

Stage 3: Learning Plan

Learning Opportunities/Strategies:

Operations with Integers:

- Students will use an interactive notebook on google classroom.
- Students will complete foldables.

Resources:

LGBT and Disabilities Law
[Inclusive Math Class](#)
[GLSEN Educator Resources](#)

Special Services - Math - 8th Grade

- Students will complete and review worksheets. Students will play games involving operations with integers. <u>Algebraic Expressions:</u> - Students will use a google slides interactive notebook to identify key parts of an algebraic expression. - Students will also use google slides to balance equations. Students will be able to move manipulatives to each side of the balance to visually represent the equation. - Students will use Glencoe Math review sheets to practice solving equations. <u>Introduction to Functions:</u> - Students will complete an interactive notebook that focuses on all aspects of functions. - Students will identify the key parts of a function. - Students will complete a sorting activity about what is a function and what is not a function. - Students will evaluate functions. Students will be given a function, then they will have to set inputs to determine their outputs. - Students will complete problems involving real life examples using functions. Students will be given everyday situations where they will have to use functions to find the solution	Google Classroom Google Slides Google Sheets and Forms Glencoe Math Instructional Videos TeachersPayTeachers STEM activities Teacher created materials Kahoot Khan Academy GimKit BrainPop EdPuzzle Flocabulary MathTV IXL Visual Manipulatives App Desmos Blooket ALEKS
---	---

Differentiation *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Khan Academy Project based learning Challenging problems with higher degree of difficulty Higher order thinking questions Differentiation of pacing and activities	Tutoring Tables Graphic organizers Differentiation of learning strategies: visual, auditory, kinetic and cooperative Technology	Provide a highly structured, predictable learning environment Provide organizers/study guides Lessons designed to the style of	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual,

Special Services - Math - 8th Grade

Differentiation of learning strategies: visual, auditory, kinetic and cooperative Enrichment and extension Technology connection Practice assignments	connection Practice Assignments Puzzle time activities Record and practice journal Differentiating the lesson activities Lesson tutorials Skills review handbook	learning that matches the student Cooperative Learning Positive reinforcement Announce test with adequate prep time Lessons presentation available on google classroom Frequent check for understanding Break down task into manageable units One-on-one instruction Tutoring Pair student with a high achieving student	kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries
---	--	---	---

Unit Title: Unit 2: Linear Equations and Linear/Nonlinear Functions (32 Days)

Stage 1: Desired Results

Standards & Indicators:

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; derive the equation $y=mx$ for a line through the origin and the equation $y=mx+b$ for a line intercepting the vertical axis at b .

8.F.A.3: Interpret the equation $y=mx+b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.

8.F.B.4: Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x,y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

8.EE.C.8c: Solve real-world and mathematical problems leading to two linear equations in two variables.

8.EE.C.8: Analyze and solve pairs of simultaneous linear equations.

Special Services - Math - 8th Grade

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.

8.EE.C.8b: Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.

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.

8.F.A.2: Compare properties (e.g. rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

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.

Dynamic Learning Map Essential Elements/New Jersey Student Learning Standards:

EE.8.EE.5–6. Graph a simple ratio by connecting the origin to a point representing the ratio in the form of y/x . For example, when given a ratio in standard form (2:1), convert to $2/1$, and plot the point (1,2).

EE.8.F.1–3. Given a function table containing at least 2 complete ordered pairs, identify a missing number that completes another ordered pair (limited to linear functions).

EE.8.F.4. Determine the values or rule of a function using a graph or a table.

EE.8.F.5. Describe how a graph represents a relationship between two quantities.

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.1.8.CP.1	Compare prices for the same goods or services	There are strategies to build and maintain a good credit history.
9.1.8.CP.5	Compare the financial products and services available to borrowers relative to their credit worthiness.	Credit history affects personal finances.
9.1.8.FI.2	Determine the most appropriate use of various financial products and services to borrow and access money for making purchases (e.g., ATM, debit cards, credit cards, check books, online/mobile banking)	There are a variety of factors that influence how well suited a financial institution and/or service will be in meeting an individual's financial needs.
9.4.8.TL.5	Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.	Digital tools allow for remote collaboration and rapid sharing of ideas unrestricted by geographic location or time.

