



Washington Township School District



The mission of the Washington Township Public Schools is to provide a safe, positive, and progressive educational environment that provides opportunity for all students to attain the knowledge and skills specified in the NJ Learning Standards at all grade levels, so as to ensure their full participation in an ever-changing world as responsible, self-directed, and civic-minded citizens.

Course Title:	Grade 8 Pre-Algebra					
Grade Level(s):	8					
Duration:	<i>Full Year:</i>	X	<i>Semester:</i>		<i>Marking Period:</i>	
Course Description:	<p>The goal of the Grade 8 Pre-Algebra curriculum is to help students develop mathematical reasoning as well as an understanding of the concepts, skills, and procedures in respect to the following areas:</p> <ol style="list-style-type: none"> 1) Formulating and reasoning about expressions and equations, including modeling and association in bivariate data with a linear equation, and solving linear equations and systems of linear equations. 2) Grasping the concept of a function and using functions to describe quantitative relationships. 3) Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem. <p>Subsequently, an awareness of and appreciation for the rich connections among mathematical strands as well as other disciplines will be developed. The eighth-grade mathematics curriculum development has been guided by the mathematical practice standards: All students should be able to make sense of problems and persevere in solving them, reason abstractly and quantitatively, construct viable arguments and critique the reasoning of others, 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. Students should also have knowledge of and skill in the use of the vocabulary, forms of representation, materials, tools, techniques, and intellectual methods of the discipline of mathematics, including the ability to define and solve real-world problems with reason, insight, inventiveness, and technical proficiency.</p>					
Grading Procedures:	Each semester will be a composite of quiz scores, test scores, homework, and participation reflecting a student's mastery of the areas outlined above. The student					

	can pass the course with an overall average of 60%. The individual teacher will explain the grading system to the student.
Primary Resources:	New Jersey Student Learning Standards McGraw Hill Reveal Math, Course 3

Washington Township Principles for Effective Teaching and Learning

- Implementing a standards-based curriculum
- Facilitating a learner-centered environment
- Using academic target language and providing comprehensible instruction
- Adapting and using age-appropriate authentic materials
- Providing performance-based assessment experiences
- Infusing 21st century skills for College and Career Readiness in a global society

Designed by:	Jennifer Reilly and Deanna Petito
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Under the Direction of:	Carole English (2022) and Allison Krzyminski (2024)
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Written: July 2022

Revised: July 2024

BOE Approval:

Unit Title: The Number System	
Unit Description: In this unit, students will use their prior knowledge of the set of rational numbers to develop understanding of the set of real numbers. By having a solid understanding of real numbers, students will be better prepared to study more advanced mathematical concepts in later courses as well as making mathematical connections in everyday life.	
Unit Duration: 14 Days	
Desired Results	
Standard(s): 8.NS.A. Know that there are numbers that are not rational, and approximate them by rational numbers	
Indicators: 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 (e.g., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations. 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. (NEW 2023)	
Understandings: <i>Students will understand...</i> <ul style="list-style-type: none"> That the decimal form of a rational number either terminate in zeros or eventually repeats What it means for a number to be a square root, and what it means for a number to be a perfect square What it means for a number to be a cube root, and what it means for a number to be a perfect cube That the set of real numbers are numbers that can be found on the number line That a number line can be used to approximate irrational numbers How to compare and order real numbers 	Essential Questions: <ol style="list-style-type: none"> Why do we classify numbers? What does it mean for a decimal to be a terminating decimal? What does the square root of a number mean? What different types of numbers can be found on the number line? How does a square model help you find the square root of a non-perfect square?
Assessment Evidence	
Performance Tasks: <ul style="list-style-type: none"> Warm-ups Exit Tickets Reveal Practice Assignments Quiz: Lessons 2.1 and 2.2 GoFormative Assignments 	Other Evidence: <ul style="list-style-type: none"> Independent Work Class Discussions Online Activities Practice and Homework Kahoot Quizizz Quizlet Blooket

Benchmarks:

Departmental assessment for Module 2 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Plan

Learning Activities:**Module 2 Lesson 1: Terminating and Repeating Decimals**

Students will show the decimal form of a rational number repeats eventually and convert a repeating decimal into a rational number.

- Launch the Lesson
- Explore - Terminating Decimals
- Learn – Rational Numbers
- Learn - Terminating and Repeating Decimals
- Example 1 – Write Fractions as Decimals
- Example 2 – Write Mixed Numbers as Decimals
- Learn – Write Repeating Decimals as Fractions
- Example 3 – Write Repeating Decimals as Fractions
- Example 4 – Write Repeating Decimals as Mixed Numbers
- Apply - Baseball

Module 2 Lesson 2: Roots

Students will calculate square roots and cubes roots and use these operations to solve equations.

- Explore – Find Square Roots Using a Square Model
- Learn – Square Roots
- Example 1 – Find Positive Square Roots
- Example 2 – Find Both Square Roots
- Example 3 – Find Negative Square Roots
- Example 4 – Square Roots of Negative Numbers
- Learn – Use Square Roots to Solve Equations
- Example 5 – Use Square Roots to Solve Equations
- Learn – Cube Roots
- Example 6 – Cube Roots of Positive Numbers
- Example 7 – Cube Roots of Negative Numbers
- Example 8 – Use Cube Roots to Solve Equations
- Apply – Bulletin Boards

Module 2 Lesson 3: Real Numbers

Students will identify, classify, and describe sets of real numbers.

- Explore – Real Numbers
- Learn – Real Numbers
- Example 1 – Identify Real Numbers
- Example 2 – Classify Real Numbers
- Example 3 – Classify Real Numbers
- Example 4 – Classify Real Numbers
- Learn – Describe Sets of Real Numbers
- Example 5 – Describe Sets of Real Numbers
- Example 6 – Describe Sets of Real Numbers

Module 2 Lesson 4: Estimate Irrational Numbers

Students will approximate irrational square roots and cube roots.

- Explore – Roots of Non-Perfect Squares
- Learn – Estimate Irrational Numbers Using a Number Line
- Example 1 – Estimate Square Roots to the Nearest Integer
- Example 2 – Estimate Square Roots to the Nearest Tenth
- Example 3 – Estimate Cube Roots to the Nearest Integer
- Learn – Estimate Irrational Numbers by Truncating
- Example 4 – Estimate by Truncating
- Apply – Golden Rectangle

Module 2 Lesson 5: Compare and Order Real Numbers

Students will compare and order real numbers.

