NEPTUNE TOWNSHIP SCHOOL DISTRICT

Pre-Algebra
Curriculum
Grade 8

NEPTUNE TOWNSHIP SCHOOL DISTRICT
Office of the Superintendent
60 Neptune Blvd.
Neptune, NJ 07753-4836

May 29, 2024 Document C1#1

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NEPTUNE TOWNSHIP SCHOOL DISTRICT

PRE-ALGEBRA
CURRICULUM
GRADE 8

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Curriculum

NEPTUNE TOWNSHIP SCHOOL DISTRICT

Pre-Algebra
Grade 8

Acknowledgements

The Pre-Algebra Grade 8 Curriculum guide was developed for Neptune Middle School through the efforts of Suzanne DeValue, teacher of mathematics, with the guidance of Dawn Reinhardt, Department Chairperson, Lori Dalelio, STEM Supervisor, and Sally A. Millaway, Ed.D., Director for Curriculum, Instruction and Assessment.

Ms. DeValue is to be commended for her dedication in creating this curriculum in the UbD format and her expertise in the area of mathematics. The Pre-Algebra guide was written in alignment with the 2023 New Jersey Student Learning Standards for Mathematics and the interdisciplinary connections with the 2020 New Jersey Student Learning Standards in Computer Science and Design Thinking and Career Readiness, Life Literacies, and Key Skills. This curriculum guide focuses on developing students' conceptual understanding and growing students into procedurally fluent mathematicians. Students will practice productive perseverance and work collaboratively to solve problems. Units integrate growth mindset strategies, and social-emotional learning instruction to support creating a culture where students embrace math learning.

NEPTUNE TOWNSHIP SCHOOL DISTRICT

DISTRICT MISSION STATEMENT

The primary mission of the Neptune Township School District is to prepare all of our students for a life-long learning process and to become confident, competent, socially- and culturally-conscious citizens 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, equitable, and varied approach to teaching and learning
- An emphasis on critical thinking skills and problem-solving techniques
- A respect for and an appreciation for our world, its resources, and its diverse people
- A sense of responsibility, good citizenship, and accountability
- An involvement by the parents and the community in the learning process

Neptune Township School District

Educational Outcome Goals

The students in the Neptune Township schools will become life-long learners and will:

- Become fluent readers, writers, speakers, listeners, and viewers with comprehension and critical thinking skills.
- Acquire the mathematical skills, understandings, and attitudes that are needed to be successful in their careers and everyday life.
- Understand fundamental scientific principles, develop critical thinking skills, and demonstrate safe practices, skepticism, and open-mindedness when collecting, analyzing, and interpreting information.
- Become technologically literate.
- Demonstrate proficiency in all New Jersey Student Learning Standards (NJSLS).
- Develop the ability to understand their world and to have an appreciation for the heritage of America with a high degree of literacy in civics, history, economics and geography.
- Develop a respect for different cultures and demonstrate trustworthiness, responsibility, fairness, caring, and citizenship.
- Become culturally literate by being aware of the historical, societal, and multicultural aspects and implications of the arts.
- Demonstrate skills in decision-making, goal setting, and effective communication, with a focus on character development.
- Understand and practice the skills of family living, health, wellness and safety for their physical, mental, emotional, and social development.
- Develop consumer, family, and life skills necessary to be a functioning member of society.
- Develop the ability to be creative, inventive decision-makers with skills in communicating ideas, thoughts and feelings.
- Develop career awareness and essential technical and workplace readiness skills, which are significant to many aspects of life and work.

PRE-ALGEBRA
GRADE 8

COURSE DESCRIPTION

This course is designed for eighth grade students. The Grade 8 Pre-Algebra course is an introduction to basic algebra concepts and a review of arithmetic algorithms. This course emphasizes the language of algebra and problem-solving. Topics covered in this course include transformational geometry, linear equations and applications, relationships and functions, statistics and probability, real numbers and the Pythagorean Theorem, exponents, scientific notation, and volume. Students will solve real-world and mathematical problems utilizing various data and formulas.

This course focuses on three critical learning areas:

1. Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations;
2. Grasping the concept of a function and using functions to describe quantitative relationships; and
3. Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.