Central Idea/Enduring Understanding:

Linear equations and functions are used throughout everyday life. They can be used to determine income over time or to calculate mileage rates. These processes allow

Essential/Guiding Question:

How can you find and use patterns to model real-world situations?
How can we model relationships between quantities?
What does the variable represent?

Special Services - Math - 8th Grade

students to break down larger abstract concepts into more manageable parts, which is an essential skill.	What pattern is being used in the function table? How can you write a function to represent the situation? How does the domain affect the range in a function? How can functions be used to solve real-world situations? What is the difference between linear and nonlinear functions? How can you determine if a function is linear or nonlinear?
Content: • Linear Equation • Lines • Plotting Points • Domain (Input) • Range (Output) • Function Tables • Independent/Dependant Variables • Collecting Data • Graphing a Function • Writing Functions • Nonlinear Functions	Skills(Objectives): Organize the relation into a table and a graph Examine the input and the output of a function Compare and contrast the input and output of a function Analyze the function table to determine the pattern being used Use different tools to collect data Interpret the data into a graph Create a function using real world problems Compare and contrast linear and nonlinear functions Identify the ways to tell if a function is nonlinear

Interdisciplinary Connections:

Make sense of problems and persevere in solving them
Reason abstractly and quantitatively
Model with mathematics
Use appropriate tools strategically
Attend to precision
Look for and make use of structure
Look for and express regularity in repeated reasoning

Stage 2: Assessment Evidence

<u>Performance Task(s):</u> Performance Task 1: Functions • Students will review finding the pattern used in different function tables. • Students will be able to use the pattern identified to help them complete function tables. Performance Task 2: Linear Equations • Students will use linear equations to create a table with x and y values. • Students will plug in terms to determine the x or the y values • Students will use the tables to find coordinate pairs, then plot them on a graph	<u>Other Evidence:</u> Teacher created materials Written and online assignments Glencoe Math Review Sheets Exit Tickets Cornell Notes Teacher created quizzes/tests Modified CFA Observations Projects Class Discussions
--	--

Special Services - Math - 8th Grade

Performance Task 3: Linear Vs. Nonlinear - Students will be able to explain the difference between linear and nonlinear functions - Students will use strategies and rules to determine if a function is nonlinear	
Stage 3: Learning Plan	
<u>Learning Opportunities/Strategies:</u> <u>Review of Function Tables:</u> - Students will complete a sorting activity about what is a function and what is not a function. - Students will complete review problems involving real life examples using functions. Students will be given everyday situations where they will have to use functions to find the solution. <u>Linear Equations:</u> - Students will complete a foldable about two different methods for graphing linear equations. Students will look at making a table, as well as using slope-intercept form. - Students will complete foldables related to graphing various linear equations. - Students will use review worksheets to practice the methods. - Students will complete a graphing linear equations choice board. The students will choose three in a row to complete. All the situations will be something they might see in their everyday lives. <u>Linear vs. Nonlinear:</u> - Students will complete guided notes about the rules that will make a function nonlinear. - Students will use a flow chart of answers to questions they should ask themselves to go through if it is linear or nonlinear.	<u>Resources:</u> LGBT and Disabilities Law Inclusive Math Class GLSEN Educator Resources Google Classroom Google Slides Google Sheets and Forms Glencoe Math Instructional Videos TeachersPayTeachers STEM activities Teacher created materials Kahoot Khan Academy GimKit BrainPop EdPuzzle Flocabulary MathTV IXL Visual Manipulatives App Desmos Blooket ALEKS