- Launch the Lesson
- Learn: Compare and Order Real Numbers
- Example 1 - Compare Real Numbers
- Example 2 - Compare Real Numbers
- Example 3 - Order Real Numbers
- Example 4 - Use Real Numbers
- Apply - Line of Sight

Resources:

- Textbook: McGraw Hill Reveal Math, Course 3
- Student Workbooks: McGraw Hill Reveal Math, Course 3
- Technology: McGraw Hill Online Platform, Teacher 2 in 1 Device, Projector, Student Laptops, Calculators
- Number Lines
- Perfect Squares and Cubes Chart

Unit Modifications for Special Population Students	
Advanced Learners	<ul style="list-style-type: none"> - Refer to green BL (Beyond Level) indicators in Teacher Edition and assign corresponding activities: Beyond Level Differentiated Activities, Extension Activities - Use IXL to enhance targeted skills
Struggling Learners	<ul style="list-style-type: none"> - Refer to orange AL (Approaching Level) indicators in Teacher Edition and assign corresponding activities: Remediation Activities, Extra Examples, Arrive Math Take Another Look Mini Lessons - Use IXL to enhance targeted skills
English Language Learners	Refer to purple ELL (English Language Learner) indicators in Teacher Edition and assign corresponding activities
Special Needs Learners	<p>Each special education student has an Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of time: adapting the time allotted for learning, task completion, or testing • Variation of input: adapting the way instruction is delivered • Variation of output: adapting how a student can respond to instruction • Variation of size: adapting the number of items the student is expected to complete • Modifying the content, process, or product

Learners with a 504	Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.
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Interdisciplinary Connections

Indicators:

English Language Arts Grade 8

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text

NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone

NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

L.8.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration and communication.

9.3.12.FN.1- Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision making in the finance industry

9.3.ST-SM.2 - *Apply science and mathematic concepts to development of plans, processes and projects that address real world problems*

Unit Title: Expressions and Equations Part 1	
Unit Description: In this unit, students will use their prior knowledge of exponents to develop understanding of the properties of exponents and scientific notation. By having a solid understanding of exponents and scientific notation, students will be better prepared to study more advanced mathematical concepts in later courses as well as within more advanced science concepts. Students will also draw on their knowledge of solving two-step equations to help them solve equations with variables on each side of the equal sign and other multi-step equations.	
Unit Duration: 29 Days	
Desired Results	
Standard(s): 8.EE.A – Work with radicals and integer exponents. 8.EE.C – Analyze and solve linear equations and pairs of simultaneous linear equations.	
Indicators: 8.EE.A.1 – Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$. 8.EE.A.2 – Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. a. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational. b. Simplify numerical radicals, limiting to square roots (i.e. non perfect squares) For example $\sqrt{8}$ to $2\sqrt{2}$ (NEW 2023) 8.EE.A.3 – Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9 , and determine that the world population is more than 20 times larger. 8.EE.A.4 – Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology. 8.EE.C.7 – Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	
Understandings: <i>Students will understand...</i> <ul style="list-style-type: none"> • How to write and evaluate expressions involving powers and exponents. • How to use Laws of Exponents to simplify expressions and find powers of monomials. • How to simplify expressions that have zero and negative exponents. • How scientific notation can be used to write very large or very small numbers in a compact way. • How to choose units of appropriate size and estimating with scientific notation. • How to compute with numbers written in scientific notation. • How to solve multi-step equations with variables on each side. 	Essential Questions: Why are exponents useful when working with very large or very small numbers? How can you simplify an expression containing a series of operations with powers containing like bases? What does it mean when a number has an exponent of zero? What does it mean when a number has a negative exponent? How can you write very large numbers or very small numbers in a different way? How can equations with variables on each side be used to represent everyday situations? Why is writing an equation a useful way to solve real-world problems? How can you translate a real-world problem into a multi-step equation?

<ul style="list-style-type: none"> • That they can model a real-world problem with an equation that has variables on each side. • How to determine the number of solutions to an equation. 	How many solutions can an equation have?
Assessment Evidence	
Performance Tasks: <ul style="list-style-type: none"> • Warm-ups • Exit Tickets • Reveal Practice Assignments • GoFormative Assignments • Quiz: Module 1.1-1.4 • Quiz: Module 1.5-1.6 • Quiz: Module 3.1-3.2 • Quiz: Module 3.3-3.5 	Other Evidence: <ul style="list-style-type: none"> • Independent Work • Class Discussions • Online Activities • Practice and Homework • Kahoot • Quizizz • Quizlet • Blooket
Benchmarks: Departmental assessments for Modules 1 and 3 will be developed from the following resources: On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3. Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.	
Learning Plan	
Learning Activities: Module 1 Lesson 1: Powers and Exponents <i>Students will write and evaluate expressions involving powers and exponents.</i> -Launch the lesson -Explore: Exponents -Example 1 – Write Numerical Products as Powers -Example 2 – Write Algebraic Products as Powers -Learn – Negative Bases and Parentheses -Learn – Evaluate Powers -Example 3 – Evaluate Numerical Expressions -Example 4 – Evaluate Algebraic Expressions -Example 5 – Evaluate Algebraic Expressions -Apply – Mammals Module 1 Lesson 2: Multiply and Divide Monomials <i>Students will use Laws of Exponents to multiply and divide monomials.</i> -Explore – Product of Powers -Learn – Product of Powers -Example 1 – Multiply Numerical Powers -Example 2 – Multiply Algebraic Powers -Example 3 – Multiply Monomials -Explore – Quotient of Powers -Learn – Quotient of Powers -Example 4 – Divide Algebraic Powers -Example 5 – Divide Powers -Example 6 – Divide Numerical Powers -Example 7 – Divide Monomials	

-Apply – Computer Science

Module 1 Lesson 3: Powers of Monomials

Students will use laws of exponents to find powers of monomials.

- Explore – Power of a Power
- Learn – Power of a Power
- Example 1 – Power of a Power
- Example 2 – Power of a Power
- Learn – Power of a Product
- Example 3 – Power of a Product
- Example 4 – Power of a Product
- Apply – Geometry

Module 1 Lesson 4: Zero and Negative Exponents

Students will simplify expressions that have zero and negative exponents.

- Explore – Exponents of Zero
- Learn – Exponents of Zero
- Example 1 – Exponents of Zero
- Explore – Negative Exponents
- Learn – Negative Exponents
- Examples 2-5 – Negative Exponents
- Apply – Measurement

Module 1 Lesson 5: Scientific Notation

Students will write numbers in scientific notation.

- Explore – Scientific Notation
- Learn – Scientific Notation
- Examples 1-2 – Write Numbers in Standard Form
- Learn – Scientific Notation and Technology
- Example 3 – Scientific Notation and Technology
- Learn – Write Numbers in Scientific Notation
- Examples 4-5 – Write Numbers in Scientific Notation
- Learn – Use Scientific Notation
- Example 6 – Choose Units of Appropriate Size
- Example 7 – Estimate with Scientific Notation
- Apply – Travel

Module 1 Lesson 6: Compute with Scientific Notation

Students will compute with numbers written in scientific notation.

