NEPTUNE CITY SCHOOL DISTRICT

Mathematics Curriculum Grade 8



NEPTUNE CITY SCHOOL DISTRICT

Office of the Chief School Administrator, Principal 210 West Sylvania Avenue Neptune City, NJ 07753

The Neptune City School District is appreciative and proud to accept and align the curriculum of the Neptune Township School District to properly prepare the Neptune City students for successful integration into the Neptune Township High School Educational Program.

(August 2024)

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SCHOOL DISTRICT MISSION STATEMENT

The Neptune City School District, in partnership with the parents and the community, will support and sustain an excellent system of learning, promote pride in diversity, and expect all students to achieve the New Jersey Student Learning Standards at all grade levels to become responsible and productive citizens.

NEPTUNE CITY SCHOOL DISTRICT

MATHEMATICS CURRICULUM GRADE 8

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NEPTUNE TOWNSHIP SCHOOL DISTRICT

MATHEMATICS - GRADE 8 CURRICULUM

Acknowledgements

The Mathematics Curriculum guide for grade 8 was developed for Neptune City School District through the efforts of Tracy Whitt in cooperation with Curriculum Steering Committee members Dr. Raymond J. Boccuti, Katherine Porter, Susan Tonzola, and Leigh White

The Mathematics Curriculum Guide is designed to align with the New Jersey Student Learning Standards for Mathematics, reflecting the heightened discipline these standards bring to education. This guide emphasizes problem-solving skills as well as activity based learning, moving beyond facts and skills. We aim for this guide to be a useful tool for the educators teaching this course and welcome their suggestions for future enhancements.

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NEPTUNE CITY SCHOOL DISTRICT

DISTRICT MISSION STATEMENT

The primary mission of the Neptune Township School District is to prepare students for a life-long learning process in a complex and diverse world. It is with high expectations that our schools foster:

- A strong foundation in academic and modern technologies.
- A positive and varied approach to teaching and learning.
- An emphasis on critical thinking skills and problem-solving techniques.
- A respect for and an appreciation of our world, its resources, and its people.
- A sense of responsibility, good citizenship, and accountability.
- An involvement by the parents and the community in the learning process.

Neptune City School District

Educational Outcome Goals

The students in the Neptune City school district will become life-long learners and will:

- Develop fluency in reading, writing, speaking, listening, and viewing, coupled with strong comprehension and critical thinking abilities.
- Attain the mathematical competencies, insights, and mindsets essential for thriving in professional and daily life.
- Master core scientific concepts, enhance analytical thinking, and practice safety, critical inquiry, and open-mindedness when gathering, evaluating, and interpreting data.
- Achieve technological literacy.
- Demonstrate proficiency in all New Jersey Student Learning Standards (NJSLS).
- Cultivate the capability to comprehend their surroundings and value America's heritage, achieving strong literacy in civics, history, economics, and geography.
- Foster an appreciation for diverse cultures and exhibit integrity, accountability, fairness, compassion, and civic engagement.
- Achieve cultural literacy by understanding the historical, societal, and multicultural dimensions and impacts of the arts.
- Show proficiency in decision-making, setting goals, and communicating effectively, emphasizing the development of character.Understand and practice the skills of family living, health, wellness and safety for their physical, mental, emotional, and social development.
- Acquire the essential consumer, family, and life skills needed to contribute effectively to society.
- Cultivate the capacity for creative and innovative decision-making, along with proficiency in expressing ideas, thoughts, and emotions.
- Foster an understanding of career paths and acquire crucial technical and workplace skills essential for various aspects of life and professional endeavors.

MATHEMATICS - GRADE 8 CURRICULUM

COURSE DESCRIPTION

In Grade 8 Mathematics, the students will embark on a comprehensive journey through key concepts of algebra, geometry, and data analysis. The course begins with a deep dive into real numbers, where students will explore the properties and operations of integers, fractions, and decimals, laying the foundation for understanding complex equations and functions. As they progress, students will analyze and solve linear equations and inequalities, learning how to model real-world scenarios and solve problems using algebraic methods. Functions will be used to describe relationships between quantities, and students will investigate bivariate data to uncover patterns and trends.

The curriculum also emphasizes geometric concepts, including congruence and similarity, where students will explore transformations and their effects on shapes. The Pythagorean Theorem will be studied to solve problems related to right triangles, and students will apply their knowledge to calculate surface area and volume for various three-dimensional figures. Additionally, the course will cover systems of linear equations, helping students to solve and interpret multiple equations simultaneously. This integrated approach prepares students to tackle complex mathematical problems and apply their skills in practical contexts.

INTEGRATED SOCIAL AND EMOTIONAL LEARNING COMPETENCIES

The following social and emotional competencies are integrated in this curriculum document:

Self-	Self-Awareness	
	Recognize one's own feelings and thoughts	
	Recognize the impact of one's feelings and thoughts on one's own behavior	
X	Recognize one's personal traits, strengths and limitations	
X	Recognize the importance of self-confidence in handling daily tasks and challenges	
Self-	Management	
	Understand and practice strategies for managing one's own emotions, thoughts and behaviors	
X	Recognize the skills needed to establish and achieve personal and educational goals	
X	Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals	
Socia	al Awareness	
	Recognize and identify the thoughts, feelings, and perspectives of others	
	Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds	
X	Demonstrate an understanding of the need for mutual respect when viewpoints differ	
X	Demonstrate an awareness of the expectations for social interactions in a variety of setting	
Resp	oonsible Decision Making	
X	Develop, implement and model effective problem solving and critical thinking skill	
X	Identify the consequences associated with one's action in order to make constructive choices	
	Evaluate personal, ethical, safety and civic impact of decisions	
Relationship Skills		
X	Establish and maintain healthy relationships	
X	Utilize positive communication and social skills to interact effectively with others	
X	Identify ways to resist inappropriate social pressure	
X	Demonstrate the ability to present and resolve interpersonal conflicts in constructive ways	
X	Identify who, when, where, or how to seek help for oneself or others when needed	

Topic 1	Real Numbers
Suggested Time Frame	20 Days

Overview / Rationale

This unit focuses on deepening students' understanding of the real number system, including both rational and irrational numbers. Students will explore how to represent repeating decimals as fractions and how to distinguish between rational and irrational numbers. The unit emphasizes the importance of comparing and ordering these numbers, as well as understanding and evaluating square and cube roots.

Additionally, students will build a strong foundation in exponent rules, including properties of integer exponents, zero exponents, and negative exponents. These skills are crucial for simplifying expressions and solving equations. The unit also introduces scientific notation as a tool for working with very large or very small numbers, emphasizing its practical applications in estimating and performing calculations. By mastering these concepts, students will be equipped to handle more complex mathematical problems and understand the connections between different types of numbers and operations.

STAGE 1: Desired Results

New Jersey Student Learning Standards for Mathematics

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

8.EE.A.2- Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

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

8.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.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., $\pi 2$).		
Applied Standards for Mathematical Practice		
• 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.

Essential Questions	Enduring Understandings
	Students will understand
-How can you write repeating decimals as fractions?	-Rational numbers as decimals
-How is an irrational number different from a	-Irrational numbers
rational number?	-Comparing and ordering real numbers
-How can you compare and order rational and irrational numbers?	-Evaluating square roots and cube roots
-How do you evaluate cube roots and square	-Solving equations using square roots and cube roots
-How can you solve equations with squares and	-The use of properties of integer exponents
cubes?	-The use of more properties of integer exponents
-How do properties of integer exponents help you write equivalent expressions?	-The use of powers of 10 to estimate quantities Scientific Notation
-What do the Zero Exponent and Negative Exponent Properties mean?	-Operations with numbers in Scientific Notation
-When would you use a power of 10 to estimate a quantity?	