INTEGRATED SOCIAL AND EMOTIONAL LEARNING COMPETENCIES *The following social and emotional competencies are integrated in this curriculum document:*	
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
Social 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
Responsible 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

Unit Plan Title	**Unit 1: Transformational Geometry**
Suggested Time Frame	**23 Days**

Overview / Rational
Students explore and verify the properties of lines and angles in transformations. Students will use coordinates to describe the effect of translations, reflections, rotations, and dilations. Students execute a sequence of transformations on a figure in a coordinate plane that results in a congruent figure or a similar figure. Students will understand the difference between similarity and congruence and decide whether two figures are similar or congruent. ● **Module 1:** Students will investigate transformations and recognize congruent figures. ● **Module 2:** Students will investigate enlargements and reductions, and recognize similar figures.

STAGE 1: Desired Results

New Jersey Student Learning Standards for Mathematics (2023)
8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations. a. Lines are transformed to lines, and line segments to line segments of the same length. b. Angles are transformed to angles of the same measure. c. Parallel lines are transformed to parallel lines. **8.G.A.2** Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. **8.G.A.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. **8.G.A.4** Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
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 show that two figures are either congruent or similar to one another? ● How does a sequence of translations, reflections and rotations result in congruent figures? ● What effects do dilations have on two-dimensional geometric figures? ● How can you use angle measures to determine whether two figures are similar?	● It is possible to use more than one transformation to map a preimage onto its image. ● Each transformation can be drawn using figures on a coordinate plane and each follows algebraic rules. ● Transformations produce congruent figures. ● Dilations produce similar figures. ● The image that is a result of enlarging or reducing a preimage is not congruent to the preimage.
Learning Targets: Knowledge *Students will know…*	**Learning Targets: Skills** *Students will be able to…*
● A transformation is a change in size or position of a figure. ● Translation is a transformation that slides a figure right, left, up, or down. ● Reflection flips a figure across a line. ● Rotation turns a figure around a specific point. ● The difference between congruent and similar. ● Two figures are similar if one can be obtained from the other by a sequence of dilations and rotations, reflections, and/or translations. ● Two figures are congruent if one can be obtained from the other by a sequence of rotations, reflections, and/or translations.	● Describe a sequence of transformations that maps one similar figure onto another. ● Describe the effects of dilations, translations, rotations, and reflections using coordinates. ● Dilate, translate, rotate, and reflect two-dimensional figures on a coordinate plane. ● Verify that when a reflection, rotation, and/or translation is performed, lines are transformed to lines, and line segments to line segments of the same length. ● Verify that when a reflection, rotation, and/or translation is performed, angles are transformed to angles of the same measure.

Key Academic Vocabulary	
Review: ● Coordinate plane ● Segment ● Vertex ● Coordinate ● Plane ● Line of reflection ● Quadrant ● X-axis ● Y-Axis ● Origin	**New:** ● Transformation ● Image ● Mapping notation ● Preimage ● Prime notation ● Translate ● Reflection ● Center of rotation ● Rotation ● Congruent ● Center of dilation ● Dilation ● Scale factor ● Similar

Interdisciplinary Connections

2023 New Jersey Student Learning Standards: English Language Arts

Grade 8 Reading

RI.CR.8.1. Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and diagrams) that strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.

RI.MF.8.6. Evaluate the choices made (by the authors, directors, or actors) when presenting an idea in different mediums and the advantages and disadvantages of using different mediums or formats (e.g., visually, quantitatively) to address a question or solve a problem.

RI.AA.8.7. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

Grade 8 Writing

W.IW.8.2. Write informative/explanatory texts (including the narration of historical events, scientific procedures/ experiments, or technical processes) to examine a topic and

convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

W.SE.8.6. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

Grade 8 Speaking and Listening

SL.PE.8.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.
SL.II.8.2. Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

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.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 an individual's everyday activities and career options.
8.1.8.IC.2: Describe issues of bias and accessibility in the design of existing technologies.

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.

2020 New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills

NJSLS 9.2 Career Awareness, Exploration, Preparation and Training

9.2.8.CAP.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.

9.2.8.CAP.15: Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.

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.

NJSLS 9.4 Life Literacies and Key Skills

9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations.

9.4.8.IML.7: Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose.

9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.

Student Resources

Texts: Houghton Mifflin Harcourt **Into Math**, Grade 8, 1st edition, 2020, ISBN: 978-0-358-11604-2.