- Learn – Multiply and Divide with Scientific Notation
- Example 1 – Multiply with Scientific Notation
- Example 2 – Divide with Scientific Notation
- Learn – Add and Subtract with Scientific Notation
- Example 3 – Add or Subtract with Scientific Notation
- Apply – Population

Module 3 Lesson 1: Solve Equations with Variables on Each Side

Students will solve equations with variables on each side.

- Launch the Lesson
- Explore – Equations with Variables on Each Side
- Learn – Equations with Variables on Each Side
- Example 1 – Solve Equations with Variables on Each Side
- Example 2 – Solve Equations with Rational Coefficients
- Example 3 – Solve Equations with Rational Coefficients

Module 3 Lesson 2: Write and Solve Equations with Variables on Each Side

Students will write and solve equations with variables on each side.

- Explore – Write and Solve Equations with Variables on Each Side
- Learn – Write and Solve Equations with Variables on Each Side
- Example 1 – Write and Solve Equations with Variables on Each Side
- Example 2 – Write and Solve Equations with Variables on Each Side
- Apply – Home Improvement

Module 3 Lesson 3: Solve Multi-Step Equations

Students will solve multi-step equations with variables on each side.

- Learn – Solve Multi-Step Equations
- Example 1 – Solve Multi-Step Equations
- Example 2 – Solve Multi-Step Equations
- Example 3 – Solve Multi-Step Equations

Module 3 Lesson 4: Write and Solve Multi-Step Equations

Students will write and solve multi-step equations with variables on each side.

- Explore – Translate Problems into Equations
- Learn – Write and Solve Multi-Step Equations
- Example 1 – Write and Solve Multi-Step Equations
- Example 2 – Write and Solve Multi-Step Equations
- Apply – Business Finance

Module 3 Lesson 5: Determine Number of Solutions

Students will determine the number of solutions to an equation.

- Explore – Number of Solutions
- Example 1 – Equations with Infinitely Many Solutions
- Example 2 – Equations with No Solution
- Learn – Analyze Equations to Determine the Number of Solutions
- Example 3 – Create Equations with Infinitely Many Solutions
- Example 4 – Create Equations with No Solution
- Apply – School

Resources:

- Textbook: McGraw Hill Reveal Math, Course 3
- Student Workbooks: McGraw Hill Reveal Math, Course 3
- Technology: McGraw Hill Online Platform, Teacher 2 in 1 Device, Projector, Student Laptops, Calculators

Unit Modifications for Special Population Students

Advanced Learners	<ul style="list-style-type: none"> - Refer to green BL (Beyond Level) indicators in Teacher Edition and assign corresponding activities: Beyond Level Differentiated Activities, Extension Activities - Use IXL to enhance targeted skills
Struggling Learners	<ul style="list-style-type: none"> - Refer to orange AL (Approaching Level) indicators in Teacher Edition and assign corresponding activities: Remediation Activities, Extra Examples, Arrive Math Take Another Look Mini Lessons - Use IXL to enhance targeted skills
English Language Learners	Refer to purple ELL (English Language Learner) indicators in Teacher Edition and assign corresponding activities
Special Needs Learners	<p>Each special education student has an Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of time: adapting the time allotted for learning, task completion, or testing • Variation of input: adapting the way instruction is delivered • Variation of output: adapting how a student can respond to instruction • Variation of size: adapting the number of items the student is expected to complete • Modifying the content, process, or product
Learners with a 504	Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.

Interdisciplinary Connections

Indicators:

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NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

L.8.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration, communication, and critical thinking.

9.1.8.CP.1 - Compare prices for the same goods and services

9.1.8.CP.2 - Analyze how spending habits affects one's ability to save

9.1.8.PB.6 - Construct a budget to save for short term, long term and charitable goals

9.1.8.PB.7 - Brainstorm techniques that will help decrease expenses including comparison shopping, negotiating and day to day expense management

9.3.12.FN.1- Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision making in the finance industry

9.3.ST-SM.2 - *Apply science and mathematic concepts to development of plans, processes and projects that address real world problems*

9.4.8.TL.2 - *Gather data and digital represents information to communicate real world problems*

Unit Title: Expressions and Equations Part 2	
Unit Description: In this unit, students will draw on their knowledge of unit rates and proportional relationships to understand slope and will use similar triangles to explain why the slope is the same between any two points on a line. They will explore similarities and differences between linear and proportional models, and derive the linear equation $y = mx + b$. They will also draw on their prior knowledge of linear equations to solve systems of two linear equations both graphically and algebraically. As they explore systems of equations, they will understand what a solution to a system of equations is, and what it means for a system to have one solution, infinitely many solutions, or no solution.	
Unit Duration: 33.5 days	
Desired Results	
Standard(s): 8.EE.B. Understand the connections between proportional relationships, lines, and linear equations 8.EE.C. Analyze and solve linear equations and pairs of simultaneous linear equations	
Indicators: 8.EE.B.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed. 8.EE.B.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b . 8.EE.C.8. Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. b. Solve systems of two linear equations in two variables using the substitution method and estimate solutions by graphing the equations. Solve simple cases by inspections. For example, $3x + 2y = 5$ 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. Solve $y = 3x + 1$ and $y = -2x + 7$ using the substitution method (NEW 2023) c. 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.	
Understandings: <i>Students will understand...</i> <ul style="list-style-type: none"> How proportional relationships are related to linear relationships The relationship between the unit rate of a proportional relationship and the slope of the line That they can compare two proportional relationships that are represented in different ways How to define slope of as the ratio of the vertical change (rise) to the horizontal change (run) of a line. That the slope of a horizontal line is zero and the slope of a vertical line is undefined The relationship between corresponding angles and sides of similar figures The relationship between the slopes of similar slope triangles and the slope of the line 	Essential Questions: <ol style="list-style-type: none"> How are linear relationships related to proportional relationships? How can you demonstrate the concept of slope as you travel from one point to another on a coordinate plane? How can you determine the slope of a horizontal or a vertical line? How does the slope compare between any two pairs of points on a line? How can you use the slope formula to derive the equation of a proportional linear relationship? How can you use the slope formula to derive the equation of a non proportional linear relationship?