Learning Targets: Knowledge Students will knowLearning Targets: Skills Students will be able toUnderstanding how repeating decimals can be expressed as fractionsWriting repeating decimals as fractionsRecognizing the difference between rational and irrational numbersWriting repeating decimals as fractionsKnowing how to compare and order rational and irrational numbers on a number lineValuating square roots and cube rootsComprehending the process of evaluating square roots and cube rootsSolving equations that involve squares and cubesUnderstanding how to solve equations involving squares and cubesUnderstanding how to solve equations involving squares and cubesUnderstanding the Zero Exponent and Negative -Understanding the Zero Exponent and Negative -Exponent Properties and their applicationsConverting numbers to and from scientific notationUnderstanding the Zero Exponent and Negative -Exponent Properties and their applicationsPerforming arithmetic operations with numbers in scientific notation.	-What is scientific notation and why is it used? -How does using scientific notation help when computing with very large or very small numbers?	
 -Understanding how repeating decimals can be expressed as fractions. -Recognizing the difference between rational and irrational numbers. -Knowing how to compare and order rational and irrational numbers on a number line. -Comprehending the process of evaluating square roots and cube roots. -Comprehending the process of evaluating square roots and cube roots. -Understanding how to solve equations involving squares and cubes. -Grasping the properties of integer exponents and how they can be used to simplify expressions. -Understanding the Zero Exponent and Negative -Exponent Properties and their applications. -Knowing how to use powers of 10 to estimate large or small quantities. -Writing repeating decimals as fractions. -Writing repeating decimals as fractions. -Comparing and ordering rational and irrational numbers. -Evaluating square roots and cube roots. -Solving equations that involve squares and cubes. -Applying properties of integer exponents to write equivalent expressions. -Using the Zero Exponent and Negative -Performing arithmetic operations with numbers in scientific notation. 	Learning Targets: Knowledge Students will know	Learning Targets: Skills Students will be able to
 -Understanding the concept and purpose of scientific notation. -Recognizing how to perform operations with numbers in scientific notation. 	 -Understanding how repeating decimals can be expressed as fractions. -Recognizing the difference between rational and irrational numbers. -Knowing how to compare and order rational and irrational numbers on a number line. -Comprehending the process of evaluating square roots and cube roots. -Understanding how to solve equations involving squares and cubes. -Grasping the properties of integer exponents and how they can be used to simplify expressions. -Understanding the Zero Exponent and Negative -Exponent Properties and their applications. -Knowing how to use powers of 10 to estimate large or small quantities. -Understanding the concept and purpose of scientific notation. -Recognizing how to perform operations with numbers in scientific notation. 	 Writing repeating decimals as fractions. -Comparing and ordering rational and irrational numbers. -Evaluating square roots and cube roots. -Solving equations that involve squares and cubes. -Applying properties of integer exponents to write equivalent expressions. -Using the Zero Exponent and Negative Exponent Properties to simplify expressions. -Estimating quantities using powers of 10. -Converting numbers to and from scientific notation. -Performing arithmetic operations with numbers in scientific notation.

Key Academic Vocabulary	
Review:	New:
Fraction	Cube root
Integer	Irrational Number
Repeating decimal	Negative Exponent Property
Terminating decimal	Perfect cube
	Perfect square
	Power of Powers Property
	Power of Products Property
	Product of Powers Property
	Quotient of Powers Property
	Scientific Notation
	Square root
	Zero Exponent Property

New Jersey Student Learning Standards for English Language Arts

- **RI.6.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.
- W.1 Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence.

2020 New Jersey Student Learning Standards for Computer Science and Design Thinking NJSLS 8.1 Computer Science

- **8.1.8.IN.1:** Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination.
- **8.1.12.AP.6:** Refine a solution that meets users' needs by incorporating feedback from team members and users.

NJSLS 8.2 Design Thinking

- **8.2.8.ED.6:** Analyze how trade-offs can impact the design of a product.
- **8.2.8.ED.3:** Develop a proposal for a solution to a real-world problem that includes a model.

Student Resources

Texts: Savvas Envision Mathematics Common Core 2021

Resources: <u>Student's Edition</u>

- Review What You Know
- Language Development Activity
- Mid-topic checkpoint and Performance Task
- Topic Review
- Pick a Project

Websites:

- <u>http://www.hmhco.com</u>
- <u>http://khanacademy.org</u>

Integrated Technology

- Google Suite: Docs, Sheets, Slides, Forms
- Devices:
 - Chromebooks
 - Texas Instruments (TI-30X Calculators)

Teacher Resources

Texts: Savvas Envision Mathematics Common Core 2021

Resources:

- Google Suite: Docs, Sheets, Slides, Forms
- Devices: Chromebooks

Websites:

- <u>http://www.hmhco.com</u> Into Math Ed, Your Friend in Learning
- <u>http://www.kutasoftware.com</u> Test and worksheet generator for teachers
- <u>http://khanacademy.org</u> Tutorials on individual lessons

Stage 2 – Assessment Evidence

Performance Task(s):

Learning Activities:

ACT Math: Hard Working Organs Pick a Project: Write a Poem, Design a Tiny House, Plan a Tour of the Milky Way, or Tell a Folk Story Stem Project: Going, Going, Gone?

Pre-Assessments:

Gr 6 Math *LinkIt*! NJSLS Form A Topic Readiness Assessment Grade 6 Readiness Test

Formative Assessments: IXL LinkIt Mid Topic Checkpoint Review and Fluency Practice

Exit tickets

Summative Assessments: Quizzes Tests

Benchmark: Cumulative Final with multiple choice, short answer, and ECR

Alternative:

Quizizz Kahoot Cool Math Games NJCTL Quizzes Kuta Software

Stage 3 – Learning Plan

Learning Mindset: Sustainability and Systems Thinking Mindset

Topic Opener:

- Topic 1: Going, Going, Gone
- Diagnostic Assessment: Get Ready!

Topic 1:

- Lesson 1.1: Rational Numbers as Decimals
- Lesson 1.2: Understand Irrational Numbers
- Lesson 1.3: Compare and Order Real Numbers
- Lesson 1.4: Evaluate Square Roots and Cube Roots
- Lesson 1.5: Solve equations Using Square Roots and Cube Roots
- Lesson 1.6: Use Properties of Integer Exponents
- Lesson 1.7: More Properties of Integer Exponents
- Lesson 1.8: Use Powers of 10 to Estimate Quantities
- Lesson 1.9: Understand Scientific Notation
- Lesson 1.10: Operations with Numbers in Scientific Notatation

Topic 2	Analyze and Solve Linear Equations
Suggested Time Frame	25 Days

STAGE 1: Desired Results

Overview/Rational:

This unit focuses on developing a deep understanding of linear equations and proportional relationships, essential for solving real-world problems and analyzing mathematical models. Students will learn how to solve equations involving like-terms, variables on both sides, and multiple steps, using properties such as the Distributive Property. These skills are fundamental in algebra and provide a foundation for tackling more complex mathematical concepts.

The unit also explores the concept of slope and its role in representing proportional relationships. By analyzing how slope and the y-intercept interact in linear equations, students will gain insights into the behavior of linear functions and their graphical representations. Understanding these principles will enable students to compare different types of relationships, solve equations with various solutions, and apply these concepts to real-world scenarios, such as modeling population growth or interpreting trends. Through this unit, students will develop critical thinking and problem-solving skills that are applicable across a range of mathematical and practical contexts.

New Jersey Student Learning Standards for Mathematics

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

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

8.EE.C.7a- Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).

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

Applied Standards for Mathematical Practice

- 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.

Essential Questions	Enduring Understandings Students will understand
-How do you solve equations that contain like terms?	-Combining like terms to solve equations
How do you use inverse energians to solve	-Solving equations with variables on both sides
equations with variables on both sides?	-Solving multi-step equations
-How can you use the Distributive Property to solve multi-step equations?	-Equations with no solutions or infinitely many solutions
-Will a one-variable equation always have only one solution?	-Comparing proportional relationships
-How can you compare proportional	-Connecting proportional relationships and slope
relationships represented in different ways?	-Analyzing linear equations
-What is slope?	-Understanding the y=Mx
-How does slope relate to the equation for a proportional relationship?	-Understanding the y-intercept of a line
	-Analyzing linear equations y=mx+b
-What is the y-intercept and what does it indicate?	
-What is the equation of a line for a non-proportional relationship?	
Learning Targets: Knowledge Students will know	Learning Targets: Skills Students will be able to
-Combining like terms to solve equations	-Combine like terms to simplify and solve
-Solving equations with variables on both sides	equations
using inverse operations	-Solve equations with variables on both sides using
-Using the Distributive Property to solve multi-step equations	inverse operations -Apply the Distributive Property to solve multi-step
	equations
-Understanding that one-variable equations can have one solution, no solution, or infinitely many solutions	-Determine whether a one-variable equation has one solution, no solution, or infinitely many solutions

-Comparing proportional relationships represented in different formats (tables, graphs, and equations)	-Compare proportional relationships using tables, graphs, and equations
-Understanding slope as a measure of the steepness of a line and its relation to the rate of change	 -Calculate and interpret the slope of a line -Write and interpret equations for proportional relationships (y = mx)
-Relating slope to the equation of a proportional relationship $(y = mx)$	-Identify and analyze the y-intercept in linear
-Recognizing the y-intercept as the point where a line crosses the y-axis and its significance in linear relationships	equations -Write and solve equations of lines in the form y = mx + b for non-proportional relationships
-Knowing the equation of a line for non-proportional relationships, represented as $y = mx + b$	

Key Academic Vocabulary		
Review:	New:	
Inverse operations	Slope of a line	
Like terms	Slope-intercept form	
Proportion	Y-intercept	
Variables		

Interdisciplinary Connections

New Jersey Student Learning Standards for English Language Arts

- **R.1** Read closely to determine what the text says as explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
- **R.4** 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.
- W.1 Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence.

2020 New Jersey Student Learning Standards for Computer Science and Design Thinking NJSLS 8.1 Computer Science

- **8.1.8.NI.1:** Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination.
- **8.1.8.NI.2:** Model the role of protocols in transmitting data across networks and the Internet and how they enable secure and errorless communication.
- **8.1.8.NI.4:** Explain how new security measures have been created in response to key malware events.
- **8.1.8.IC.1:** Compare the trade-offs associated with computing technologies that affect individual's everyday activities and career options.
- **8.1.8.IC.2:** Describe issues of bias and accessibility in the design of existing technologies.
- **8.1.8.DA.1:** Organize and transform data collected using computational tools to make it usable for a specific purpose.

