Grade 8 Math

Unit 1 - Expressions and Number Sense

Content Area: Mathematics	
Course & Grade Level: Math 8	

Summary and Rationale

The study of numbers and their relationships is critical to building number sense and fluency with operations. A deeper understanding of numerical operations comes from looking at numbers algebraically and removing value from the discussion. This unit involves the study of numerical and algebraic operations. Students will use algebraic methods to efficiently solve real world and mathematical applications involving volume of cylinders, cones, and spheres. Students will expand upon the fundamental rules of simplifying and evaluating algebraic expressions to develop a deeper understanding of the processes of mathematics.

Recommended Pacing

26 days

New Jersey Student Learning Standards for Mathematics

Standard	Cumulative Progress Indicator (CPI)
8.G.9	Know the formulas for the volumes of cones, cylinders, and spheres, and use them to solve real world and mathematical problems.
8.EE.7b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
7.NS.A.1d	Apply properties of operations as strategies to add and subtract rational numbers.
7.NS.A.2c	Apply properties of operations as strategies to multiply and divide rational numbers.
6.NS.C.7c	Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of -30 dollars, write |-30| = 30 to describe the size of the debt in dollars*.

New Jersey Student Learning Standards for English Language Arts
Companion Standards

Standard: Science Key Ideas and Details

CPI #	Cumulative Progress Indicator (CPI)
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

New Jersey Student Learning Standards for 21st Century Life and Careers

Career Ready Practices

CPI #	Cumulative Progress Indicator (CPI)
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.

New Jersey Student Learning Standards for Technology

CPI #	Cumulative Progress Indicator (CPI)
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Instructional Focus

Unit Enduring Understandings
- Our number system is complex and formed by many sets of numbers.
- Algebra can help us find missing information when working with a geometric models.

Unit Essential Questions
- What does it mean to evaluate an expression?
- How does the order of operations apply when evaluating expressions?
- What are the rules for integer operations?

Objectives

Students will know:
Vocabulary: Integer, opposites, absolute value, evaluate, expressions, PEMDAS, volume, distributive, distributive property, cylinder, cone, sphere, like terms, simplify

Students will be able to:
- Simplify multi-step algebraic expressions using order of operations, distributive property, combining like-terms, and integer rules.
- Evaluate expressions and formulas to calculate volume of three-dimensional figures.

Evidence of Learning	
Assessments	
Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.	
Competencies for 21st Century Learners	
Collaborative Team Member	Effective Communicator
Globally Aware, Active, & Responsible Student/Citizen	Information Literate Researcher
Innovative & Practical Problem Solver	Self-Directed Learner
Resources	

Core Text: Big Ideas Math 8 Textbook - (Chapter 8 Sections 1, 2, 3), (Big Ideas Math 8 Skills Review and Basic Skills Handbook)
Suggested Resources: Big Ideas Math 8 Supplemental Materials

Unit 2 - Solving One-Variable Equations

Content Area: Mathematics

Course & Grade Level: Math 8

Summary and Rationale

Using equations to model real world problems and mathematical applications is a fundamental skill that will lead to future success in higher-level mathematics. This unit involves solving linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. Students will understand the theory behind the procedures and the need for efficiency when solving.

Recommended Pacing

22 days

New Jersey Student Learning Standards for Mathematics

Standard	Cumulative Progress Indicator (CPI)
8.EE.7a	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
8.EE.7b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

New Jersey Student Learning Standards for English Language Arts Companion Standards

Standard: Science Key Ideas and Details

CPI #	Cumulative Progress Indicator (CPI)
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

New Jersey Student Learning Standards for 21st Century Life and Careers

Career Ready Practices

CPI #	Cumulative Progress Indicator (CPI)
CRP2.	Apply appropriate academic and technical skills.

New Jersey Student Learning Standards for Technology

CPI #	Cumulative Progress Indicator (CPI)
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Instructional Focus

Unit Enduring Understandings
- Every one variable equation does not have one solution.
- The structures of algebra help us to find solutions efficiently.

Unit Essential Questions
- How can you solve multi-step equations?
- How can you check the reasonableness of your solution?

Objectives

Students will know:

Vocabulary: equation, variable, inverse operation, distribute, distributive property, like terms, isolate, balanced

Students will be able to:
- Solve multi-step linear equations with rational number coefficients.
- Solve and identify linear equations in one variable that have one solution.
- Solve multi-step linear equations with variables on both sides.