Resources: Into Math, Grade 8

- More Practice / Homework
- Reteach and Interactive Reteach
- Challenge and Interactive Challenge

Websites:

- https://www.hmhco.com/ui/login Into Math
- http://khanacademy.org Tutorials on individual lessons
- https://edpuzzle.com/ Video learning
- https://quizizz.com/?lng=en Assessment and practice
- https://www.desmos.com/ Online Graphing Calculator & Activities

Integrated Technology

- Google Suite: Docs, Sheets, Slides, Forms
- Into Math online program
- Devices:
  - Chromebooks
  - Texas Instruments (TI-30X Calculators)
  - SMART / Promethean Interactive Boards

Teacher Resources

Texts: Houghton Mifflin Harcourt, **Into Math,** Grade 8, 1st edition, 2020, ISBN: 978-0-358-11634-9**.**

Resources:

- **Into Math:**
  - Unit STEM Task Cards
  - Online Data-Driven Interventions
  - More Practice / Homework
  - Illustrative Mathematics
  - Reteach and Interactive Reteach
  - Challenge and Interactive Challenge
  - Ed – Your Friend in Learning
  - Anchor-Charts
  - Mini-Lesson Tabletop Flipchart
  - Math Vocabulary: http://partnersforlearning.org/wp-content/uploads/2014/09/Common-Core-Academic-Vocabulary-Mathematics-K-12.pdf

Websites:

- https://www.hmhco.com/ui/login Into Math Interactive
- http://khanacademy.org Tutorials on individual lessons
- http://www.kutasoftware.com Test and worksheet generator for teachers
- New Jersey Climate Education Hub

Integrated Technology:

- Google Suite: Docs, Sheets, Slides, Forms
- Microsoft Platform: Word, EXCEL, PowerPoint
- Devices: SMART / Promethean Interactive Boards

Stage 2 – Assessment Evidence

Performance Task(s):

- **Unit STEM activity:** *A Puzzling Transformation*
- Illustrative Mathematics
- Interactive Reteach
- Interactive Challenge
- NJSLA practice test problems: https://nj.mypearsonsupport.com/practice-tests/math/

Pre-Assessments:

- Gr 8 Math BOY Assessment - *LinkIt!*
- *Are You Ready?*

Formative Assessments:

- Gr 8 Math BOY Assessment - *LinkIt!*
- Exit Slip
- Student *"I Can"* Self-Assessment
- Informal Observations
- Homework

Summative Assessments:

- Lesson quizzes
- Module Tests A and B
- Gr 8 Math MOY Assessment - *LinkIt!*
- NJDOE Digital Item Library- Released NJSLA items
- Gr 8 Math EOY Assessment - *LinkIt!*

Stage 3 – Learning Plan

STEM Task: ***A Puzzling Transformation***

Learning Mindset: ***Challenge Seeking***

Module Opener:

- **Module 1:** ***Treasure Hunt***
- **Module 2:** ***Do You Haul Bones?***

Diagnostic Assessment: ***Are You Ready?***

Module 1: Transformations and Congruence

- **Lesson 1.1:** Investigate Transformations
- **Lesson 1.2:** Explore Translations
- **Lesson 1.3:** Explore Reflections
- **Lesson 1.4:** Explore Rotations
- **Lesson 1.5:** Understand and Recognize Congruent Figures

Module 2: Transformations and Similarity

- **Lesson 2.1:** Investigate Reductions and Enlargements
- **Lesson 2.2:** Explore Dilations
- **Lesson 2.3:** Understand and Recognize Similar Figures

Unit Plan Title	**Unit 2: Linear Equations and Applications**
Suggested Time Frame	**25 Days**

Overview / Rationale
Students will use algebraic properties to solve one variable linear equations. Students recognize and interpret linear equations that have no solution or infinitely many solutions. Students will use angle relationships in triangles. Students identify similar triangles given angle measures. Students find missing angle measures when parallel lines are cut by a transversal. **Module 3:** Students will solve linear equations. **Module 4:** Students will investigate angle relationships.

STAGE 1: Desired Results

New Jersey Student Learning Standards for Mathematics (2023)

8.EE.C.7 Solve linear equations in one variable.

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

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

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. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.