Special Services - Math - 8th Grade

Students will go through these steps to help them with task cards, as well as other review worksheets to determine if functions are linear or nonlinear.			
Differentiation *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation			
High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Khan Academy Project based learning Challenging problems with higher degree of difficulty Higher order thinking questions Differentiation of pacing and activities Differentiation of learning strategies: visual, auditory, kinetic and cooperative Enrichment and extension Technology connection Practice assignments	Tutoring Tables Graphic organizers Differentiation of learning strategies: visual, auditory, kinetic and cooperative Technology connection Practice Assignments Puzzle time activities Record and practice journal Differentiating the lesson activities Lesson tutorials Skills review handbook	Provide a highly structured, predictable learning environment Provide organizers/study guides Lessons designed to the style of learning that matches the student Cooperative Learning Positive reinforcement Announce test with adequate prep time Lessons presentation available on google classroom Frequent check for understanding Break down task into manageable units One-on-one instruction Tutoring Pair student with a high achieving student	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

Special Services - Math - 8th Grade

Unit Title: Unit 3: Exponents, Triangles, and Transformations (52 Days)

Stage 1: Desired Results

Standards & Indicators:

8.EE.A.1: Know and apply the properties of integer exponents to generate equivalent numerical expressions.

8.EE.A.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^2 = p$, where p is a positive rational number.

8.EE.A.2a Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational

8.EE.A.2b Simplify numerical radicals, limiting to square roots (i.e. nonperfect squares). For example, simplify $\sqrt{8}$ to $2\sqrt{2}$.

8.NS.A.1: Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

8.NS.A.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.

8.NS.A.3 Understand that the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational

8.G.A.5: Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

8.G.B.6: Explain a proof of the Pythagorean Theorem and its converse.

8.G.B.7: Apply the Pythagorean Theorem to determine unknown-side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

8.G.B.8: Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

8.G.A.1: Verify experimentally the properties of rotations, reflections, and translations.

8.G.A.3: Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

Dynamic Learning Map Essential Elements/New Jersey Student Learning Standards:

EE.8.EE.1. Identify the meaning of an exponent (limited to exponents of 2 and 3).

EE.8.EE.2. Identify a geometric sequence of whole numbers with a whole number common ratio.

Special Services - Math - 8th Grade

EE.8.G.1. Recognize translations, rotations, and reflections of shapes. EE.8.G.2. Identify shapes that are congruent. EE.8.G.4. Identify similar shapes with and without rotation. EE.8.G.5. Compare any angle to a right angle, and describe the angle as greater than, less than, or congruent to a right angle. EE.8.NS.1. Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one. EE.8.NS.2.a. Express a fraction with a denominator of 100 as a decimal. EE.8.NS.2.b. Compare quantities represented as decimals in real-world examples to hundredths.		
Career Readiness, Life Literacies and Key Skills		
Standard	Performance Expectations	Core Ideas
9.4.8.IML.3	Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping	Digital tools make it possible to analyze and interpret data, including text, images, and sound. These tools allow for broad concepts and data to be more effectively communicated.
9.4.8.TL.2	Gather data and digitally represent information to communicate a real-world problem	Some digital tools are appropriate for gathering, organizing, analyzing, and presenting information, while other types of digital tools are appropriate for creating text, visualizations, models, and communicating with others.
9.4.8.TL.3	Select appropriate tools to organize and present information digitally.	
9.4.8.TL.5	Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.	
Central Idea/Enduring Understanding: Rational numbers are used in everyday life situations. Rational numbers can be used to compare prices of items, calculating interest, or even sharing a pizza. With geometry we move objects and images everyday. Transformations are used through the movement of aircrafts or even within graphic design. These aspects are essential in real life scenarios.		Essential/Guiding Question: How can mathematical ideas be represented? Why is it helpful to write numbers in different ways? How do you classify numbers into different categories? How can you use decimals to compare prices of different items in the real world? What are the elements of an exponent? How can algebraic concepts be applied to geometry? How do angles relate to each other? How can we best show or describe the change in position of a figure? What are the characteristics of the different transformations?
Content: • Rational Numbers • Repeating Decimals • Terminating Decimals		Skills(Objectives): Classify numbers as natural, whole, integers or rational Compare and contrast the different classifications of numbers