NJSLS 8.2 Design Thinking

- **8.2.8.ED.1:** Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer
- **8.2.8.ED.6:** Analyze how trade-offs can impact the design of a product.
- **8.2.8.ITH.2:** Compare how technologies have influenced society over time.
- **8.2.8.ITH.5:** Compare the impacts of a given technology on different societies, noting factors that may make a technology appropriate and sustainable in one society but not in another.

Student Resources		
Texts: Savvas Envision Mathematics Common Core 2021		
 Resources: <u>Student's Edition</u> Review What You Know Language Development Activity Mid-topic checkpoint and Performance Task Topic Review Pick a Project 		
Websites: • <u>http://www.hmhco.com</u> • <u>http://khanacademy.org</u>		
 Integrated Technology Google Suite: Docs, Sheets, Slides, Forms Devices: Chromebooks Texas Instruments (TI-30X Calculators) 		
Teacher Resources		
Texts: Savvas Envision Mathematics Common Core 2021		
Resources:		
Google Suite: Docs, Sheets, Slides, FormsDevices: Chromebooks		
 Websites: <u>http://www.hmhco.com</u> Into Math – Ed, Your Friend in Learning <u>http://www.kutasoftware.com</u> Test and worksheet generator for teachers <u>http://khanacademy.org</u> Tutorials on individual lessons 		

Stage 2 – Assessment Evidence

Performance Task(s):

Learning Activities: ACT Math: Powering Down Pick a Project: Design an Escape Room Adventure, Plan a Pet Care, Write a Play, or Graph a Walking Pattern Stem Project: Modeling Population Growth

Pre-Assessments:

Gr 6 Math *LinkIt*! NJSLS Form A Topic Readiness Assessment Grade 6 Readiness Test

Formative Assessments: IXL

LinkIt Mid Topic Checkpoint Review and Fluency Practice Exit tickets

Summative Assessments:

Quizzes Tests

Benchmark: Cumulative Final with multiple choice, short answer, and ECR

Alternative:

Quizizz Kahoot Cool Math Games NJCTL Quizzes Kuta Software

Stage 3 – Learning Plan

Learning Mindset: Analytical Thinking

Topic Opener:

- Topic 2: Modeling Population Growth
- Diagnostic Assessment: Get Ready!

Topic 2:

- Lesson 2.1: Combine Like Terms to Solve Equations
- Lesson 2.2: Solve Equations with Variables on Both Sides
- Lesson 2.3: Solve Multistep Equations
- Lesson 2.4: Equations with No Solutions or Infinitely Many Solutions
- Lesson 2.5: Compare Proportional Relationships
- Lesson 2.6: Connect Proportional Relationships and Slope
- Lesson 2.7: Analyze Linear Equations
- Lesson 2.8: Understand the y-Intercept of a Line
- Lesson 2.9: Analyze Linear Equations

Торіс З	Use Functions To Model Relationships
Suggested Time Frame	15 Days

Overview / Rationale

This unit focuses on understanding and analyzing functions, a fundamental concept in mathematics that is crucial for modeling and interpreting real-world relationships. Students will explore the criteria for determining whether a relation is a function, emphasizing the importance of unique mappings between inputs and outputs. The unit will cover various ways to represent functions, including tables, graphs, and equations, enabling students to connect and compare these representations effectively.

Students will learn how to use functions to represent linear relationships and how to interpret qualitative graphs to describe relationships between quantities. By analyzing functions, students will gain insights into how linear and nonlinear functions behave and will practice constructing functions to model real-world scenarios. This unit also emphasizes the importance of sketching graphs from verbal descriptions and understanding intervals of increase and decrease, which are essential skills for visualizing and interpreting function behavior. Overall, this unit aims to provide students with a comprehensive understanding of functions and their applications, preparing them for more advanced mathematical concepts and real-world problem-solving.

STAGE 1: Desired Results

New Jersey Student Learning Standards for Mathematics

8.F.A.1-Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.

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

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

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

8.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.

Applied Standards for Mathematical Practice

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Attend to precision.
- Look for and make use of structure.

Essential Questions	Enduring Understandings Students will understand
-When is a relation a function?	-Relations and Functions
-What are different representations of a function?	-Connecting representations of functions
-How can you compare two functions?	-Comparing linear and nonlinear functions
-How can you use a function to represent a linear relationship?	-Constructing functions to model linear relationships
-How does a qualitative graph describe the relationship between quantities?	-Intervals of increase and decrease
-How does the sketch of a graph of a function help describe its behavior?	-Sketching functions from verbal descriptions
Learning Targets: Knowledge Students will know	Learning Targets: Skills Students will be able to

-Identifying whether a relation is a function using various methods (e.g., vertical line test)
-Representing functions in different forms (e.g., graphical, tabular, algebraic)
-Comparing and contrasting two functions using their representations
-
-Constructing and using functions to model
linear relationships in real-world contexts
-Analyzing qualitative graphs to determine the
nature of relationships between variables
-Sketching accurate graphs of functions based on verbal descriptions and interpreting their behavior

Key Academic Vocabulary		
Review:	New:	
Linear equation	Constant rate of change	
Proportional relationship	Function	
Slope	Initial Value	
Slope-intercept form	Interval	
Y-intercept	Linear function	
	Nonlinear function	
	Qualitative graph	
	Relation	

Interdisciplinary Connections

New Jersey Student Learning Standards for English Language Arts

- **RI.6.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.
- **RI.6.7.** Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

2020 New Jersey Student Learning Standards for Computer Science and Design Thinking NJSLS 8.1 Computer Science

- **8.1.8.DA.1:** Organize and transform data collected using computational tools to make it usable for a specific purpose.
- **8.1.12.AP.6:** Refine a solution that meets users' needs by incorporating feedback from team members and users.

Student Resources

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Resources: <u>Student's Edition</u>

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- <u>http://khanacademy.org</u>

Integrated Technology

- Google Suite: Docs, Sheets, Slides, Forms
- Devices:
 - Chromebooks
 - Texas Instruments (TI-30X Calculators)

Teacher Resources

Texts: Savvas Envision Mathematics Common Core 2021

Resources:

- Google Suite: Docs, Sheets, Slides, Forms
- Devices: Chromebooks

Websites:

- <u>http://www.hmhco.com</u> Into Math Ed, Your Friend in Learning
- <u>http://www.kutasoftware.com</u> Test and worksheet generator for teachers
- <u>http://khanacademy.org</u> Tutorials on individual lessons

Stage 2 – Assessment Evidence

Performance Task(s):

Learning Activities: ACT Math: Every Drop Counts Pick a Project: Build a Rube Goldberg Machine, Make a Math Card Game, Plan a Maintenance Route, or Design a Video Game Element Stem Project: Modeling Population Growth

Pre-Assessments:

Gr 6 Math *LinkIt*! NJSLS Form A Topic Readiness Assessment Grade 6 Readiness Test

Formative Assessments:

IXL LinkIt Mid Topic Checkpoint Review and Fluency Practice Exit tickets

Summative Assessments:

Quizzes Tests

Benchmark: Cumulative Final with multiple choice, short answer, and ECR

Alternative:

Quizizz Kahoot Cool Math Games NJCTL Quizzes Kuta Software

Stage 3 – Learning Plan

Learning Mindset: Critical Analysis and Adaptability

Topic Opener:

- Topic 3: Modeling Population Growth
- Diagnostic Assessment: Get Ready!

Topic 3:

- Lesson 3.1: Understand Relations and Functions
- Lesson 3.2: Connect Representations of Functions
- Lesson 3.3: Compare Linear and Nonlinear Functions
- Lesson 3.4: Construct Functions to Model Linear Relationships
- Lesson 3.5: Intervals of Increase and Decrease
- Lesson 3.6: Sketch Functions from Verbal Descriptions

Торіс 4	Investigate Bivariate Data
Suggested Time Frame	25 Days

Overview / Rationale

In this unit, students will explore methods for analyzing and interpreting relationships between paired data using various statistical tools. The focus will be on understanding how scatter plots and linear models can be utilized to represent and predict data relationships, and how two-way frequency tables, including their relative forms, can reveal connections between categorical data sets. By examining these tools, students will learn to identify patterns, describe associations, and make informed predictions based on data trends. This unit aims to build foundational skills in data analysis and visualization, preparing students to interpret real-world data and apply statistical reasoning in diverse contexts.

STAGE 1: Desired Results

New Jersey Student Learning Standards for Mathematics

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

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

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

8.SP.A.2- Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (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.

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.