<ul style="list-style-type: none"> • That a direct variation is a proportional relationship, and how to derive the direct variation equation, $y=mx$ • How to derive the slope-intercept form of a linear equation, $y=mx+b$ • How the graph of a horizontal line is related to its equation • How the graph of a vertical line is related to its equation 	
Assessment Evidence	
Performance Tasks: <ul style="list-style-type: none"> • Warm-ups • Exit Tickets • Reveal Practice Assignments • GoFormative Assignments • Quiz: Module 4.1-4.3 • Quiz: Module 4.4-4.6 • Quiz: Module 6.1-6.3 	Other Evidence: <ul style="list-style-type: none"> • Independent Work • Class Discussions • Online Activities • Practice and Homework • Kahoot • Quizizz • Quizlet • BlooKet
Benchmarks: Departmental assessments for Modules 4 and 6 will be developed from the following resources: On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3. Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.	
Learning Plan	
Learning Activities: Module 4 Lesson 1: Proportional Relationships and Slope <i>Students will graph and compare proportional relationships, interpreting the unit rate as the slope of the line.</i> -Launch the Lesson -Explore – Rate of Change -Learn – Proportional Relationships -Learn – Unit Rate and Slope -Example 1 – Proportional Relationships and Slope -Example 2 – Graph Proportional Relationships -Example 3 – Graph Proportional Relationships -Learn – Compare Proportional Relationships -Example 4 – Compare Proportional Relationships -Example 5 – Compare Proportional Relationships -Apply - Utilities Module 4 Lesson 2: Slope of a Line <i>Students will find the slope of a line from a graph, table, and using the formula.</i> -Explore – Develop Concepts of Slope -Explore – Slope of Horizontal and Vertical Lines -Learn – Slope of a Line -Learn – Find Slope from a Graph	

- Example 1 – Find Slope from a Graph
- Example 2 – Find Slope from a Graph
- Learn – Find Slope from a Table
- Example 3 – Find Slope from a Table
- Learn – Find Slope Using the Slope Formula
- Example 4 – Find Slope Using the Slope Formula
- Learn – Zero and Undefined Slope
- Example 5 – Zero Slope
- Example 6 – Undefined Slope
- Apply - Income

Module 4 Lesson 3: Similar Triangles and Slope

Students will relate the slope of a line to similar triangles.

- Explore – Right Triangles and Slope
- Learn – Similar Triangles
- Learn – Similar Triangles and Slope
- Example 1 – Compare Slopes of Similar Triangles
- Example 2 – Verify Slopes Using Slope Triangles

Module 4 Lesson 4: Direct Variation

Students will derive the equation $y=mx$ from graphs, tables, and verbal descriptions of proportional relationships.

- Explore – Derive the Equation $y=mx$
- Learn – Direct Variation
- Example 1 – Write Direct Variation Equations from Graphs
- Example 2 – Write Direct Variation Equations from Words
- Example 3 – Write Direct Variation Equations from Tables
- Apply – Animal Care

Module 4 Lesson 5: Slope-Intercept Form

Students will write linear relationships in the form $y=mx+b$.

- Explore – Derive the Equation $y=mx+b$
- Learn – Slope-Intercept Form of a Line
- Example 1 – Identify Slopes and y-Intercepts
- Example 2 – Write Equations in Slope-Intercept Form
- Learn – Write Equations in Slope-Intercept Form from Graphs
- Example 3 – Write Equations in Slope-Intercept Form
- Learn – Write Equations in Slope-Intercept Form from Verbal Descriptions
- Example 4 – Write Equations in Slope-Intercept Form
- Learn – Write Equations in Slope-Intercept Form from Tables
- Example 5 – Write Equations in Slope-Intercept Form
- Apply – Consumer Science

Module 4 Lesson 6: Graph Linear Equations

Students will graph lines in slope-intercept form, vertical lines, and horizontal lines.

- Learn – Graph Equations in Slope-Intercept Form
- Example 1 – Graph Lines Using Slope-Intercept Form
- Example 2 – Graph Lines Using Slope-Intercept Form
- Learn – Graphs of Horizontal Lines
- Example 3 – Graph Horizontal Lines
- Learn – Graphs of Vertical Lines
- Example 4 – Graph Vertical Lines
- Apply – Travel

Module 6 Lesson 1: Solve Systems of Equations by Graphing

Students will solve systems of linear equations by graphing.

- Launch the Lesson
- Explore – Systems of Equations
- Learn – Systems of Equations
- Learn – Solve Systems of Equations by Graphing
- Example 1 – Solve Systems with One Solution by Graphing
- Example 2 – Solve Systems with One Solution by Graphing
- Learn – Write Linear Equations in Slope-Intercept Form
- Learn – Systems of Equations with No Solution
- Example 3 – Solving Systems with No Solution by Graphing
- Learn – Systems of Equations with Infinitely Many Solutions
- Example 4 – Solve Systems by Graphing: Infinitely Many Solutions
- Apply – Bake Sale

Module 6 Lesson 2: Determine Number of Solutions

Students will determine the number of solutions of a system of linear equations by analyzing the equations.

- Explore – Systems of Equations: Slopes and y-Intercepts
- Learn – Systems of Equations: Compare Slopes and y-Intercepts
- Example 1 – Find the Number of Solutions
- Example 2 – Find the Number of Solutions
- Example 3 – Find the Number of Solutions
- Example 4 – Analyze Systems of Equations
- Apply – Hiking

Module 6 Lesson 3: Solve Systems of Equations by Substitution

Students will solve systems of linear equations by using substitution.

- Explore – Solve Systems of Equations by Substitution
- Learn – Solve Systems of Equations by Substitution
- Example 1 – Solve Systems by Substitution
- Learn – Rewrite Equations to Solve Systems by Substitution
- Example 2 – Rewrite One Equation to Solve Systems by Substitution
- Example 3 – Rewrite Both Equations to Solve Systems by Substitution
- Example 4 – Solve Systems with Infinitely Many Solutions
- Example 5 – Solve Systems with No Solutions
- Apply – Greeting Cards

Module 6 Lesson 4: Solve Systems of Equations by Elimination

Students will solve systems of linear equations by using elimination.

- Explore – Solve Systems of Equations by Elimination
- Learn – Solve Systems by Elimination: Addition
- Example 1 – Solve Systems by Elimination: Addition
- Learn – Solve Systems by Elimination: Subtraction
- Example 2 – Solve Systems by Elimination: Subtraction
- Learn – Solve Systems by Elimination: Multiplication
- Example 3 – Multiply One Equation to Eliminate a Variable
- Example 4 – Multiply Both Equations to Eliminate a Variable
- Apply – Packaging

Module 6 Lesson 5: Write and Solve Systems of Equations

Students will write and solve systems of linear equations.