Special Services - Math - 8th Grade

• Comparing Decimals • Power • Base • Exponent • Perpendicular Lines/Parallel Lines • Acute Angles • Obtuse Angles • Right Angles • Transformations • Image • Translation • Reflection • Rotation • Dilation	Relate terminating and repeating decimals Use decimals to compare prices of items in real world scenarios Indicate the key parts of an exponent Define and explain the term 'exponent' Solve problems involving exponents to the second and third power Demonstrate the difference between the various types of angles Sketch acute, obtuse, and right angles Identify the characteristics of each transformation.
---	--

Interdisciplinary Connections:

Make sense of problems and persevere in solving them
Reason abstractly and quantitatively
Model with mathematics
Use appropriate tools strategically
Attend to precision
Look for and make use of structure
Look for and express regularity in repeated reasoning

Stage 2: Assessment Evidence

Performance Task(s):

Performance Task 1: Decimals and Fractions

- Students will classify numbers into categories based on attributes.
- Students will relate fractions and decimals and be able to switch fractions into decimals and vice versa
- Students will be able to use their knowledge of decimals to compare items in the real world

Performance Task 2: Exponents

- Students will identify all of the elements of an exponent
- Students will break down an exponent into exponential form and use that to help them solve problems
- Students will relate exponents to situations they see in the real world

Performance Task 3: Lines and Angles

- Students will draw parallel and perpendicular lines.

Other Evidence:

Teacher created materials
Written and online assignments
Glencoe Math Review Sheets
Exit Tickets
Cornell Notes
Teacher created quizzes/tests
Modified CFA
Observations
Projects
Class Discussions

Special Services - Math - 8th Grade

- Students will identify different lines in real world situations and explain the characteristics of that line.
- Students will describe the different attributes of acute, obtuse, and right angles
- Students will identify angles in real world situations.

Performance Task 4: Transformations

- Students will identify the difference between the transformations
- Students will translate, rotate, reflect, and dilate objects on a coordinate plane
- Students will use tables to assist them in transforming shapes

Stage 3: Learning Plan

Learning Opportunities/Strategies:

Decimals and Fractions:

- Students will complete a google slides interactive notebook.
- Students will go through the step by step process of switching a fraction to a decimal and a decimal to a fraction.
- Students will plan a dinner for their family. Students will be looking at various grocery circulars to compare prices for different items. Students will be given a template to follow, and the project will be modified in different ways for various groupings of students.

Exponents:

- Students will watch a video song about exponents.
- Students will do a hands on activity with cheez-its to represent the second power and cheese cubes to represent the third power.
- Students will use a foldable to break down the key parts of an exponent.
- Students will complete a google slides interactive notebook.

Resources:

LGBT and Disabilities Law

[Inclusive Math Class](#)

[GLSEN Educator Resources](#)

Google Classroom

Google Slides

Google Sheets and Forms

Glencoe Math

Instructional Videos

TeachersPayTeachers

STEM activities

Teacher created materials

Kahoot

Khan Academy

GimKit

BrainPop

EdPuzzle

Flocabulary

MathTV

IXL

Visual Manipulatives App

Desmos

Blooket

ALEKS

Special Services - Math - 8th Grade

- Students will complete and review worksheets from Glencoe Math.

Lines and Angles:

- Students will begin with a variety of hands on activities to explore different types of lines and angles, including using twizzlers to make parallel and perpendicular lines, as well as the various angles.
- Students will complete a google slides interactive notebook.
- Students will look at task cards with real life situations on it. The picture might be an angle used on a house or a position of an Olympic skater. They will use these real life situations to identify what angle is being represented and explain how they know.

Transformations:

- Students will complete a google slides interactive notebook. In the notebook will be guided notes on each transformation with some examples.
- Students will complete QR task cards identifying various transformations shown in pictures.
- Students will complete transformations with their own bodies as well as other objects around the classroom.
- Students will create transformations with animal crackers and trace it to represent the different ones.