Applied Standards for Mathematical Practice

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

Essential Questions	Enduring Understandings	
Essential Questions		
	Students will understand	
-How does a scatter plot show the relationship	-Constructing and interpreting scatter plots	
between paired data?		
1	-Analyzing linear associations	
	-Anaryzing micar associations	
-How can you describe the association of two		
data sets?	-Using linear models to make predictions	
-How do linear models help you to make a	-Interpreting two-way frequency tables	
modiation?	interpreting two way nequency acres	
prediction?		
	-Interpreting two-way relative frequency tables	
-How does a two-way frequency table show the		
relationships between sets of paired data?		
-what is the advantage of a two-way relative		
frequency table for showing relationships		
between sets of paired data?		
-		
Learning Targets: Knowledge	Learning Targets: Skills	
Students will know	Students will be able to	
Understand have gentler plats illustrate the		
-Onderstand now scatter plots infustrate the	Construct scatter plots to represent paired data	
relationship between paired data.	visually	
	visually.	
-Recognize patterns, trends, and correlations in	Analyza souttor plats to identify and describe the	
scatter plots.	-Analyze scaller plots to identify and describe the	
	type and strength of the relationship between	
-Describe the type (positive, negative, or no	variables.	
correlation) and strength of the association		
between two data sets.		
Key Academic Vocabulary		
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Review:	New:	
Ratio	Categorical data	
Slope	Cluster	
X-axis	Gap	
Y-axis	Measurement data	
	Negative association	
	Outlier	
	Positive association	
	Relative frequency table	
	Scatter plot	
	Trend line	

Interdisciplinary Connections

New Jersey Student Learning Standards for English Language Arts

- **R.I.6.7.** Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.
- W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

2020 New Jersey Student Learning Standards for Computer Science and Design Thinking NJSLS 8.1 Computer Science

- **8.1.8.NI.1:** Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination.
- **8.1.8.NI.2:** Model the role of protocols in transmitting data across networks and the Internet and how they enable secure and errorless communication.
- **8.1.8.NI.4:** Explain how new security measures have been created in response to key malware events.
- **8.1.8.IC.1:** Compare the trade-offs associated with computing technologies that affect individual's everyday activities and career options.
- **8.1.8.IC.2:** Describe issues of bias and accessibility in the design of existing technologies.
- **8.1.8.DA.1:** Organize and transform data collected using computational tools to make it usable for a specific purpose.

NJSLS 8.2 Design Thinking

- **8.2.8.ED.1:** Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer
- **8.2.8.ED.6:** Analyze how trade-offs can impact the design of a product.
- 8.2.8.ITH.2: Compare how technologies have influenced society over time.

• **8.2.8.ITH.5:** Compare the impacts of a given technology on different societies, noting factors that may make a technology appropriate and sustainable in one society but not in another.

Student Resources

Texts: Savvas Envision Mathematics Common Core 2021

Resources: <u>Student's Edition</u>

- Review What You Know
- Language Development Activity
- Mid-topic checkpoint and Performance Task
- Topic Review
- Pick a Project

Websites:

- <u>http://www.hmhco.com</u>
- <u>http://khanacademy.org</u>

Integrated Technology

- Google Suite: Docs, Sheets, Slides, Forms
- Devices:
 - Chromebooks
 - Texas Instruments (TI-30X Calculators)

Teacher Resources

Texts: Savvas Envision Mathematics Common Core 2021

Resources:

- Google Suite: Docs, Sheets, Slides, Forms
- Devices: Chromebooks

Websites:

- <u>http://www.hmhco.com</u> Into Math Ed, Your Friend in Learning
- <u>http://www.kutasoftware.com</u> Test and worksheet generator for teachers
- <u>http://khanacademy.org</u> Tutorials on individual lessons

Stage 2 – Assessment Evidence

Performance Task(s):

Learning Activities: ACT Math: Reach Out Pick a Project: Build a Carnival Game, Summarize Superhero Data, Write a Song, or Research a Career Stem Project: How Many Fish

Pre-Assessments:

Gr 6 Math *LinkIt*! NJSLS Form A Topic Readiness Assessment Grade 6 Readiness Test

Formative Assessments:

IXL LinkIt Mid Topic Checkpoint Review and Fluency Practice Exit tickets

Summative Assessments:

Quizzes Tests

Benchmark: Cumulative Final with multiple choice, short answer, and ECR

Alternative:

Quizizz Kahoot Cool Math Games NJCTL Quizzes Kuta Software

Stage 3 – Learning Plan

Learning Mindset: Scientific Inquiry

Topic Opener:

- Topic 4: How Many Fish?
- **Diagnostic Assessment:** *Get Ready!*

Topic 4:

- Lesson 4.1: Construct and Interpret Scatter Plots
- Lesson 4.2: Analyze Linear Associations
- Lesson 4.3: Use Linear Models to Make Predictions
- Lesson 4.4: Interpret Two-Way Frequency Tables
- Lesson 4.5: Interpret Two-Way Relative Frequency Tables

Topic 5	Analyze and Solve Systems of Linear Equations
Suggested Time Frame	20 Days

Overview / Rationale

This unit focuses on developing students' understanding and ability to solve systems of linear equations using various methods, including graphing, substitution, and elimination. By exploring the relationship between slopes, y-intercepts, and the solutions of linear equations, students will gain a deeper comprehension of how linear systems function and how their solutions can be represented graphically.

The rationale behind this unit is to equip students with the skills necessary to analyze and solve real-world problems that can be modeled using linear systems. Understanding the different methods to solve these systems not only enhances their algebraic fluency but also prepares them for more complex mathematical concepts in future studies. Through this unit, students will build a foundation that is crucial for advanced problem-solving in mathematics, science, and various fields that require analytical reasoning.

STAGE 1: Desired Results

New Jersey Student Learning Standards for Mathematics

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

8.EE.C.8a-Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

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

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

8F.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.SPA.3-Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.

•		

Enduring Understandings Students will understand
-Estimating solutions by inspection
-Solving systems by graphing
-Solving systems by substitution
-Solving systems by elimination
]

-How are the properties of equality used to solve systems of linear equations?	
Learning Targets: Knowledge Students will know	Learning Targets: Skills Students will be able to
-Understand how slopes and y-intercepts are related to the number of solutions of linear equations.	-Accurately estimate solutions of systems of linear equations by inspection.
-Recognize how the graph of a system of linear	-Solve systems of linear equations by graphing.
equations represents its solution.	-Apply the substitution method to solve systems of
-Identify when substitution is a useful method for solving systems of equations	linear equations.
Comment of the and the analysis of a multicome	-Use the elimination method to solve systems of linear equations.
used to solve systems of linear equations.	-Analyze the relationship between the slopes and
-Demonstrate an understanding of estimating solutions by inspection.	y-intercepts of linear equations to determine the number of solutions.
-Understand the process of solving systems by graphing.	-Interpret the graphical representation of systems of linear equations to identify solutions.
-Comprehend the method of solving systems by substitution.	-Select and apply the most appropriate method (graphing, substitution, or elimination) to solve a given system of linear equations.
-Understand the method of solving systems by elimination.	

Key Academic Vocabulary		
Review:	New:	
Linear equation	Solution of a system of linear equations	
Parallel	System of linear equations	
Slope		
Y-intercept		
1		

Interdisciplinary Connections

New Jersey Student Learning Standards for English Language Arts

- **R7.** Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
- W7. Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.
- **W9.** Draw evidence from literary or informational texts to support analysis, reflection, and research.

2020 New Jersey Student Learning Standards for Computer Science and Design Thinking NJSLS 8.1 Computer Science

- **8.1.8.NI.1:** Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination.
- **8.1.8.NI.2:** Model the role of protocols in transmitting data across networks and the Internet and how they enable secure and errorless communication.
- **8.1.8.NI.4:** Explain how new security measures have been created in response to key malware events.
- **8.1.8.IC.2:** Describe issues of bias and accessibility in the design of existing technologies.
- **8.1.8.DA.1:** Organize and transform data collected using computational tools to make it usable for a specific purpose.

NJSLS 8.2 Design Thinking

- **8.2.8.ED.1:** Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer
- **8.2.8.ITH.2:** Compare how technologies have influenced society over time.
- **8.2.8.WITH.5:** Compare the impacts of a given technology on different societies, noting factors that may make a technology appropriate and sustainable in one society but not in another.

Student Resources

Texts: Savvas Envision Mathematics Common Core 2021

Resources: <u>Student's Edition</u>

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Teacher Resources

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Resources:

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- <u>http://www.kutasoftware.com</u> Test and worksheet generator for teachers
- <u>http://khanacademy.org</u> Tutorials on individual lessons

Stage 2 – Assessment Evidence

Performance Task(s):

Learning Activities: ACT Math: Ups and Downs Pick a Project: Write a Speech For a Debate, Draw a Venn Diagram, Choose a Cell Phone Plan, or Make a Model of a Stained-Glass Window Stem Project: Daily Grind

Pre-Assessments:

Gr 6 Math *LinkIt*! NJSLS Form A Topic Readiness Assessment Grade 6 Readiness Test

Formative Assessments:

IXL LinkIt Mid Topic Checkpoint Review and Fluency Practice Exit tickets

Summative Assessments:

Quizzes Tests

Benchmark: Cumulative Final with multiple choice, short answer, and ECR

Alternative:

Quizizz Kahoot Cool Math Games NJCTL Quizzes Kuta Software

Stage 3 – Learning Plan

Learning Mindset: Global Awareness

Topic Opener:

- Topic 5: Daily Grind
- Diagnostic Assessment: Get Ready!