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 solve a multi-step equation? ● How can you check the reasonableness of ● your solution? ● How can I use and evaluate algebraic expressions in relation to real world applications? ● How can you describe angles formed by parallel lines and transversals? ● How can you describe the relationships among the angles of a triangle? ● How can you use angles to tell whether triangles are similar?	● The solution to an equation is the value(s) of the variable which makes the equation true. ● With one solution the variables do not cancel out and only one value makes the equation true. ● With no solution the variables cancel out and constants are not equal, no real number makes the equation true. ● With infinite solutions the variables cancel and constants are equal, any real number makes the equation true. ● Similar triangles have the same angles.
Learning Targets: Knowledge *Students will know…*	**Learning Targets: Skills** *Students will be able to…*
● A solution can replace a variable and will make the equation true. ● Distribution and combining like terms simplifies an expression or equation. ● Inverse operations are needed to solve equations. ● Similar triangles have corresponding angles that are congruent. ● Straight angles add up to 180 degrees ● Sum of interior angles of a triangle is 180 degrees.	● Solve linear equations using distributive property and combining like terms. ● Determine the number of solutions for an equation. ● Identify interior and exterior angles of triangles. ● Identify similar triangles. ● Make informal arguments about the angles formed from a transversal. ● Make informal arguments about angles of similar triangles.

Key Academic Vocabulary	
Review: ● Coefficient ● Distributive property ● Isolate the variable ● LCD ● Like terms ● Substitute ● Expression ● Interior angle	**New:** ● Infinitely many solutions ● No solution ● Exterior angle ● Exterior Angle Theorem ● Remote interior angle ● Triangle Sum Theorem ● Angle-Angle Similarity Postulate ● Alternate exterior angles ● Alternate interior angles ● Corresponding angles ● Same-side exterior angles ● Same-side interior angles ● Transversal

Interdisciplinary Connections

2023 New Jersey Student Learning Standards for English Language Arts

Grade 8 Reading

RI.CR.8.1. Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and diagrams) that strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.
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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.IC.1: Compare the trade-offs associated with computing technologies that affect individual's everyday activities and career options.
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.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.

2020 New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills

NJSLS 9.1 Financial Literacy

9.1.8.FP.7: Identify the techniques and effects of deceptive advertising.
9.1.8.CP.1: Compare prices for the same goods or services.

NJSLS 9.2 Career Awareness, Exploration, Preparation and Training

9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
9.2.8.CAP.6: Compare the costs of postsecondary education with the potential increase in income from a career of choice.
9.2.8.CAP.7: Devise a strategy to minimize costs of postsecondary education.
9.2.8.CAP.15: Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.

NJSLS 9.4 Life Literacies and Key Skills

9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations.
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9.4.8.IML.7: Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose.
9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem.

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  - Chromebooks
  - Texas Instruments (TI-30X Calculators)

Stage 2 – Assessment Evidence

Performance Task(s):

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Pre-Assessments:

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- NJDOE Digital Item Library- Released NJSLA items
- Gr 8 Math EOY Assessment - *LinkIt!*

Stage 3 – Learning Plan

STEM Task: ***All in the Music***

Learning Mindset: ***Perseverance***

Module Opener:

- **Module 3:** ***Rent a Tent***
- **Module 4:** ***A Fox From Any Angle***

Diagnostic Assessment: ***Are You Ready?***

Module 3: Solve Linear Equations

- **Lesson 3.1:** Solve Multi-step Linear Equations
- **Lesson 3.2:** Examine Special Cases
- **Lesson 3.3:** Apply Linear Equations

Module 4: Angle Relationships

- **Lesson 4.1:** Develop Angle Relationships for Triangles
- **Lesson 4.2:** Investigate Angle-Angle Similarity
- **Lesson 4.3:** Explore Parallel Lines Cut by a Transversal

Unit Plan Title	**Unit 3: Relationships and Functions**
Suggested Time Frame	**46 Days**

Overview / Rationale

Students relate right triangles to the coordinates of a line going through the origin, compare features of triangles and slope. Students will write the equation of a proportional relationship. Students will graph proportional relationships and interpret unit rate as a slope of the graph of a proportional relationship. Learn to identify functions and use them to solve problems. Interpret slope and y intercept of a line and construct functions to model linear relationships. Students will be able to compare functions. Students will be able to solve systems through graphing, substitution, and elimination. Recognize and interpret systems of two linear equations that have no solution or infinitely many solutions.

- **Module 5:** Students will investigate proportional relationships.
- **Module 6:** Students will understand and analyze functions.
- **Module 7:** Students will represent and solve systems of linear equations.