- Learn – Write and Solve Systems of Equations
- Example 1 – Write and Solve Systems of Equations
- Example 2 – Write and Solve Systems of Equations

-Example 3 – Write and Solve Systems of Equations
 -Example 4 – Write and Solve Systems of Equations
 -Apply – Yogurt Shop

Resources:

- Textbook: McGraw Hill Reveal Math, Course 3
- Student Workbooks: McGraw Hill Reveal Math, Course 3
- Technology: McGraw Hill Online Platform, Teacher 2 in 1 Device, Projector, Student Laptops, Calculators
- Graph Paper

Unit Modifications for Special Population Students	
Advanced Learners	<ul style="list-style-type: none"> - Refer to green BL (Beyond Level) indicators in Teacher Edition and assign corresponding activities: Beyond Level Differentiated Activities, Extension Activities - Use IXL to enhance targeted skills
Struggling Learners	<ul style="list-style-type: none"> - Refer to orange AL (Approaching Level) indicators in Teacher Edition and assign corresponding activities: Remediation Activities, Extra Examples, Arrive Math Take Another Look Mini Lessons - Use IXL to enhance targeted skills
English Language Learners	Refer to purple ELL (English Language Learner) indicators in Teacher Edition and assign corresponding activities
Special Needs Learners	<p>Each special education student has an Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of time: adapting the time allotted for learning, task completion, or testing • Variation of input: adapting the way instruction is delivered • Variation of output: adapting how a student can respond to instruction • Variation of size: adapting the number of items the student is expected to complete • Modifying the content, process, or product
Learners with a 504	Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.

Interdisciplinary Connections

Indicators:

English Language Arts Grade 8

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text

NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone

NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

L.8.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration, communication, and critical thinking.

9.1.8.CP.1 - Compare prices for the same goods and services

9.1.8.CP.2 - Analyze how spending habits affects one's ability to save

9.1.8.PB.6 - Construct a budget to save for short term, long term and charitable goals

9.1.8.PB.7 - Brainstorm techniques that will help decrease expenses including comparison shopping, negotiating and day to day expense management

9.3.12.FN.1- Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision making in the finance industry

9.3.ST-SM.2 - *Apply science and mathematic concepts to development of plans, processes and projects that address real world problems*

Unit Title: Functions	
Unit Description: This unit emphasizes identifying functions. Identification first involves functions versus non-functions, then linear functions versus nonlinear functions. Identifying functions can help students obtain a large picture view which is important in their decision making.	
Unit Duration: 16 Days	
Standard(s): 8.F.A Define, evaluate, and compare functions. 8.F.B Use functions to model relationships between quantities.	
Indicators: 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. <i>Clarification: Function notation is not required in Grade 8 (NEW 2023)</i> 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). <i>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.</i> 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. <i>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.</i> 8.F.B.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. 8.F.B.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	
Understandings: <i>Students will understand...</i> <ul style="list-style-type: none"> How to identify functions from mapping diagrams, tables, and graphs. How to create function tables and graph functions. How to construct functions from graphs, tables, and verbal descriptions. How to compare functions represented in different forms. How to identify nonlinear functions using tables, graphs, and equations. How to analyze and sketch qualitative graphs. 	Essential Questions: <ol style="list-style-type: none"> What does it mean for a relationship to be a function? How does a function rule produce an output from an input? How can you compare two functions represented in different forms? How can you determine whether or not a function is linear? How can you use a graph to model a relationship between variables when you don't know specific values?
Assessment Evidence	
Performance Tasks: <ul style="list-style-type: none"> Warm-ups Exit Tickets Reveal Practice Assignments GoFormative Assignments Quiz: Module 5.1-5.3 	Other Evidence: <ul style="list-style-type: none"> Independent Work Class Discussions Online Activities Practice and Homework Kahoot Quizizz Quizlet Blooket

Benchmarks:

Departmental assessment for Module 5 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Plan

Learning Activities:**Module 5 Lesson 1: Identify Functions**

Students will identify functions from mapping diagrams, tables, and graphs.

- Launch the lesson
- Explore – Relations and Functions
- Learn – Relations and Functions
- Learn – Identify Functions Using Mapping Diagrams
- Example 1 – Identify Functions Using Mapping Diagrams
- Learn – Identify Functions Using Tables
- Example 2 – Identify Functions Using Tables
- Learn – Identify Functions Using Graphs
- Example 3 – Identify Functions Using Graphs
- Example 4 – Identify Functions Using Graphs

Module 5 Lesson 2: Function Tables

Students will create function tables and graph functions.

- Explore – An Introduction to Function Rules
- Learn – Function Tables
- Example 1 – Create Function Tables
- Example 2 – Choose Appropriate Input Values
- Learn – Graph Functions
- Example 3 – Graph Linear Functions
- Apply – Transportation

Module 5 Lesson 3: Construct Linear Functions

Students will construct functions from graphs, tables, and verbal descriptions.

- Learn – Rate of Change and Initial Value
- Learn – Construct Linear Functions from Graphs
- Example 1 – Construct Linear Functions from Graphs
- Learn – Construct Linear Functions from Tables
- Example 2 – Construct Linear Functions from Tables
- Learn – Construct Linear Functions from Verbal Descriptions
- Example 3 – Construct Linear Functions from Verbal Descriptions
- Apply – Depreciation

Module 5 Lesson 4: Compare Functions

Students will compare functions represented in different forms.

- Explore – Compare Properties of Functions
- Example 1 – Compare Two Functions
- Example 2 – Compare Two Functions
- Apply – eBooks

Module 5 Lesson 5: Nonlinear Functions

Students will identify nonlinear functions using tables, graphs, and equations.

- Explore – Linear and Nonlinear Functions
- Learn – Identify Linear and Nonlinear Functions from Graphs
- Examples 1-2 – Identify Linear and Nonlinear Functions from Graphs
- Learn – Identify Linear and Nonlinear Functions from Tables
- Example 3 – Identify Linear and Nonlinear Functions from Tables
- Learn – Identify Linear and Nonlinear Functions from Equations
- Example 4 – Identify Linear and Nonlinear Functions from Equations
- Example 5 – Identify Linear and Nonlinear Functions from Equations
- Apply – Geometry

Module 5 Lesson 6: Qualitative Graphs

Students will analyze and sketch qualitative graphs.

- Explore – Interpret Qualitative Graphs
- Learn – Analyze Qualitative Graphs
- Example 1 – Analyze Qualitative Graphs
- Learn – Sketch Qualitative Graphs
- Example 2 – Sketch Qualitative Graphs
- Example 3 – Sketch Qualitative Graphs with Values

Resources:

- Textbook: McGraw Hill Reveal Math, Course 3
- Student Workbooks: McGraw Hill Reveal Math, Course 3
- Technology: McGraw Hill Online Platform, Teacher 2 in 1 Device, Projector, Student Laptops, Calculators

Unit Modifications for Special Population Students

Advanced Learners	<ul style="list-style-type: none"> - Refer to green BL (Beyond Level) indicators in Teacher Edition and assign corresponding activities: Beyond Level Differentiated Activities, Extension Activities - Use IXL to enhance targeted skills
Struggling Learners	<ul style="list-style-type: none"> - Refer to orange AL (Approaching Level) indicators in Teacher Edition and assign corresponding activities: Remediation Activities, Extra Examples, Arrive Math Take Another Look Mini Lessons - Use IXL to enhance targeted skills
English Language Learners	Refer to purple ELL (English Language Learner) indicators in Teacher Edition and assign corresponding activities
Special Needs Learners	<p>Each special education student has an Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of time: adapting the time allotted for learning, task completion, or testing • Variation of input: adapting the way instruction is delivered • Variation of output: adapting how a student can respond to instruction • Variation of size: adapting the number of items the student is expected to complete • Modifying the content, process, or product
Learners with a 504	Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.