Topic 4:

- Lesson 5.1: Estimate Solutions By Inspection
- Lesson 5.2: Solve Systems By Graphing
- Lesson 5.3: Solve Systems By Substitution
- Lesson 5.4: Solve Systems By Elimination

Торіс б	Congruence and Similarity
Suggested Time Frame	20 Days

Overview / Rationale

This unit is designed to deepen students' understanding of geometric transformations and their impact on two-dimensional figures. Students will explore how translations, reflections, and rotations affect the properties of figures, leading to the concept of congruence. Through a sequence of transformations, students will learn to map preimages to their images and understand the criteria for figures to be congruent.

The unit also introduces dilations and their role in creating similar figures, helping students recognize the relationship between preimages and images when scaling figures. By analyzing angle relationships formed by transversals intersecting parallel lines and the angles within triangles, students will develop a comprehensive understanding of similarity and congruence in geometric figures. This foundational knowledge is essential for solving complex geometric problems and understanding the underlying principles of symmetry and proportionality in mathematics.

STAGE 1: Desired Results

New Jersey Student Learning Standards for Mathematics

8.G.A.1- Verify experimentally the properties of rotations, reflections, and translations 8.G.A.1a-Lines are transformed to lines, and line segments to line segments of the same length. **8.G.A.1b-** Angles are transformed to angles of the same measure. **8.G.A.1c-**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- Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates **8.G.A.5**-Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. **Applied Standards for Mathematical Practice** 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.

Essential Questions	Enduring Understandings
	Students will understand
-How does a translation affect the properties of	-Analyzing translations, reflections, and rotations
two-dimensional figures?	
	-Composing transformations
-How does a reflection affect the properties of a	
two-dimensional figure?	-Understanding congruent factors
-How does a rotation affect the properties of a	-Describing dilations
two-dimensional figure?	

	-Understanding similar figures
-How can you use a sequence of transformations to map a preimage to its image? -How does a sequence of translations,	-Angles, lines, and transversals
reflections, and rotations result in congruent figures?	-Interior and exterior angles of triangles
-What is the relationship between a preimage and its image after dilation?	-Angle-angle triangle similarities
-How are similar figures related by a sequence of transformations?	
-What are the relationships among angles that are created when a line intersects two parallel lines?	
-How are the interior and exterior angles of a triangle related?	
-How can you use angle measures to determine whether two triangles are similar?	
Leaver Taugata Vaculadas	Leoning Tongston Shills
Students will know	Students will be able to
-Understanding how translations affect the properties of two-dimensional figures	-Apply translations to two-dimensional figures and analyze their effects on the figures' properties.
-Understanding the impact of reflections on the properties of two-dimensional figures	-Perform reflections on two-dimensional figures and describe the changes to the figures' properties.
-Understanding how rotations affect the properties of two-dimensional figures	-Execute rotations of two-dimensional figures and evaluate how the figures' properties are affected.
-Recognizing how a sequence of transformations (translations, reflections, and rotations) maps a preimage to its image	-Use a sequence of transformations (translations, reflections, and rotations) to map a preimage to its image accurately.
-Identifying how sequences of translations, reflections, and rotations result in congruent figures	-Determine and justify whether two figures are congruent based on a sequence of translations, reflections, and rotations.

-Apply dilations to figures and describe the
image.
-Use sequences of transformations to establish and explain the similarity between figures.
-Identify and analyze angle relationships created
when a line intersects two parallel lines.
-Calculate and interpret the relationships between
the interior and exterior angles of triangles.
-Use angle measures to determine and explain the similarity of two triangles using the angle-angle similarity criterion.

Key Academic Vocabulary		
Review:	New:	
Adjacent angles	Alternate interior angles	
Complementary angles	Angle of rotation	
Supplementary angles	Center of rotation	
Vertical angles	Congruent	
	Corresponding angles	
	Dilation	
	Enlargement	
	Exterior angle of a triangle	
	Image	
	Line of reflection	
	Reduction	
	Reflection	
	Remote interior of angles	
	Rotation	
	Same-side interior angles	
	Scale factor	
	Similar	
	Transformation	
	Translation	
	Transversal	

Interdisciplinary Connections

New Jersey Student Learning Standards for English Language Arts

- **R7.** Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
- W7. Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.
- **W9.** Draw evidence from literary or informational texts to support analysis, reflection, and research.

2020 New Jersey Student Learning Standards for Computer Science and Design Thinking NJSLS 8.1 Computer Science

• **8.1.8.NI.1:** Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination.

- **8.1.8.NI.2:** Model the role of protocols in transmitting data across networks and the Internet and how they enable secure and errorless communication.
- **8.1.8.NI.4:** Explain how new security measures have been created in response to key malware events.
- **8.1.8.IC.2:** Describe issues of bias and accessibility in the design of existing technologies.
- **8.1.8.DA.1:** Organize and transform data collected using computational tools to make it usable for a specific purpose.

NJSLS 8.2 Design Thinking

- **8.2.8.ED.1:** Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer
- **8.2.8.ITH.2:** Compare how technologies have influenced society over time.
- **8.2.8.ITH.5:** Compare the impacts of a given technology on different societies, noting factors that may make a technology appropriate and sustainable in one society but not in another.

Stage 2 – Assessment Evidence

Performance Task(s):

Learning Activities:

ACT Math: Tricks of the Trade Pick a Project: Write a Biography, Record A Video About Similar Figures, Build a Model of a Truss Bridge, or Design a Tessellation Stem Project: Forest Health

Pre-Assessments:

Gr 6 Math *LinkIt*! NJSLS Form A Topic Readiness Assessment Grade 6 Readiness Test

Formative Assessments: IXL LinkIt Mid Topic Checkpoint Review and Fluency Practice Exit tickets

Summative Assessments: Quizzes Tests

Benchmark: Cumulative Final with multiple choice, short answer, and ECR

Alternative:
Quizizz
Kahoot
Cool Math Games
NJCTL Quizzes
Kuta Software

Stage 3 – Learning Plan

Learning Mindset: Investigative curiosity and applied problem-solving.

Topic Opener:

- Topic 6: Forest Health
- Diagnostic Assessment: Get Ready!

Topic 6:

- Lesson 6.1: Analyze Translations
- Lesson 6.2: Analyze Reflections
- Lesson 6.3: Analyze Rotations
- Lesson 6.4: Compose Transformations
- Lesson 6.5: Understand Congruent Figures
- Lesson 6.6: Describe Dilations
- Lesson 6.7: Understand Similar Figures
- Lesson 6.8: Angles, Lines, and Transversals
- Lesson 6.9: Interior and Exterior Angles of Triangles
- Lesson 6.10: Angle-Angle Triangle Similarity

Student Resources

Texts: Savvas Envision Mathematics Common Core 2021

Resources: <u>Student's Edition</u>

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- Pick a Project

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- Devices:
 - Chromebooks

Texas Instruments (TI-30X Calculators)

Teacher Resources

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- Google Suite: Docs, Sheets, Slides, Forms
- Devices: Chromebooks

Websites:

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- <u>http://www.kutasoftware.com</u> Test and worksheet generator for teachers
- <u>http://khanacademy.org</u> Tutorials on individual lessons

Topic 7	Understand And Apply The Pythagorean Theorem
Suggested Time Frame	25 Days

Overview / Rationale

In this unit, students will delve into the Pythagorean Theorem and its applications, focusing on its significance in solving problems involving right triangles. Understanding how the theorem relates the side lengths of a right triangle is fundamental for various real-world and mathematical contexts, from basic geometry to complex engineering challenges. Students will explore how to determine whether a triangle is right-angled and apply the theorem to solve practical problems, such as calculating distances between points in the coordinate plane.

The unit will also cover the converse of the Pythagorean Theorem, which helps in verifying whether a given triangle is a right triangle. By applying these concepts, students will develop a solid foundation in using the Pythagorean Theorem to solve geometric problems and gain insights into its broader applications. This knowledge is not only crucial for academic progression but also for practical problem-solving in fields such as construction, design, and navigation.

STAGE 1: Desired Results

	New Jersey Student Learning Standards for Mathematics		
8.G.B.6- Expla	in 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.			

Essential Questions	Enduring Understandings
-How does the Pythagorean Theorem relate the side lengths of a right triangle?	-Understanding the Pythagorean Theorem
-How can you determine whether a triangle is a right triangle?	-Understanding the converse of the Pythagorean Theorem

-What types of problems can be solved using the Pythagorean Theorem?	-Applying the Pythagorean Theorem in order to solve problems
-How can you use the Pythagorean Theorem to find the distance between two points?	-Finding distance in the coordinate plane
Learning Targets: Knowledge Students will know	Learning Targets: Skills Students will be able to
-The relationship between the side lengths of a right triangle and the Pythagorean Theorem.	-Apply the Pythagorean Theorem to find unknown side lengths in right triangles.
-Identifying and verifying a right triangle using the Pythagorean Theorem.	-Use the Pythagorean Theorem to determine if a given triangle is a right triangle.
-Application of the Pythagorean Theorem to solve real-world and mathematical problems.	-Solve real-world and mathematical problems involving right triangles by applying the Pythagorean Theorem.
-Using the Pythagorean Theorem to calculate the distance between two points on the coordinate plane.	-Calculate the distance between two points in the coordinate plane using the Pythagorean Theorem.