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

	Collaborative Team Member		Effective Communicator
	Globally Aware, Active, & Responsible Student/Citizen		Information Literate Researcher
	Innovative & Practical Problem Solver		Self-Directed Learner

Resources

Core Text: Big Ideas Math 8 Textbook - (Chapter 1 Sections 1-3)
Suggested Resources: Big Ideas Math 8 Supplemental Materials

Unit 3 - Exponents and Roots

Content Area: Mathematics
Course & Grade Level: Math 8

Summary and Rationale

Not all numbers have an exact value on a number line. Irrational numbers can be expressed in their simplest form ($\sqrt{2}$) or can be estimated (1.4). This unit involves the study of integer exponents and roots. Students will explore the different exponent rules and their applications. Students will evaluate square roots of small perfect squares and approximate non perfect squares. Students will apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world and mathematical problems. Through this work, students will develop an understanding of when an estimate is appropriate and when an exact number is needed.

Recommended Pacing

25 days

New Jersey Student Learning Standards for Mathematics

Standard	Cumulative Progress Indicator (CPI)
8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions.
8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form $x2 = p$ and $x3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.
8.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 eventually into a rational number.
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.
8.G.6	Explain a proof of the Pythagorean Theorem and its converse.
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.
8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
New Jersey Student Learning Standards for Science	
CPI #	**Cumulative Progress Indicator (CPI)**
MS-LS4-6	Use mathematical representation to support how natural selection may lead to increases or decreases of specific traits in populations over time.
Instructional Focus	
Unit Enduring Understandings	

- Irrational numbers can be used in their simplest form to give an exact answer to a problem.
- There are appropriate times to give an exact answer and times to estimate an irrational answer.
- Patterns exist in different sets of numbers and they model real-world phenomena.
- The Pythagorean Theorem an important mathematical idea in both theory and real world usage.

Unit Essential Questions

- How is the square root of a perfect square different than a square root of a non-perfect square?
- How can you use inductive reasoning to observe patterns and write general rules involving properties of exponents?
- How can you evaluate a non-zero number with an exponent of zero? With a negative integer?
- How are the lengths of the sides of a right triangle related?

Objectives

Students will know:

Vocabulary: Square Root, Exponents, Power, Base, Pythagorean Theorem, Hypotenuse, Legs, Expanded Form, Perfect Square, Non-Perfect Square

Students will be able to:

- Apply properties of integer exponents (product of powers, power of a power, power of a quotient, zero, negative) to generate equivalent expressions
- Apply the Pythagorean Theorem to find the missing side lengths of right triangles
- Evaluate square roots and use them to make approximations of irrational numbers

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

Collaborative Team Member	Effective Communicator
Globally Aware, Active, & Responsible Student/Citizen	Information Literate Researcher
Innovative & Practical Problem Solver	Self-Directed Learner

Resources

Core Text: Big Ideas Math 8 Textbook - (Chapter 10 Sections 1-4) (Chapter 7 Sections 1, 3, 4, 5)
Suggested Resources: Big Ideas Math 8 Supplemental Materials

Unit 4 - Transformations

Content Area: Mathematics

Course & Grade Level: Math 8

Summary and Rationale

Similarity is used for indirect measurement, scale model, cropping photos and much more. An understanding of congruence and proportionality will help students solve real world problems when manipulating graphics is needed. This unit involves the study of congruence and similarity of figures. Students will verify experimentally the properties of reflections and translations. Students will describe the effect of dilations on two-dimensional figures.

Recommended Pacing

12 days

New Jersey Student Learning Standards for Mathematics

Standard	Cumulative Progress Indicator (CPI)
8.G.1	Verify experimentally the properties of rotations, reflections, and translations: Lines are taken to lines, and line segments to line segments of the same length. Verify experimentally the properties of rotations, reflections, and translations: Angles are taken to angles of the same measure.
8.G.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.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
8.G.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.

New Jersey Student Learning Standards for English Language Arts Companion Standards

Standard: Science Key Ideas and Details

CPI #	Cumulative Progress Indicator (CPI)
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

New Jersey Student Learning Standards for 21st Century Life and Careers

Career Ready Practices

CPI #	Cumulative Progress Indicator (CPI)
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.

New Jersey Student Learning Standards for Technology

CPI #	Cumulative Progress Indicator (CPI)
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Instructional Focus

Unit Enduring Understandings
- Rigid transformations preserve congruence. Not all transformations are rigid.
- Similarity can be used to solve real-world problems.

Unit Essential Questions
- How can you identify congruent triangles?
- How can you manipulate an object on a plane?
- How do changes in the dimensions of similar geometric figures affect the size of the new figure?