Interdisciplinary Connections

Indicators:

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text

NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone

NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

L.8.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.


Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration, critical thinking, communication, and creativity.

9.3.12.FN.1- Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision making in the finance industry

9.3.ST-SM.2 - *Apply science and mathematic concepts to development of plans, processes and projects that address real world problems*

Unit Title: Geometry	
Unit Description: In this unit, students will use their prior knowledge of angles and triangles to understand special angle pairs and the Pythagorean Theorem . They will use this understanding to find missing angle measures, as well as side lengths of right triangles.	
Unit Duration: 61 days	
Desired Results	
Standard(s): 8.G.A. Understand congruence and similarity using physical models, transparencies, or geometry software 8.G.B. Understand and apply the Pythagorean Theorem 8.G.C. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres	
Indicators: 8.G.A.1. Verify experimentally the properties of rotations, reflections, and translations: a. Lines are transformed to lines, and line segments to line segments of the same length. b. Angles are transformed to angles of the same measure. c. Parallel lines are transformed to parallel lines. 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.3. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. 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 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. 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.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.	
Understandings: <i>Students will understand...</i> <ul style="list-style-type: none"> • That they can use angle relationships to find missing angle measures, when two parallel lines are cut by transversals • The parts of a triangle (sides, vertices, and angles), and how to name them • That the sum of the three interior angle measures of a triangle is 180 degrees • The relationship between an exterior angle and its two remote interior angles of a triangle • That the Pythagorean Theorem describes the relationship between the lengths of the legs and length of the hypotenuse of any right triangle 	Essential Questions: <ol style="list-style-type: none"> 1. How can angle relationships and right triangles be used to solve everyday problems? 2. What is the relationship among the measures of a triangle? 3. How is the measure of a triangle's exterior angle related to the measures of its remote interior angles? 4. What relationship exists among the three sides of a right triangle? 5. How can you prove the Pythagorean Theorem? 6. How can you prove the converse of the Pythagorean Theorem? 7. How can the Pythagorean Theorem be used to find the distance between two points?

<ul style="list-style-type: none"> • What a proof is, and how proofs are used in geometry • How to use the converse of the Pythagorean Theorem to determine if a given triangle is a right triangle • How the Pythagorean Theorem can be used to find the distance between any two points • That transformations map one geometric figure onto another • That translating a figure on the coordinate plane slides to figure in one or two directions • That reflecting a figure on the coordinate plane results in a mirror image of that figure across a line of reflection • How to rotate two-dimensional figures about a vertex on the coordinate plane • How to use coordinate notation to rotate two-dimensional figures on the coordinate plane about the origin • That a dilation is a transformation that can enlarge or reduce a figure proportionally • How to dilate two-dimensional figures on the coordinate plane using coordinate notation • The properties of translations, reflections, and rotations and how these transformations are used to show that a pair of two-dimensional figures is congruent • How the orientation of two congruent figures can be used to identify the sequence of transformations between them • The relationship between the corresponding sides and corresponding angles of two-dimensional congruent figures • How dilations, translations, reflections, and rotations are used to show that a pair of two-dimensional figures is similar • How the sizes of two similar figures are related by the scale factor of the dilation • How corresponding angles and corresponding sides of similar polygons are related • Angle-Angle Similarity • How to find missing measures of sides of similar polygons • How the properties of similar triangles can be used to solve problems involving indirect measurement • How to find the volume of cylinders, cones, and spheres 	<ol style="list-style-type: none"> 8. What does it mean to perform a transformation on a figure? 9. How do the coordinates of a figure change after a translation? 10. How can you determine the coordinates of a figure after a reflection across either axis? 11. How can you determine the coordinates of an image after a 90-degree, 180-degree, and 270-degree clockwise rotation about the origin? 12. How does the scale factor change the size and coordinates of a figure after a dilation relative to the origin? 13. What information is needed to determine if two figures are congruent or similar? 14. What happens to figure when you translate, reflect, or rotate it? 15. What are some properties of similar triangles? 16. What is the relationship between two triangles with two pairs of congruent angles? 17. How can you find lengths that are difficult to measure directly? 18. How can you measure a cylinder, cone, or sphere?
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Assessment Evidence

Performance Tasks:

- Warm-ups
- Exit Tickets
- Reveal Practice Assignments
- GoFormative Assignments
- Quiz: Module 7.1-7.2
- Quiz: Module 7.3-7.4
- Quiz: Module 8.1-8.3
- Quiz: Module 9
- Quiz: Module 10.1-10.3

Other Evidence:

- Independent Work
- Class Discussions
- Online Activities
- Practice and Homework
- Kahoot
- Quizizz
- Quizlet
- Blooket

Benchmarks:

Departmental assessments for Modules 7, 8, 9, and 10 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Plan

Learning Activities:

Module 7 Lesson 1: Angle Relationships and Parallel Lines

Students will examine relationships of angles formed by parallel lines cut by a transversal.

- Launch the Lesson
- Explore – Parallel Lines and Transversals
- Learn – Lines, Angles, and Transversals
- Example 1 – Classify Angle Pairs
- Example 2 – Classify Angle Pairs
- Learn – Find Missing Angle Measures
- Example 3 – Find Missing Angle Measures
- Example 4 – Find Missing Angle Measures
- Apply - Construction

Module 7 Lesson 2: Angle Relationships and Triangles

Students will examine relationships among the angles in a triangle.

- Learn – Triangles
- Explore – Angles of Triangles
- Explore – Exterior Angles of Triangles
- Learn – Angle Sum of Triangles
- Example 1 – Find Missing Angle Measures
- Example 2 – Use ratios to Find Angle Measures
- Learn – Exterior Angles of Triangles
- Example 3 – Find Exterior Angle Measures
- Example 4 – Use Exterior Angles to Find Missing Angle Measures
- Apply - Geometry

Module 7 Lesson 3: The Pythagorean Theorem

Students will solve problems using the Pythagorean Theorem

- Learn – Right Triangles
- Explore – Right Triangle Relationships
- Explore – Proof of the Pythagorean Theorem
- Learn – The Pythagorean Theorem
- Example 1 – Find the Hypotenuse
- Example 2 – Find the Hypotenuse in Three Dimensions
- Example 3 – Find Missing Leg Lengths
- Example 4 – Find Missing Leg Lengths in Three Dimensions
- Apply – Maps
- Learn – Geometric Proof

Module 7 Lesson 4: Converse of the Pythagorean Theorem

Students will solve problems using the converse of the Pythagorean Theorem

- Learn – Converse of the Pythagorean Theorem
- Example 1 – Use the Converse of the Pythagorean Theorem
- Example 2 – Use the Converse of the Pythagorean Theorem
- Explore – Prove the Converse of the Pythagorean Theorem

Module 7 Lesson 5: Distance on the Coordinate Plane

Students will find the distance between two points on the coordinate plane using the Pythagorean Theorem.