Key Academic Vocabulary	
Review:	New:
Cube root	Converse of the Pythagorean Theorem
Diagonal	Hypotenuse
Isosceles triangle	Leg
Perimeter	Proof
Right triangle	Pythagorean Theorem
Square root	

Interdisciplinary Connections

New Jersey Student Learning Standards for English Language Arts

- **R7.** Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
- W7. Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.
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- **8.1.8.NI.2:** Model the role of protocols in transmitting data across networks and the Internet and how they enable secure and errorless communication.
- **8.1.8.NI.4:** Explain how new security measures have been created in response to key malware events.
- **8.1.8.IC.2:** Describe issues of bias and accessibility in the design of existing technologies.
- **8.1.8.DA.1:** Organize and transform data collected using computational tools to make it usable for a specific purpose.

NJSLS 8.2 Design Thinking

- **8.2.8.ED.1:** Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer
- **8.2.8.ITH.2:** Compare how technologies have influenced society over time.
- **8.2.8.ITH.5:** Compare the impacts of a given technology on different societies, noting factors that may make a technology appropriate and sustainable in one society but not in another.

Stage 2 – Assessment Evidence

Performance Task(s):

Learning Activities:

ACT Math: Go With The Flow Pick a Project: Plan a Metric Century Ride, Build a Kite, Make a Scrapbook, or Design a Fabric Template Stem Project: Rainy Days

Pre-Assessments:

Gr 6 Math *LinkIt*! NJSLS Form A Topic Readiness Assessment Grade 6 Readiness Test

Formative Assessments: IXL

LinkIt Mid Topic Checkpoint Review and Fluency Practice Exit tickets

Summative Assessments: Quizzes Tests

Benchmark:

Cumulative Final with multiple choice, short answer, and ECR

Alternative:

Quizizz Kahoot Cool Math Games NJCTL Quizzes Kuta Software

Stage 3 – Learning Plan

Learning Mindset: Critical Thinking

Topic Opener:

- Topic 7: Rainy Days
- Diagnostic Assessment: Get Ready!

Topic 7:

- Lesson 7.1: Understand the Pythagorean Theorem
- Lesson 7.2: Understand the Converse of the Pythagorean Theorem
- Lesson 7.3: Apply the Pythagorean Theorem to Solve Problems
- Lesson 7.4: Find Distance in the Coordinate Plane

Student Resources

Texts: Savvas Envision Mathematics Common Core 2021

Resources: <u>Student's Edition</u>

- Review What You Know
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- Mid-topic checkpoint and Performance Task
- Topic Review
- Pick a Project

Websites:

- <u>http://www.hmhco.com</u>
- <u>http://khanacademy.org</u>

Integrated Technology

- Google Suite: Docs, Sheets, Slides, Forms
- Devices:
 - Chromebooks

Texas Instruments (TI-30X Calculators)

Teacher Resources

Texts: Savvas Envision Mathematics Common Core 2021

Resources:

- Google Suite: Docs, Sheets, Slides, Forms
- Devices: Chromebooks

Websites:

- <u>http://www.hmhco.com</u> Into Math Ed, Your Friend in Learning
- <u>http://www.kutasoftware.com</u> Test and worksheet generator for teachers
- http://khanacademy.org Tutorials on individual lessons

Topic 8	Solve Problems Involving Surface Area And Volume
Suggested Time Frame	20 Days

Overview / Rationale

This unit delves into the geometric concepts of surface area and volume for three-dimensional figures, providing essential skills for solving real-world problems involving space and capacity. Understanding how to calculate the surface area of three-dimensional shapes allows students to determine the amount of material needed to cover these objects, while knowledge of volume calculations is crucial for determining capacity and spatial relationships.

Students will explore the surface area formulas for various three-dimensional figures, including cylinders, cones, and spheres, and learn to compute their volumes. They will investigate the relationships between these different volumes, such as how the volume of a cone relates to that of a cylinder and how the volume of a sphere compares to that of a cone. This unit aims to develop students' ability to apply these geometric principles in practical contexts, enhancing their problem-solving skills and understanding of spatial reasoning.

STAGE 1: Desired Results

New Jersey Student Learning Standards for Mathematics	
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.
Applied Stand	lards for Mathematical Practice
 Make s 	ense 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.

Essential Questions	Enduring Understandings
	Students will understand
-How are the areas of polygons used to find the	-Finding surface area of three-dimensional figures
surface area formulas for three-dimensional	
figures?	-Finding the volume of cylinders

How is the volume of a cylinder related to the	Finding the volume of cones
-riow is the volume of a cylinder related to the	-1 maning the volume of cones
volume of a rectangular prism?	
	-Finding the volume of spheres
-How is the volume of a cone related to the	
volume of a cylinder?	
-How is the volume of a sphere related to the	
volume of a cone?	
Learning Targets: Knowledge	Learning Targets: Skills
Students will know	Students will be able to
-Understand how the areas of polygons are used	-Calculate surface area using formulas for
-Understand how the areas of polygons are used to derive the surface area formulas for	-Calculate surface area using formulas for three-dimensional figures.
-Understand how the areas of polygons are used to derive the surface area formulas for three-dimensional figures.	-Calculate surface area using formulas for three-dimensional figures.
-Understand how the areas of polygons are used to derive the surface area formulas for three-dimensional figures.	-Calculate surface area using formulas for three-dimensional figures.-Compute the volume of cylinders.
 -Understand how the areas of polygons are used to derive the surface area formulas for three-dimensional figures. -Explain the relationship between the volume of 	-Calculate surface area using formulas for three-dimensional figures.-Compute the volume of cylinders.
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Key Academic Vocabulary		
Review:	New:	
Base	Composite figure	
Diameter	Cone	
Radius	Cylinder	
Three-dimensional	Sphere	
Two-dimensional		

Interdisciplinary Connections

New Jersey Student Learning Standards for English Language Arts

- **R7.** Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
- W7. Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.
- **W9.** Draw evidence from literary or informational texts to support analysis, reflection, and research.

2020 New Jersey Student Learning Standards for Computer Science and Design Thinking NJSLS 8.1 Computer Science

- **8.1.8.NI.1:** Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination.
- **8.1.8.NI.2:** Model the role of protocols in transmitting data across networks and the Internet and how they enable secure and errorless communication.
- **8.1.8.NI.4:** Explain how new security measures have been created in response to key malware events.
- **8.1.8.IC.2:** Describe issues of bias and accessibility in the design of existing technologies.
- **8.1.8.DA.1:** Organize and transform data collected using computational tools to make it usable for a specific purpose.

NJSLS 8.2 Design Thinking

- **8.2.8.ED.1:** Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer
- **8.2.8.ITH.2:** Compare how technologies have influenced society over time.
- **8.2.8.ITH.5:** Compare the impacts of a given technology on different societies, noting factors that may make a technology appropriate and sustainable in one society but not in another.

Stage 2 – Assessment Evidence

Performance Task(s):

Learning Activities:

ACT Math: Measure Up Pick a Project: Design Props or Stage Structures, Make a Model of a Museum, Pour and Measure Sand, or Write a Skit Stem Project: Wrap it Up!

Pre-Assessments:

Gr 6 Math *LinkIt*! NJSLS Form A Topic Readiness Assessment Grade 6 Readiness Test

Formative Assessments:

IXL LinkIt Mid Topic Checkpoint Review and Fluency Practice Exit tickets

Summative Assessments: Quizzes Tests

Benchmark: Cumulative Final with multiple choice, short answer, and ECR

Alternative:

Quizizz Kahoot Cool Math Games NJCTL Quizzes Kuta Software

Stage 3 – Learning Plan

Learning Mindset: Sustainable Design

Topic Opener:

- Topic 8: Wrap it Up!
- Diagnostic Assessment: Get Ready!

Topic 8:

- Lesson 8.1: Find Surface Area of Three-Dimensional Figures
- Lesson 8.2: Find Volume of Cylinders
- Lesson 8.3: Find Volume of Cones
- Lesson 8.4: Find Volume of Spheres

Student Resources

Texts: Savvas Envision Mathematics Common Core 2021

Resources: <u>Student's Edition</u>

- Review What You Know
- Language Development Activity
- Mid-topic checkpoint and Performance Task
- Topic Review
- Pick a Project

Websites:

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- <u>http://khanacademy.org</u>

Integrated Technology

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- http://khanacademy.org Tutorials on individual lessons

CAREER READINESS, LIFE LITERACIES, AND KEY SKILLS 9.1 FINANCIAL LITERACY - Grades 6 - 8

	Financial Psychology
	An individual's values and emotions will influence the ability to modify financial behavior (when appropriate), which will impact one's financial wellbeing.
Х	9.1.8.FP.1: Describe the impact of personal values on various financial scenarios.
Х	9.1.8.FP.3: Explain how self-regulation is important to managing money (e.g., delayed gratification, impulse buying, peer pressure, etc.).