Differentiation *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Khan Academy Project based learning Challenging problems with higher degree of difficulty Higher order thinking questions Differentiation of pacing and activities	Tutoring Tables Graphic organizers Differentiation of learning strategies: visual, auditory, kinetic and cooperative Technology	Provide a highly structured, predictable learning environment Provide organizers/study guides Lessons designed to the style of	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual,

Special Services - Math - 8th Grade

Differentiation of learning strategies: visual, auditory, kinetic and cooperative Enrichment and extension Technology connection Practice assignments	connection Practice Assignments Puzzle time activities Record and practice journal Differentiating the lesson activities Lesson tutorials Skills review handbook	learning that matches the student Cooperative Learning Positive reinforcement Announce test with adequate prep time Lessons presentation available on google classroom Frequent check for understanding Break down task into manageable units One-on-one instruction Tutoring Pair student with a high achieving student	kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries
--	--	---	---

Unit Title: Unit 4: Congruence & Similarity, Volume & Surface Area, Scatter Plots & Data Analysis, & Scientific Notation (52 Days)

Stage 1: Desired Results

Standards & Indicators:

8.G.A.1: Verify experimentally the properties of rotations, reflections, and translations.

8.G.A.1a: Lines are transformed to lines, and line segments to line segments of the same length.

8.G.A.1b: Angles are transformed to angles of the same measure.

8.G.A.2: Understand that a two-dimensional figure is congruent to another if the 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.

8.G.A.4: Understand that a two-dimensional figure is similar to another if the 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.

8.G.A.5: 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.

Special Services - Math - 8th Grade

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; derive the equation $y=mx$ for a line through the origin and the equation $y=mx+b$ for a line intercepting the vertical axis at b .

8.EE.A.4: Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology.

8.EE.A.3: Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.

8.G.C.9: Know the formula for the volume of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

8.SP.A.1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

8.SP.A.2: Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line and informally assess the model fit by judging the closeness of the data points to the line.

Integration of Climate Change:

- 8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. 🌱
Climate Change Example: Students may use the formula for the volume of a sphere to approximate the volume of hailstones to consider how climate change may affect the size of hailstones over time.
- 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. 🌱
Climate Change Example: Students may construct and interpret scatterplots of measurement data to investigate patterns of association in bivariate data involving the amount of a greenhouse gas in the atmosphere and its effect on temperature.

Dynamic Learning Map Essential Elements/New Jersey Student Learning Standards:

EE.8.G.1. Recognize translations, rotations, and reflections of shapes.

EE.8.G.2. Identify shapes that are congruent.

EE.8.G.4. Identify similar shapes with and without rotation.

EE.8.G.5. Compare any angle to a right angle, and describe the angle as greater than, less than, or congruent to a right angle.

EE.8.EE.3–4. Compose and decompose whole numbers up to 999.

EE.8.G.9. Use the formulas for perimeter, area, and volume to solve real-world and mathematical problems (limited to perimeter and area of rectangles and volume of rectangular prisms).

EE.8.SP.4. Construct a graph or table from given categorical data, and compare data categorized in the graph or table.

Special Services - Math - 8th Grade

EE.S-ID.1–2. Given data, construct a simple graph (line, pie, bar, or picture) or table, and interpret the data.		
EE.S-ID.3. Interpret general trends on a graph or chart.		
Career Readiness, Life Literacies and Key Skills		
Standard	Performance Expectations	Core Ideas
9.4.8.DC.7	Collaborate within a digital community to create a digital artifact using strategies such as crowdsourcing or digital surveys.	Digital communities are used by individuals to share information, organize, and engage around issues and topics of interest.
9.4.8.IML.3	Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping	Digital tools make it possible to analyze and interpret data, including text, images, and sound. These tools allow for broad concepts and data to be more effectively communicated.
9.4.8.IML.4	Ask insightful questions to organize different types of data and create meaningful visualizations.	
9.4.8.IML.7	Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose	Sources of information are evaluated for accuracy and relevance when considering the use of information.
9.4.8.TL.1	Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making	Some digital tools are appropriate for gathering, organizing, analyzing, and presenting information, while other types of digital tools are appropriate for creating text, visualizations, models, and communicating with others.
9.4.8.TL.2	Gather data and digitally represent information to communicate a real-world problem	
9.4.8.TL.5	Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.	Digital tools allow for remote collaboration and rapid sharing of ideas unrestricted by geographic location or time.
<u>Central Idea/Enduring Understanding:</u> Volume of shapes is useful in everyday life. Volume is used when cooking/baking, filling a gas tank, or even adding detergent to a washing machine. Finding the volume is a life skill used often in everyday situations. Analyzing data is also an essential skill. It allows for more abstract thoughts to be presented visually.		<u>Essential/Guiding Question:</u> How can you determine congruence and similarity? What is the key difference between shapes that are congruent and shapes that are similar? What is the relationship between perimeters and areas of similar figures? Why are formulas important in math and science? How can you represent data collected? How can you gain information from various graphs? How can you compare data taken from graphs?
<u>Content:</u> • Congruence Vs. Similarity • Congruence and Transformations		<u>Skills(Objectives):</u> Compare and contrast congruence and similarity Defend why polygons are similar