- Explore – Use the Pythagorean Theorem to Find Distance
- Learn – Find Distance on the Coordinate Plane
- Example 1 – Find Distance on the Coordinate Plane
- Apply - Maps

Module 8 Lesson 1: Translations

Students will translate figures and describe translations on the coordinate plane.

- Launch the Lesson
- Learn – Transformations
- Learn – Translations on a Coordinate Plane
- Example 1 – Translate Figures on the Coordinate Plane
- Explore – Translate Using Coordinates
- Learn – Translations Using Coordinates
- Example 2 – Translate Using Coordinates
- Example 3 – Use Coordinate Notation to Describe Translations
- Apply – Map Reading

Module 8 Lesson 2: Reflections

Students will reflect figures and describe reflections on the coordinate plane.

- Learn – Reflections on a Coordinate Plane
- Example 1 – Reflect Figures on the Coordinate Plane
- Example 2 – Reflect Figures on the Coordinate Plane
- Explore – Reflect Using Coordinates
- Learn – Reflect Using Coordinates
- Example 3 – Reflect Using Coordinates
- Example 4 – Describe Reflections

Module 8 Lesson 3: Rotations

Students will rotate figures and describe rotations on the coordinate plane.

- Learn – Rotations About a Vertex
- Example 1 – Rotate Figures About a Vertex
- Explore Rotate Using Coordinates
- Learn – Rotations About the Origin
- Example 2 – Rotate Using Coordinates
- Example 3 – Describe Rotations
- Apply – Arranging Furniture

Module 8 Lesson 4: Dilations

Students will dilate figures and describe dilations on the coordinate plane.

- Learn – Dilations and Scale Factor
- Explore – Dilate Figures on the Coordinate Plane
- Learn – Dilations on a Coordinate Plane
- Example 1 – Graph Dilations
- Example 2 – Graph Dilations
- Example 3 – Describe Dilations
- Apply – Consumer Science

Module 9 Lesson 1: Congruence and Transformations

Students will use a sequence of transformations to describe congruency between figures.

- Launch the Lesson
- Explore – Congruence and Transformations
- Learn – Congruence and Transformations
- Example 1 – Determine Congruence
- Example 2 – Determine Congruence
- Learn – Identify Transformations
- Example 3 – Identify Transformations
- Example 4 – Identify Transformations

Module 9 Lesson 2: Congruence and Corresponding Parts

Students will write congruence statements and find missing measures for congruent figures.

- Learn – Corresponding Parts of Congruent Figures
- Example 1 – Write Congruence Statements
- Example 2 – Find Missing Measures
- Apply - Construction

Module 9 Lesson 3: Similarity and Transformations

Students will use a sequence of transformations to describe similarity between figures.

- Learn – Similarity
- Example 1 – Determine Similarity
- Example 2 – Determine Similarity
- Learn – Identify Transformations
- Example 3 – Identify Transformations
- Example 4 – Use the Scale Factor
- Apply - Careers

Module 9 Lesson 4: Similarity and Corresponding Parts

Students will write similarity statements and find missing measures for similar figures.

- Explore – Similar Triangles
- Explore – Angle-Angle Similarity
- Learn – Similar Polygons
- Example 1 – Write Similarity Statements
- Learn – Angle-Angle (AA) Similarity
- Example 2 – Angle-Angle Similarity
- Learn – Similar Polygons and Scale Factor
- Example 3 – Find Missing Measures
- Apply – Fashion Design

Module 9 Lesson 5: Indirect Measurement

Students will solve problems involving similar triangles.

- Explore – Similar Triangles and Indirect Measurement
- Learn – Indirect Measurement
- Example 1 – Use Indirect Measurement
- Example 2 – Use Indirect Measurement

Module 10 Lesson 1: Volume of Cylinders

Students will find the volume of cylinders.

- Launch the Lesson
- Explore – Volume of Cylinders
- Learn – Volume of Cylinders
- Example 1 – Find Volume of Cylinders Given the Radius
- Example 2 – Find Volume of Cylinders Given the Diameter
- Example 3 – Solve Problems Involving the Volume of Cylinders
- Apply - Swimming

Module 10 Lesson 2: Volume of Cones

Students will find the volume of cones.

- Explore – Volume of Cones
- Learn – Volume of Cones
- Example 1 – Find Volume of Cones
- Example 2 – Find Volume of Cones
- Apply - Popcorn

Module 10 Lesson 3: Volume of Spheres

Students will find the volume of spheres and hemispheres.

- Learn – Volume of Spheres
- Example 1 – Find Volume of Spheres
- Example 2 – Find Volume of Spheres
- Example 3 – Find Volume of Spheres
- Learn – Volume of Hemispheres
- Example 4 – Find Volume of Hemispheres
- Apply - Packaging

Module 10 Lesson 4: Find Missing Dimensions

Students will use volume formulas to find missing dimensions in cylinders, cones, and spheres.

- Learn – Find Missing Dimensions Given the Volume
- Example 1 – Find Missing Dimensions of Cylinders
- Example 2 – Find Missing Dimensions of Cones
- Example 3 – Find Missing Dimensions of Spheres
- Apply - Shopping

Module 10 Lesson 5: Volume of Composite Solids

Students will find the volume of composite solids.

- Learn – Composite Solids
- Learn – Volume of Composite Solids
- Example 1 – Find Volume of Composite Solids
- Example 2 – Find Volume of Composite Solids
- Example 3 – Find Volume of Composite Solids
- Apply - Art

Resources:

- Textbook: McGraw Hill Reveal Math, Course 3
- Student Workbooks: McGraw Hill Reveal Math, Course 3
- Technology: McGraw Hill Online Platform, Teacher 2 in 1 Device, Projector, Student Laptops, Calculators
- Graph Paper
- 3-Dimensional Figure Models

Unit Modifications for Special Population Students

Advanced Learners	<ul style="list-style-type: none">- Refer to green BL (Beyond Level) indicators in Teacher Edition and assign corresponding activities: Beyond Level Differentiated Activities, Extension Activities- Use IXL to enhance targeted skills
Struggling Learners	<ul style="list-style-type: none">- Refer to orange AL (Approaching Level) indicators in Teacher Edition and assign corresponding activities: Remediation Activities, Extra Examples, Arrive Math Take Another Look Mini Lessons- Use IXL to enhance targeted skills
English Language Learners	Refer to purple ELL (English Language Learner) indicators in Teacher Edition and assign corresponding activities
Special Needs Learners	Each special education student has an Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include: <ul style="list-style-type: none">• Variation of time: adapting the time allotted for learning, task completion, or testing• Variation of input: adapting the way instruction is delivered• Variation of output: adapting how a student can respond to instruction• Variation of size: adapting the number of items the student is expected to complete• Modifying the content, process, or product
Learners with a 504	Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.