Х	9.1.8.FP.5: Determine how spending, investing, and using credit wisely contributes to financial well-being.
	Financial Institutions
	There are a variety of factors that influence how well suited a financial institution and/or service will be in meeting an individual's financial needs.
Х	9.1.8.FI.1: Identify the factors to consider when selecting various financial service providers.
Х	9.1.8.FI.4: Analyze the interest rates and fees associated with financial products.
	Economic and Government Influence
	Taxes affect one's personal finances.
Х	9.1.8.EG.1: Explain how taxes affect disposable income and the difference between net and gross income
	Planning and Budgeting
	A budget aligned with an individual's financial goals can help prepare for life events.
Х	9.1.8.PB.2: Explain how different circumstances can affect one's personal budget.
	Goals (e.g., higher education, autos, and homes, retirement), affect your finances.
Х	9.1.8.PB.6: Construct a budget to save for short-term, long term, and charitable goals.
	There are strategies to decrease and manage expenses.
Х	9.1.8.PB.7: Brainstorm techniques that will help decrease expenses including comparison shopping, negotiating, and day-to-day expense management.
	Credit Profile
	There are strategies to build and maintain a good credit history.
X	9.1.8.CP.2: Analyze how spending habits affect one's ability to save.

9.2 CAREER AWARENESS, EXPLORATION, PREPARATION AND TRAINING - Grades 6-8			
	Career Awareness and Planning		
	An individual's strengths, lifestyle goals, choices, and interests affect employment and income		
X	9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.		
X	9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement.		

	Developing and implementing an action plan is an essential step for achieving one's personal and professional goals.
X	9.2.5.CAP.5: Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers.
	Early planning can provide more options to pay for postsecondary training and employment.
X	9.2.8.CAP.6: Compare the costs of postsecondary education with the potential increase in income from a career of choice.
X	9.2.8.CAP.7: Devise a strategy to minimize costs of postsecondary education.
	There are a variety of resources available to help navigate the career planning process.
X	9.2.8.CAP.11: Analyze potential career opportunities by considering different types of resources, including occupation databases, and state and national labor market statistics.
Х	9.2.8.CAP.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.
	Communication skills and responsible behavior in addition to education, experience, certifications, and skills are all factors that affect employment and income.
X	9.2.8.CAP.15: Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.
X	9.2.8.CAP.18: Explain how personal behavior, appearance, attitudes, and other choices may impact the job application process.
X	9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level.

Making Connections to Careers

- Financial Analyst
- Insurance Underwriter
- Actuary
- Statistician
- Engineer
- Economist
- Food Services
- Flight Engineer
- Agricultural worker
- Retail clerk
- Real Estate Agent

- Construction Manager
- Corrections Officer •
- Human Resources •
- Electrician •
- Financial Analyst •
- Financial EngineerCartographerUrban Planning

- Robotics
- Computer Design Digital Marketer •
- •
- Product Manager
- Sociologist •

	9.4 LIFE LITERACIES AND KEY SKILLS					
	Grade 6-8					
	Critical Thinking and Problem-solving					
	Multiple solutions often exist to solve a problem.					
Х	9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective.					
Х	9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).					
	An essential aspect of problem solving is being able to self-reflect on why possible solutions for solving problems were or were not successful.					
Х	9.4.8.CT.3: Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.					
	Digital Citizenship					
	Detailed examples exist to illustrate crediting others when incorporating their digital artifacts in one's own work.					
Х	9.4.8.DC.1: Analyze the resource citations in online materials for proper use.					
	9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products.					
	There are tradeoffs between allowing information to be public and keeping information private and secure.unauthorized use of data, such as personally owned video, photos, and music.					
Х	9.4.8.DC.3: Describe tradeoffs between allowing information to be public (e.g., within online games) versus keeping information private and secure.					
	Digital footprints are publicly accessible, even if only shared with a select group. Appropriate measures such as proper interactions can protect online reputations.					
X	9.4.8.DC.4: Explain how information shared digitally is public and can be searched, copied, and potentially seen by public audiences.					
X	9.4.8.DC.5: Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure.					
	Global and Cultural Awareness					
	Awareness of and appreciation for cultural differences is critical to avoid barriers to productive and positive interaction.					
X	9.4.8.GCA.1: Model how to navigate cultural differences with sensitivity and respect.					
Х	9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.					
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	Information and Media Literacy					
	Increases in the quantity of information available through electronic means have heightened the need to check sources for possible distortion, exaggeration, or misrepresentation.					
Х	9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.					
	Digital tools make it possible to analyze and interpret data, including text, images, and sound. These tools allow for broad concepts and data to be more effectively communicated.					
Х	9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations.					
	The mode of information can convey a message to consumers or an audience.					
Х	9.4.8.IML.6: Identify subtle and overt messages based on the method of communication.					
	Sources of information are evaluated for accuracy and relevance when considering the use of information.					
Х	9.4.8.IML.7: Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose.					
Х	9.4.8.IML.8: Apply deliberate and thoughtful search strategies to access high-quality information on climate change.					
	There are ethical and unethical uses of information and media.					
Х	9.4.8.IML.9: Distinguish between ethical and unethical uses of information and media.					
Х	9.4.8.IML.10: Examine the consequences of the use of media.					
Х	9.4.8.IML.11: Predict the personal and community impact of online and social media activities.					
	There is a need to produce and publish media that has information supported with quality evidence and is intended for authentic audiences.					
Х	9.4.8.IML.14: Analyze the role of media in delivering cultural, political, and other societal messages.					
Х	9.4.8.IML.15: Explain ways that individuals may experience the same media message differently.					
	Technology Literacy					
	Some digital tools are appropriate for gathering, organizing, analyzing, and presenting information, while other types of digital tools are appropriate for creating text,					

	visualizations, models, and communicating with others.					
X	9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.					
X	9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem.					
X	9.4.8.TL.3: Select appropriate tools to organize and present information digitally.					
	Digital tools allow for remote collaboration and rapid sharing of ideas unrestricted by geographic location or time.					
X	9.4.8.TL.5: Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.					
X	9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.					

Accommodations and Modifications

Below please find a list of suggestions for accommodations and modifications to meet the diverse needs of our students. Teachers should consider this a resource and understand that they are not limited to the recommendations included below.

An **accommodation** *changes* HOW *a student learns*; the change needed does not alter the grade-level standard. A **modification** *changes* WHAT *a student learns*; the change alters the grade-level expectation.

Special Education and 504 Plans

All modifications and accommodations must be specific to each individual child's IEP (Individualized Educational Plan) or 504 Plan.

- Pre-teach or preview vocabulary
- Repeat or reword directions
- Have students repeat directions
- Use of small group instruction
- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments
- Repetition and time for additional practice
- Model skills/techniques to be mastered
- Extended time to complete task/assignment/work
- Provide a copy of class notes
- Strategic seating (with a purpose eg. less distraction)
- Flexible seating
- Repetition and additional practice
- Use of manipulatives
- Use of assistive technology (as appropriate)
- Assign a peer buddy
- Emphasize key words or critical information by highlighting
- Use of graphic organizers
- Scaffold with prompts for sentence starters
- Check for understanding with more frequency
- Provide oral reminders and check student work during independent practice
- Chunk the assignment broken up into smaller units, work submitted in phases
- Encourage student to proofread assignments and tests
- Provide regular home/school communication
- Teacher checks student planner
- Provide student with clear expectations in writing and grading criteria for assignments (rubrics)

Testing Accommodations:

Students should receive all testing accommodations for Benchmark assessments that they receive for State testing.

- Setting: Alternate setting for assessments, small groups, screens to block distractions
- Presentation: large print, test readers, use of audio, fewer questions on each page
- Response: answer verbally, use large block answer sheet, speech-to-text dictation, accept short answers
- Allow for retakes
- Provide study guides
- Use of reference aids such as glossary, multiplication tables, calculator
- Choice of test format (multiple-choice, essay, true-false)
- Alternate ways to evaluate (projects or oral presentations instead of written tests)
- Open-book or open-note tests

English Language Learners:

All modifications and accommodations should be specific to each individual child's LEP level as determined by the WIDA screening or ACCESS, utilizing the WIDA Can Do Descriptors.

- Pre-teach or preview vocabulary
- Repeat or reword directions
- Have students repeat directions
- Use of small group instruction
- Scaffold language based on their Can Do Descriptors
- Alter materials and requirements according to Can Do Descriptors
- Adjust number of paragraphs or length of writing according to their Can Do Descriptor
- TPR (Total Physical Response-Sheltered Instruction strategy) Demonstrate concepts through multi-sensory forms such as with body language, intonation
- Pair visual prompts with verbal presentations
- Repetition and additional practice
- Model skills and techniques to be mastered
- Native Language translation (peer, assistive technology, bilingual dictionary)
- Emphasize key words or critical information by highlighting
- Use of graphic organizers
- Scaffold with prompts for sentence starters
- Check for understanding with more frequency
- Use of self-assessment rubrics
- Increase one-on-one conferencing; frequent check ins
- Use study guide to organize materials
- Make vocabulary words available in a student created vocabulary notebook, vocabulary bank, Word Wall, or vocabulary ring
- Extended time
- Select text complexity and tiered vocabulary according to Can Do Descriptors
- Projects completed individually or with partners
- Use online dictionary that includes images for words: <u>http://visual.merriamwebster.com/</u>.
- Use online translator to assist students with pronunciation: <u>http://www.reverso.net/text_translation.aspx?lang=EN</u>.