Special Services - Math - 8th Grade

• Area and Perimeter of Figures • Volume of Cylinders • Volume of Cones • Volume of Spheres • Measures of Variation • Analyze Data Distributions • Construct Graphs • Bar Graph • Line Graph • Pie Charts • Pictograph	Differentiate between similar and congruent shapes Relate area and perimeters of figures Define volume Classify the various 3D shapes Solve volume problems using the different formulas Construct graphs based on data Analyze various graphs (bar, line, pie, picture) Compare data presented in graphs Interpret trends presented in graphs
<u>Interdisciplinary Connections:</u> Make sense of problems and persevere in solving them Reason abstractly and quantitatively Model with mathematics Use appropriate tools strategically Attend to precision Look for and make use of structure Look for and express regularity in repeated reasoning	
Stage 2: Assessment Evidence	
<u>Performance Task(s):</u> <u>Performance Task 1:</u> Congruence Vs. Similarity • Students will use a graphic organizer to compare and contrast congruence and similarity • Students will explain why shapes are similar and not congruent and vica versa • Students will practice/sort shapes based on congruence and similarity. <u>Performance Task 2:</u> Volume • Students will identify 3D shapes in everyday situations • Students will understand the different attributes of spheres, cones, and cylinders • Students will use the volume formulas to solve real life problems <u>Performance Task 3:</u> Graphs • Students will identify populations and samples based on surveys and/or other data sets.	<u>Other Evidence:</u> Teacher created materials Written and online assignments Glencoe Math Review Sheets Exit Tickets Cornell Notes Teacher created quizzes/tests Modified CFA Observations Projects Class Discussions

Special Services - Math - 8th Grade

- Students will create their own survey and be able to pull important information from the data.
- Students will analyze graphs and use the graphs to compare data sets.

Stage 3: Learning Plan

Learning Opportunities/Strategies:

Congruence Vs. Similarity:

- Students will begin with guided notes on the definition of congruence and similarity.
- Students will have a flowchart that will lead them through a variety of questions to help them understand how to identify if shapes are congruent or similar.
- Students will use the flowchart to work through task cards and review worksheets.

Volume:

- Students will begin with a google slides interactive notebook. In the notebook will be guided notes on each 3D shape first breaking down its attributes. After it will go into the specific formula for the volume of that particular shape. Finally will be step by step boxes of how to solve a volume problem.
- Students will find volume of 3D shapes in real life.
- Students will look at jars of food items, which will represent cylinders. Students will look at ice cream cones. Students will even look at candies that are a sphere shape or a sports ball.

Graphs:

- Students will identify the key terms used in surveys with foldables as well as graphic organizers.
- Students will identify various types of graphs. A graphic organizer will be provided to guide students through how to find important information in different types of graphs.