Objectives

Students will know:

Vocabulary: Corresponding, Congruency, Transformation, Translation, Reflection, Dilation, Scale Factor, Similar

Students will be able to:
- Use corresponding angles and sides to identify congruent figures
- Identify translations, reflections, rotations and dilations of polygons in the coordinate plane
- Identify the relationships between corresponding sides of similar figures

Evidence of Learning

Assessment - Teacher created

Competencies for 21st Century Learners

Collaborative Team Member	Effective Communicator
Globally Aware, Active, & Responsible Student/Citizen	Information Literate Researcher
Innovative & Practical Problem Solver	Self-Directed Learner

Resources

Core Text: Big Ideas Math 8 Textbook - (Chapter 2 Sections 1-3 and 7)
Suggested Resources: Big Ideas Math 8 Supplemental Materials

Unit 5 - Functions

Content Area: Mathematics

Course & Grade Level: Math 8

Summary and Rationale

There are many relationships between sets of numbers. Functions are important set of relationships that help us model phenomena, understand data and solve problems. This unit involves the study of functions, modeling the relationship between quantities and the ways in which these relationships are represented. Students will learn to understand the definition of a function as a rule that assigns each input to exactly one output and explore the differences between linear and non-linear functions.

Recommended Pacing

9 days

New Jersey Student Learning Standards for Mathematics

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

New Jersey Student Learning Standards for English Language Arts
Companion Standards

Standard: Science Key Ideas and Details

CPI #	Cumulative Progress Indicator (CPI)
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Instructional Focus

Unit Enduring Understandings

- Functions model real world phenomena, help us predict outcomes and solve problems.
- Not every relationship is a function.
- There is a relationship between an equation, its graph and a table of values.

Unit Essential Questions

- What is a relation and what is a function?
- What is a linear and non-linear function?
- How can you use different representations of functions to show the relationship between two data sets?

Objectives

Students will know:

Vocabulary: Function, Input, Output, Coordinate Plane, Function Rule, Mapping Diagram, Vertical Line Test, Ordered Pairs, Linear, Non-Linear, Domain, Range

Students will be able to:

- Determine if a relation is a function.
- Graph a function using an input-output table.
- Compare and express functions in different ways (words, tables, and graphs).
- Understand that y= mx +b is a linear function and recognize nonlinear functions.
- Analyze and describe graphs that represent real-world situations

Evidence of Learning
Assessment
Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.
Competencies for 21st Century Learners

	Collaborative Team Member		Effective Communicator
	Globally Aware, Active, & Responsible Student/Citizen		Information Literate Researcher
	Innovative & Practical Problem Solver		Self-Directed Learner

Resources
Core Text: Big Ideas Math 8 Textbook - (Chapter 6 Sections 1, 2, 4, 5), (Chapter 4 Section 1)   **Suggested Resources: Big Ideas Math 8 Supplemental Materials**

Unit 6 - Linear Equations and Graphing

Content Area: Mathematics	
Course & Grade Level: Math 8	

Summary and Rationale

Linear functions are a specific type of function that is used to model real life situations with a constant rate of change. This unit involves the study of linear functions and their characteristics including slope and intercepts. Students will graph and write linear functions, model real world relationships between quantities and compare linear functions across multiple representations. Students will also explore scatterplots and use lines of best fit to make predictions about data.

Recommended Pacing

22 days

New Jersey Student Learning Standards for Mathematics

Standard	Cumulative Progress Indicator (CPI)
8.EE.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.7b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
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 association, and nonlinear association.
8.SP.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*
8.F.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. *For example, the function A = s^2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*
8.F.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.

New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

New Jersey Student Learning Standards for 21st Century Life and Careers

Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.

New Jersey Student Learning Standards for Technology

CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Instructional Focus

Unit Enduring Understandings

- Two variable equations help us to understand bivariate data.
- Functions can be represented by an equation, table or graph.
- Functions help us to model and make sense of real world problems.

Unit Essential Questions

- What does the slope of a line tell you about the line?
- What are the different ways to describe a line?
- What is slope intercept form?
- How do you create, write, and graph equations in slope intercept form?
- How does a scatter plot help you understand a set of data?
- How can you use data/line of best fit to predict an event?