STAGE 1: Desired Results

New Jersey Student Learning Standards for Mathematics (2023)

8.EE.B.5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

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

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

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

b. Solve systems of two linear equations in two variables **using the substitution method** and estimate solutions by graphing the equations. Solve simple cases by inspection. For example: by inspection, conclude that $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6. Solve $3x + y = 30$ and $y = 2x$ using the substitution method; Solve $y = 3x + 1$ and $y = -2x + 7$ using the substitution method.

c. Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

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.
(Clarification: Function notation is not required in Grade 8).

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). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

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

8.F.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.

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 do you use patterns to understand mathematics and model situations? ● How do algebraic representations relate and compare to one another? ● How can we communicate and generalize algebraic relationships? ● How are the horizontal and vertical axes related?	● A solution to a system of linear equations is an ordered pair that satisfies both equations. ● Graphed lines with one point of intersection will have one solution. ● Parallel lines have no solution. ● Lines that are the same have infinitely many solutions. ● A function can be represented in many different ways. ● Y=mx+b defines a linear equation. ● Initial value and rate of change can be found in multiple representations. ● Graphs can be used to model situations.
Learning Targets: Knowledge *Students will know…*	**Learning Targets: Skills** *Students will be able to…*
● Parallel lines have the same slope and different y intercepts. ● Lines with different slopes will intercept. ● Lines are the same if they have the same slope and same y intercept. ● Systems of equations are 2 or more equations. ● Functions have one output for every input. ● Straight lines can be represented by y=mx+b. ● Slope intercept form has the slope and the y intercept identified.	● Solve systems graphically and algebraically. ● Solve real world and mathematical problems. ● Compare functions from different representations. ● Identify function and non-functions using equations, tables, and graphs. ● Categorize functions as linear or nonlinear. ● Construct a function to model a linear situation. ● Determine the rate of change and initial value from tables, graphs, equations, or verbal descriptions. ● Sketch a graph to model a given situation.

Key Academic Vocabulary	
Review: ● Input ● Output ● Substitution ● Infinitely many solutions ● No solution	**New:** ● Hypotenuse / Legs ● Rise / Run ● Slope ● Unit Rate ● Linear Equation ● Continuous / Discrete graphs ● Domain ● Function ● Range ● Vertical Line test ● Linear / Nonlinear functions ● Slope-Intercept Form ● x and y-intercepts ● System of equation

Interdisciplinary Connections

2023 New Jersey Student Learning Standards for English Language Arts

Grade 8 Reading

RI.CR.8.1. Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and diagrams) that strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.

RI.MF.8.6. Evaluate the choices made (by the authors, directors, or actors) when presenting an idea in different mediums and the advantages and disadvantages of using different mediums or formats (e.g., visually, quantitatively) to address a question or solve a problem.

RI.AA.8.7. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

Grade 8 Writing

W.IW.8.2. Write informative/explanatory texts (including the narration of historical events, scientific procedures/ experiments, or technical processes) to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

W.SE.8.6. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

Grade 8 Speaking and Listening

SL.PE.8.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.
SL.II.8.2. Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

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.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.

2020 New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills

NJSLS 9.1 Financial Literacy

9.1.8.FP.1: Describe the impact of personal values on various financial scenarios.
9.1.8.FP.3: Explain how self-regulation is important to managing money (e.g., delayed

gratification, impulse buying, peer pressure, etc.).
9.1.8.FI.4: Analyze the interest rates and fees associated with financial products.
9.1.8.EG.1: Explain how taxes affect disposable income and the difference between net and gross income.
9.1.8.PB.4: Construct a simple personal savings and spending plan based on various sources of income and different stages of life (e.g. teenager, young adult, family).
9.1.8.PB.6: Construct a budget to save for short-term, long term, and charitable goals.
9.1.8.CP.2: Analyze how spending habits affect one's ability to save.

NJSLS 9.2 Career Awareness, Exploration, Preparation and Training

9.2.8.CAP.6: Compare the costs of postsecondary education with the potential increase in income from a career of choice.
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.