Interdisciplinary Connections

Indicators:

English Language Arts Grade 8

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text

NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone

NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

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NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

L.8.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration, communication, creativity, and critical thinking.

9.3.ST-SM.2 - *Apply science and mathematic concepts to development of plans, processes and projects that address real world problems*

Unit Title: Statistics	
Unit Description: This unit covers topics on scatter plots and two-way frequency and relative frequency tables. Students will make sense of real-world data when the values do not fall into a straight line when graphed, and when different people can draw different conclusions that are all valid. Students should be able to explain conclusions about real-world data through the strategy of modeling.	
Unit Duration: 15 Days	
Desired Results	
Standard(s): 8.SP.A Investigate patterns of association in bivariate data.	
Indicators: 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. 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 (e.g., line of best fit) by judging the closeness of the data points to the line. 8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. <i>For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height..</i> <i>For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height</i> 🌿 Climate Change Example: Students may use the equation of a linear model to interpret the slope when comparing local and global precipitation rates for rainfall in different regions. 8.SP.A.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. <i>For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?</i>	
Understandings: <i>Students will understand...</i> <ul style="list-style-type: none"> • How to construct and interpret scatter plots. • How to informally draw lines that fit a set of data and use them to make conjectures. • How to write equations for lines that fit a set of data and use them to make conjectures. • How to construct two-way tables and find and interpret their relative frequencies. • How to determine if an association exists between categories in two-way tables. 	Essential Questions: <ol style="list-style-type: none"> 1. What do patterns in data mean and how are they used? 2. How can you use a graph to investigate the relationship between two sets of data? 3. How can you use a line to make predictions on a scatter plot? 4. What do relative frequencies tell you about the data in a two-way table?

Assessment Evidence

Performance Tasks:

- Warm-ups
- Exit Tickets
- Reveal Practice Assignments
- GoFormative Assignments
- Quiz: Module 11.1-11.3
- Quiz: Module 11.4-11.5

Other Evidence:

- Independent Work
- Class Discussions
- Online Activities
- Practice and Homework
- Kahoot
- Quizizz
- Quizlet
- Blooket

Benchmarks:

Departmental assessment for Module 11 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Plan

Learning Activities:

Module 11 Lesson 1: Scatter Plots

Students will construct and interpret scatter plots.

- Launch the Lesson
- Explore – Scatter Plots
- Learn – Construct Scatter Plots
- Example 1 – Construct Scatter Plots
- Learn – Interpret Scatter Plots
- Example 2 – Interpret Scatter Plots
- Example 3 – Interpret Scatter Plots
- Apply – Shopping

Module 11 Lesson 2: Draw Lines of Fit

Students will informally draw lines that fit a set of data and use them to make conjectures.

- Explore – Lines of Fit
- Learn – Lines of Fit
- Example 1 – Draw Lines of Fit
- Learn – Make Conjectures Using Lines of Fit
- Example 2 – Make Conjectures Using Lines of Fit

Module 11 Lesson 3: Equations for Lines of Fit

Students will write the equations for lines that fit a set of data and use them to make conjectures.

- Warm-up – Slope, Y-Intercept, Slope Formula, Finding Equations of Lines, Identifying and Interpreting Slope
- Learn – Equations for Lines of Fit
- Example 1 – Equations for Lines of Fit
- Learn – Make Conjectures Using Equations for Lines of Fit
- Example 2 – Make Conjectures Using Equations for Lines of Fit
- Apply – Race Training

Module 11 Lesson 4: Two-Way Tables

Students will construct two-way tables and find and interpret their relative frequencies.

-Warm-Up – writing fraction-decimal-percent equivalencies, understanding ratios, and finding relative frequency

-Learn – Construct Two-Way Tables

-Example 1 – Construct Two-Way Tables

-Learn – Find and Interpret Relative Frequencies in Two-Way Tables

-Example 2 – Find and Interpret Row Relative Frequencies

-Example 3 – Find and Interpret Column Relative Frequencies

Module 11 Lesson 5: Associations in Two-Way Tables

Students will determine if an association exists between categories in two-way tables.

-Explore – Patterns of Association in Two-Way Tables

-Learn – Associations in Two-Way Tables

-Example 1 – Use Row Relative Frequencies to Determine Associations

-Example 2 – Use Column Relative Frequencies to Determine Associations

-Apply – Jobs

Resources:

- Textbook: McGraw Hill Reveal Math, Course 3
- Student Workbooks: McGraw Hill Reveal Math, Course 3
- Technology: McGraw Hill Online Platform, Teacher 2 in 1 Device, Projector, Student Laptops, Calculators
- Graph Paper

Unit Modifications for Special Population Students	
Advanced Learners	<ul style="list-style-type: none"> - Refer to green BL (Beyond Level) indicators in Teacher Edition and assign corresponding activities: Beyond Level Differentiated Activities, Extension Activities - Use IXL to enhance targeted skills
Struggling Learners	<ul style="list-style-type: none"> - Refer to orange AL (Approaching Level) indicators in Teacher Edition and assign corresponding activities: Remediation Activities, Extra Examples, Arrive Math Take Another Look Mini Lessons - Use IXL to enhance targeted skills
English Language Learners	Refer to purple ELL (English Language Learner) indicators in Teacher Edition and assign corresponding activities
Special Needs Learners	Each special education student has an Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include: <ul style="list-style-type: none"> • Variation of time: adapting the time allotted for learning, task completion, or testing • Variation of input: adapting the way instruction is delivered • Variation of output: adapting how a student can respond to instruction • Variation of size: adapting the number of items the student is expected to complete • Modifying the content, process, or product
Learners with a 504	Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.

Interdisciplinary Connections

Indicators:

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text

NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone

NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

L.8.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration, creativity, and critical thinking.

9.3.ST.2- *Use technology to acquire, manipulate, analyze and report data*

9.3.ST-SM.2 - *Apply science and mathematic concepts to development of plans, processes and projects that address real world problems*

9.3.ST-SM.4 - *Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.*

9.4.TL.1 - *Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data based decision- making.*