Objectives
Students will know:
Vocabulary: Linear Function, Slope, Rise, Run, y-intercept, Slope-Intercept Form, scatter plot, positive correlation, negative correlation, no correlation, outliers, clusters, line of best fit
Students will be able to: ● understand the behavior of a line by interpreting its slope ● determine the slope of a line by analyzing the graph and/or applying the slope formula ● understand the components of slope-intercept form of a line and apply them to create its graph ● write an equation of the line using the slope and the y-intercept ● re-write linear equations into slope-intercept form ● Interpret scatter plots ● make predictions based on data and/or line of best fit

Evidence of Learning

Assessment
Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

	Collaborative Team Member		Effective Communicator
	Globally Aware, Active, & Responsible Student/Citizen		Information Literate Researcher
	Innovative & Practical Problem Solver		Self-Directed Learner

Resources

Core Text: Big Ideas Math 8 Textbook - (Chapter 4 Sections 2, 4, 6), (Chapter 1 Section 4), (Chapter 9 Sections 1, 2)
Suggested Resources: Big Ideas Math 8 Supplemental Materials

Unit 7 - Systems of Linear Equations	
Content Area: Mathematics	
Course & Grade Level: Math 8	

Summary and Rationale	
This unit involves the study of systems or sets of linear equations. Students will develop a graphical understanding of the solution to a system as the point of intersection of the two lines. Students will learn how to solve systems by graphing and algebraically through substitution and elimination.	

Recommended Pacing	
8 days	

New Jersey Student Learning Standards for Mathematics	
Standard	**Cumulative Progress Indicator (CPI)**
8.EE.7a	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
8.EE.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.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.8b	Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.*
8.EE.8c	Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*

New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

New Jersey Student Learning Standards for 21st Century Life and Careers

Career Ready Practices

CPI #	Cumulative Progress Indicator (CPI)
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.

New Jersey Student Learning Standards for Technology

CPI #	Cumulative Progress Indicator (CPI)
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Instructional Focus

Unit Enduring Understandings
- Systems of linear equations help us model and solve problems.
- There are different types of systems.
- Algebraic methods can help us to solve a system efficiently.

Unit Essential Questions
- What is a system of equations?
- How can you solve a system of equations?
- What are solutions to a system of equations?

Objectives

Students will know:
Vocabulary: System of Equations, Substitution, Elimination, Solution
Students will be able to:
- Solve a system of equations through graphing and algebraically through substitution, and elimination.
- Solve system of equations with no solution or infinitely many solutions by graphing

Evidence of Learning	
Assessment	
Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.	
Competencies for 21st Century Learners	
Collaborative Team Member	Effective Communicator
Globally Aware, Active, & Responsible Student/Citizen	Information Literate Researcher
Innovative & Practical Problem Solver	Self-Directed Learner
Resources	
Core Text: Big Ideas Math 8 Textbook - (Chapter 5 Sections 1-4) **Suggested Resources: Big Ideas Math 8 Supplemental Materials**	

Unit 8 - Angles and Triangles

Content Area: Mathematics

Course & Grade Level: Math 8

Summary and Rationale

Geometric figures help us to describe and understand the world around us. By exploring their relationships, we can model real world situations and improve our inductive and deductive reasoning skills. This unit involves the study of angle relationships created when parallel lines are cut by transversals, the interior angle measures of polygons and similar triangles. Students will expand upon knowledge of supplementary and vertical angles and use construction to informally establish facts about angle pairs. Students will be able to name angle pairs and corresponding parts of similar figures and find measures of missing angles and sides.

Recommended Pacing

12 days

New Jersey Student Learning Standards for Mathematics

Standard	Cumulative Progress Indicator (CPI)
8.G.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. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so*.

New Jersey Student Learning Standards for English Language Arts Companion Standards

Standard: Science Key Ideas and Details

CPI #	Cumulative Progress Indicator (CPI)
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

New Jersey Student Learning Standards for 21st Century Life and Careers

Career Ready Practices

CPI #	Cumulative Progress Indicator (CPI)
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason

CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.

New Jersey Student Learning Standards for Technology

CPI #	Cumulative Progress Indicator (CPI)
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Instructional Focus

Unit Enduring Understandings

- Inductive reasoning is the first step to proving theorems deductively.
- Geometric figures help us to organize, explain and describe the real world.

Unit Essential Questions

- How can you describe angles formed by parallel lines and transversals?
- How can you describe the relationship among the angles of polygons?

Objectives

Students will know:

Vocabulary: Transversal, Interior Angles, Exterior Angles, Corresponding Angles, Regular Polygon,

Students will be able to:

- Understand the relationships between corresponding sides and angles of similar figures
- Identify and find measures of angles formed when parallel lines are cut by a transversal
- Understand and find the measures of interior angles of triangles
- Understand and find the measures of interior angles of polygons

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

	Collaborative Team Member		Effective Communicator
	Globally Aware, Active, & Responsible Student/Citizen		Information Literate Researcher
	Innovative & Practical Problem Solver		Self-Directed Learner

Resources

Core Text: Big Ideas Math 8 Textbook - (Chapter 3 Sections 1-4)
Suggested Resources: Big Ideas Math 8 Supplemental Materials