Resources:

LGBT and Disabilities Law

[Inclusive Math Class](#)

[GLSEN Educator Resources](#)

Google Classroom

Google Slides

Google Sheets and Forms

Glencoe Math

Instructional Videos

TeachersPayTeachers

STEM activities

Teacher created materials

Kahoot

Khan Academy

GimKit

BrainPop

EdPuzzle

Flocabulary

MathTV

IXL

Visual Manipulatives App

Desmos

Blooket

ALEKS

Special Services - Math - 8th Grade

- Students will create their own survey. They will surveying teachers and other students in the school. - After they complete their survey they will use the data to form a graph of their information. A step by step guide will be provided to guide students through the project.			
Differentiation *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation			
High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Khan Academy Project based learning Challenging problems with higher degree of difficulty Higher order thinking questions Differentiation of pacing and activities Differentiation of learning strategies: visual, auditory, kinetic and cooperative Enrichment and extension Technology connection Practice assignments	Tutoring Tables Graphic organizers Differentiation of learning strategies: visual, auditory, kinetic and cooperative Technology connection Practice Assignments Puzzle time activities Record and practice journal Differentiating the lesson activities Lesson tutorials Skills review handbook	Provide a highly structured, predictable learning environment Provide organizers/study guides Lessons designed to the style of learning that matches the student Cooperative Learning Positive reinforcement Announce test with adequate prep time Lessons presentation available on google classroom Frequent check for understanding Break down task into manageable units One-on-one instruction Tutoring Pair student with a high achieving student	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

Special Services - Math - 8th Grade

Pacing Guide

Course Name	Resource	Major Standards	Supporting	Essential Elements
MP				
MP 1: UNIT 1: Review Material and Equations (32 days)	CHAPTERS 2 (Lessons 1, 2) 3 (Lessons 1, 2, 3) Unit Online Assessment: (2 days)	8.EE.C.7 8.EE.C.7a 8.EE.C.7b 8.EE.B.5 8.EE.B.6 8.F.A.2 8.F.B.4 8.F.A.3 8.EE.C.8 8.EE.C.8a 8.EE.C.8b 8.EE.C.8c		EE.8.EE.5–6 EE.8.EE.7 EE.8.F.1–3 EE.8.F.4
MP				
UNIT 2: Linear Equations and Linear/Nonlinear Functions (32 days)	CHAPTERS 3 (Lessons 3, 4) 4 (Lessons 1, 2, 3, 6, 7) Unit Online Assessment: (2 days)	8.EE.B.6 8.F.A.3 8.F.B.4 8.EE.C.8c 8.EE.C.8 8.EE.C.8a 8.EE.C.8b 8.F.A.1 8.F.A.2 8.F.B.5		EE.8.EE.5–6 EE.8.F.1–3 EE.8.F.4 EE.8.F.5
MP				
UNIT 3 Exponents, Triangles, and Transformations (52 days)	CHAPTERS 1 (Lessons 1, 2, 8) 5 (Lesson 1, 2, 3) 6 (Lessons 1, 2, 3, 4) Unit Online Assessment: (2 days)	8.EE.A.1 8.EE.A.2 8.G.A.5 8.G.B.6 8.G.B.7 8.G.B.8 8.G.A.1 8.G.A.3	8.NS.A.1 8.NS.A.2	EE.8.EE.1 EE.8.EE.2 EE.8.G.1 EE.8.G.2 EE.8.G.4 EE.8.G.5 EE.8.NS.1 EE.8.NS.2.a EE.8.NS.2.b
MP				
UNIT 4 Congruence & Similarity, Volume, Data Analysis, & Scientific Notation (52 days)	CHAPTERS 7 (Lessons 1, 2, 3) 8 (Lessons 1, 2, 3) Analyzing graphs and constructing graphs created through teacher assignments Unit Online Assessment: (2 days)	8.G.A.1 8.G.A.1a 8.G.A.1b 8.G.A.2 8.G.A.4 8.G.A.5 8.EE.B.6 8.EE.A.4 8.EE.A.3	8.G.C.9 8.SP.A.1 8.SP.A.2 8.SP.A.3 8.SP.A.4 S.ID.1 S.ID.2 S.ID.3	EE.8.G.1 EE.8.G.2 EE.8.G.4 EE.8.G.5 EE.8.EE.3–4 EE.8.G.9 EE.8.SP.4 EE.S-ID.1–2 EE.S-ID.3