NJSLS 9.4 Life Literacies and Key Skills

9.4.8.GCA.1: Model how to navigate cultural differences with sensitivity and respect.
9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations.
9.4.8.IML.7: Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose.
9.4.8.IML.8: Apply deliberate and thoughtful search strategies to access high-quality information on climate change.
9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem.
9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Student Resources
Texts: Houghton Mifflin Harcourt **Into Math**, Grade 8, 1st edition, 2020, ISBN: 978-0-358-11604-2. **Resources: Into Math,** Grade 8 ● More Practice / Homework ● Reteach and Interactive Reteach ● Challenge and Interactive Challenge ● Anchor-Charts **Websites:** ● https://www.hmhco.com/ui/login Into Math ● http://khanacademy.org Tutorials on individual lessons ● https://edpuzzle.com/ Video learning ● https://quizizz.com/?lng=en Assessment and practice ● https://www.desmos.com/ Online Graphing Calculator & Activities

Integrated Technology

- Google Suite: Docs, Sheets, Slides, Forms
- Into Math online program
- Devices:
  - Chromebooks
  - Texas Instruments (TI-30X Calculators)
  - SMART / Promethean Interactive Boards

Teacher Resources

Texts: Houghton Mifflin Harcourt, **Into Math,** Grade 8, 1st edition, 2020, ISBN: 978-0-358-11634-9**.**

Resources:

- **Into Math:**
  - Unit STEM Task Cards
  - Online Data-Driven Interventions
  - More Practice / Homework
  - Illustrative Mathematics
  - Reteach and Interactive Reteach
  - Challenge and Interactive Challenge
  - Mini-Lesson Tabletop Flipchart
  - Math Vocabulary: http://partnersforlearning.org/wp-content/uploads/2014/09/Common-Core-Academic-Vocabulary-Mathematics-K-12.pdf

Websites:

- https://www.hmhco.com/ui/login Into Math Interactive
- http://khanacademy.org Tutorials on individual lessons
- http://www.kutasoftware.com Test and worksheet generator for teachers

- New Jersey Climate Education Hub

Integrated Technology:

- Google Suite: Docs, Sheets, Slides, Forms
- Into Math online program
- Devices:
  - SMART/ Promethean Interactive Board
  - Chromebooks
  - Texas Instruments (TI-30X Calculators)

Stage 2 – Assessment Evidence
Performance Task(s): ● **Unit STEM activity:** *Which Car Costs Less?* ● Illustrative Mathematics ● Interactive Reteach ● Interactive Challenge ● NJSLA practice test problems: https://nj.mypearsonsupport.com/practice-tests/math/ **Pre-Assessments:** ● Gr 8 Math BOY Assessment - *LinkIt!* ● *Are You Ready?* **Formative Assessments:** ● Gr 8 Math BOY Assessment - *LinkIt!* ● Exit Slip ● Student *"I Can"* Self-Assessment ● Informal Observations ● Homework **Summative Assessments:** ● Lesson quizzes ● Module Tests A and B ● Gr 8 Math MOY Assessment - *LinkIt!* ● NJDOE Digital Item Library- Released NJSLA items ● Gr 8 Math EOY Assessment - *LinkIt!*

Stage 3 – Learning Plan
STEM Task: ***Which Car Costs Less?*** **Learning Mindset:** ***Challenge Seeking*** **Module Opener:** ● **Module 5:** ***Proportional Smoothies*** ● **Module 6:** ***Bead or No Bead*** ● **Module 7:** ***Wags Per Mile*** **Diagnostic Assessment:** ***Are You Ready?*** **Module 5: Proportional Relationships** ● **Lesson 5.1:** Explain Slope with Similar Triangles ● **Lesson 5.2:** Derive $y = mx$ ● **Lesson 5.3:** Interpret and Graph Proportional Relationships ● **Lesson 5.4:** Compare Proportional Relationships

Module 6: Understand and Analyze Functions

- **Lesson 6.1:** Understand and Graph Functions
- **Lesson 6.2:** Derive and Interpret $y = mx + b$
- **Lesson 6.3:** Interpret Rate of Change and Initial Value
- **Lesson 6.4:** Construct Functions
- **Lesson 6.5:** Compare Functions
- **Lesson 6.6:** Describe and Sketch Nonlinear Functions

Module 7: Systems of Linear Equations

- **Lesson 7.1:** Represent Systems by Graphing
- **Lesson 7.2:** Solve Systems by Graphing
- **Lesson 7.3:** Solve Systems by Substitution
- **Lesson 7.4:** Solve Systems by Elimination
- **Lesson 7.5:** Examine Special Systems
- **Lesson 7.6:** Apply Systems of Equations

Unit Plan Title	**Unit 4: Statistics and Probability**
Suggested Time Frame	**17 Days**

Overview / Rationale
Students display and analyze data with two variables. Trend lines will be used to describe a linear relationship between two variables. Students will use scatter plots and trend lines to interpret linear data in context. Students will interpret data by constructing two way frequency tables. ● **Module 8:** Students will construct and analyze scatter plots and their trends. ● **Module 9:** Students will construct and analyze two-way tables.