Students at Risk of Failure:

- Use of self-assessment rubrics for check-in
- Pair visual prompts with verbal presentations
- Ask students to restate information and/or directions
- Opportunity for repetition and additional practice
- Model skills/techniques to be mastered
- Extended time
- Provide copy of class notes
- Strategic seating with a purpose
- Provide students opportunity to make corrections and/or explain their answers
- Support organizational skills
- Check daily planner
- Encourage student to proofread work
- Assign a peer buddy
- Build on students' strengths based on Multiple Intelligences: Linguistic (verbal); Logical (reasoning); Musical/Rhythmic; Intrapersonal Intelligence (understanding of self); Visual Spatial Intelligence; Interpersonal Intelligence (the ability to interact with others effectively); Kinesthetic (bodily); Naturalist Intelligence; and Learning Styles: Visual; Auditory; Tactile; Kinesthetic; Verbal

High Achieving:

Extension Activities

- Allow for student choice from a menu of differentiated outcomes; choices grouped by complexity of thinking skills; variety of options enable students to work in the mode that most interests them
- Allow students to pursue independent projects based on their individual interests
- Provide enrichment activities that include more complex material
- Allow opportunities for peer collaboration and team-teaching
- Set individual goals
- Conduct research and provide presentation of appropriate topics
- Provide students opportunity to design surveys to generate and analyze data to be used in discussion
- Allow students to move through the assignment at their own pace (as appropriate)

Strategies to Differentiate to Meet the Needs of a Diverse Learning Population

- Vocabulary Sorts-students engage with the vocabulary word by sorting into groups of similar/different rather than memorizing definitions
- Provide "Realia" (real life objects to relate to the five senses) and ask questions relating to the senses
- Role Play-students create or participate in role playing situations or Reader's Theater
- Moving Circle-an inside and outside circle partner and discuss, circles moves to new partner (Refer to Kagan Differentiated Strategies)

- Brainstorm Carousel-Large Post Its around the room, group moves in a carousel to music. Group discusses the topic and responses on paper. Groups rotate twice to see comments of others. (Refer to Kagan Differentiated Strategies)
- Gallery Walk-Objects, books, or student work is displayed. Students examine artifacts and rotate.
- Chunking-chunk reading, tests, questions, homework, etc to focus on particular elements.
- Think Pair Share Write
- Think Talk Write
- Think Pair Share
- Note-taking -can be done through words, pictures, phrases, and sentences depending on level
- KWL (Know, Want to Know, Learned)/KWHL(Know, What to Know, How Will I Learn, learned)/KWLS (Know, Want to Know, Learned, Still Want to Know) /KWLQ (Know, What to Know, Learned, Questions I Still Have) Charts
- Corners Cooperative Learning Strategy: <u>http://cooperativelearningstrategies.pbworks.com/w/page/28234420/Corners</u>.
- Circle Map strategy- place the main topic in a small circle and add student ideas in a bigger circle around the topic. Students may use their native language with peers to brainstorm.
- Flexible grouping -as a whole class, a small group, or with a partner, temporary groups are created:

http://www.teachhub.com/flexible-grouping-differentiated-instruction-strategy.

• Jigsaw Activities -cooperative learning in a group, each group member is responsible for becoming an "expert" on one section of the assigned material and then "teaching" it to the other members of the team: <u>http://www.adlit.org/strategies/22371/</u>.

Grade 6 Mathematics Pacing Guide						
LESSONS	ТОРІС	NJSLS	LESSONS	ТОРІС	NJSLS	
1	Class Introduction to Course		26	Topic 1.10		
2	LinkIt! Pre-Assessment		27	Topic 1.10		
3	LinkIt! Pre-Assessment		28	Topic 1 Review		
4	Into Math Pre-Assessment		29	Topic 1 Test		
5	Into Math Pre-Assessment		30	Topic 2 STEM Task		
6	Topic 1 STEM Task		31	Topic 2		
7	Topic 1		32	Topic 2.1		
8	Topic 1.1		33	Topic 2.1		
9	Topic 1.1		34	Topic 2.2		
10	Topic 1.2		35	Topic 2.2		
11	Topic 1.2		36	Topic 2.3		
12	Topic 1.3		37	Topic 2.3		
13	Topic 1.3		38	Topic 2.4		
14	Topic 1.4		39	Topic 2.4		
15	Topic 1.4		40	Topic 2.5		
16	Topic 1.5		41	Topic 2.5		
17	Topic 1.5		42	Topic 2.6		
18	Topic 1.6		43	Topic 2.6		
19	Topic 1.6		44	Topic 2.7		
20	Topic 1.7		45	Topic 2.7		
21	Topic 1.7		46	Topic 2.8		
22	Topic 1.8		47	Topic 2.8		
23	Topic 1.8		48	Topic 2.9		
24	Topic 1.9		49	Topic 2.9		
25	Topic 1.9		50	Topic 2 Reivew		

Grade 6 Mathematics Pacing Guide						
LESSONS	TOPIC	NJSLS	LESSONS	ТОРІС	NJSLS	
51	Topic 2 Test		76	Topic 4.4		
52	Topic 3 STEM Task		77	Topic 4.5		
53	Topic 3		78	Topic 4.5		
54	Topic 3.1		79	Topic 4 Review		
55	Topic 3.1		80	Topic 4 Test		
56	Topic 3.2		81	Midterm Exam Review		
57	Topic 3.2		82	Midterm Exam		
58	Topic 3.3		83	Midterm LinkIt! Exam		
59	Topic 3.4		84	Midterm LinkIt! Exam		
60	Topic 3.4		85	Topic 5 Stem Task		
61	Topic 3.5		86	Topic 5		
62	Topic 3.5		87	Topic 5.1		
63	Topic 3.6		88	Topic 5.1		
64	Topic 3.6		89	Topic 5.2		
65	Topic 3 Review		90	Topic 5.2		
66	Topic 3 Test		91	Topic 5.3		
67	Topic 4 STEM Task		92	Topic 5.3		
68	Topic 4		93	Topic 5.4		
69	Topic 4.1		94	Topic 5.4		
70	Topic 4.1		95	Topic 5 Review		
71	Topic 4.2		96	Topic 5 Test		
72	Topic 4.2		97	Topic 6 STEM Task		
73	Topic 4.3		98	Topic 6		
74	Topic 4.3		99	Topic 6.1		
75	Topic 4.4		100	Topic 6.1		

Grade 6 Mathematics Pacing Guide							
LESSONS	ΤΟΡΙΟ	NJSLS	LESSONS	торіс	NJSLS		
101	Topic 6.2		126	Topic 7.2			
102	Topic 6.2		127	Topic 7.3			
103	Topic 6.3		128	Topic 7.3			
104	Topic 6.3		129	Topic 7.4			
105	Topic 6.4		130	Topic 7.4			
106	Topic 6.4		131	Topic 7 Review			
107	Topic 6.5		132	Topic 7 Test			
108	Topic 6.5		133	Topic 8 STEM Task			
109	Topic 6.6		134	Topic 8			
110	Topic 6.6		135	Topic 8.1			
111	Topic 6.7		136	Topic 8.1			
112	Topic 6.7		137	Topic 8.2			
113	Topic 6.8		138	Topic 8.2			
114	Topic 6.8		139	Topic 8.3			
115	Topic 6.9		140	Topic 8.3			
116	Topic 6.9		141	NJSLA Administration			
117	Topic 6.10		142	NJSLA Administration			
118	Topic 6.10		143	NJSLA Administration			
119	Topic 6 Review		144	NJSLA Administration			
120	Topic 6 Test		145	NJSLA Administration			
121	Topic 7 STEM Task		146	NJSLA Administration			
122	Topic 7		147	Topic 8 Stem Task			
123	Topic 7.1		148	Topic 8.4			
124	. Topic 7.1		149	Topic 8.4			
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Grade 6 Mathematics Pacing Guide						
LESSONS	TOPIC		LESSONS	ТОРІС		
151	Topic 8 Test		176	EOY Math Project		
152	Volume 2 Review		177	Eoy Math Project		
153	Volume 2 Review		178	Eoy Math Project		
154	Volume 2 Review		179	Eoy Math Project		
155	Volume 2 Review		180	Eoy Math Project		
156	Volume 2 Test					
157	Volume 2 Test					
158	EOY Exam Review					
159	EOY Exam Review					
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161	EOY TEST					
162	EOY Linkit! Review					
163	EOY LinkIt! Review					
164	EOY <i>LinkIt!</i> Exam					
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166	EOY Into Math Exam					
167	EOY Into Math Exam					
168	EOY Math Project					
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171	EOY Math Project					
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173	EOY Math Project					
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175	EOY Math Project					

NEPTUNE CITY SCHOOL DISTRICT

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