STAGE 1: Desired Results

New Jersey Student Learning Standards for Mathematics (2023)
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. **(Students may Investigate patterns of association in bivariate data involving the amount of a greenhouse gas in the atmosphere and its effect on temperature.)** **8.SP.A.2** Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (e.g. line of best fit) by judging the closeness of the data points to the line. **8.SP.A.3** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height. **(Students may use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept involving the physical properties of the principle gasses that cause climate change.)** **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. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?

Standards for Mathematical Practice

- Make sense of problems and persevere in solving them.
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- 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 we gather, organize and display data to communicate and justify results in the real world? • How can we analyze data to make inferences and/or predictions, based on surveys, experiments, probability and observational studies?	• Scatter plots can be used to identify patterns for bivariate data. • A straight line can be used to identify a linear association in scatter plots. • A linear equation can be used to model situations. • Conditional relative frequency can be seen if there is an association between two variables.
Learning Targets: Knowledge *Students will know…*	**Learning Targets: Skills** *Students will be able to…*
• Scatter plots are used for bivariate measurement data. • Linear association can be shown by a trend line. • An equation can be written to represent bivariate data. • Two way tables summarize data for two categorical variables. • There can be positive, negative, or no association for bivariate data.	• Construct and interpret scatter plots. • Investigate patterns between bivariate data. • Identify a trend line. • Use a trend line to solve problems. • Construct and interpret a two way table. • Use relative frequencies to describe possible association between variables. • Sketch a graph to model a given situation.

Key Academic Vocabulary	
Review: ● Slope ● Y intercept ● Slope intercept form ● Variable	**New:** ● Association ● Cluster ● Linear association ● Negative association ● No association ● Nonlinear association ● Outlier ● Positive association ● Scatter plot ● Trend line ● Two way table ● joint relative frequency ● Marginal relative frequency ● Relative frequency ● Two-way relative frequency table ● Conditional relative frequency

Interdisciplinary Connections

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RI.MF.8.6. Evaluate the choices made (by the authors, directors, or actors) when presenting an idea in different mediums and the advantages and disadvantages of using different mediums or formats (e.g., visually, quantitatively) to address a question or solve a problem.

RI.AA.8.7. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

<u>Grade 8 Writing</u>

W.IW.8.2. Write informative/explanatory texts (including the narration of historical events, scientific procedures/ experiments, or technical processes) to examine a topic and

convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

W.SE.8.6. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

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2020 New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills

NJSLS 9.1 Financial Literacy

9.1.8.FP.1: Describe the impact of personal values on various financial scenarios.

9.1.8.PB.2: Explain how different circumstances can affect one's personal budget.
9.1.8.CP.1: Compare prices for the same goods or services.
9.1.8.CP.2: Analyze how spending habits affect one's ability to save.

NJSLS 9.2 Career Awareness, Exploration, Preparation and Training

9.2.8.CAP.6: Compare the costs of postsecondary education with the potential increase in income from a career of choice.
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.

NJSLS 9.4 Life Literacies and Key Skills

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.
9.4.8.IML.11: Predict the personal and community impact of online and social media activities.
9.4.8.IML.14: Analyze the role of media in delivering cultural, political, and other societal messages.
9.4.8.TL.5: Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.

Student Resources

Texts: Houghton Mifflin Harcourt **Into Math**, Grade 8**,** 1st edition, 2020, ISBN: 978-0-358-11604-2.

Resources: Into Math, Grade 8

- More Practice / Homework
- Reteach and Interactive Reteach
- Challenge and Interactive Challenge
- Anchor-Charts

Websites:

- https://www.hmhco.com/ui/login Into Math
- http://khanacademy.org Tutorials on individual lessons
- https://edpuzzle.com/ Video learning
- https://quizizz.com/?lng=en Assessment and practice
- https://www.desmos.com/ Online Graphing Calculator & Activities

Integrated Technology

- Google Suite: Docs, Sheets, Slides, Forms
- Into Math online program
- Devices:
  - Chromebooks

- Texas Instruments (TI-30X Calculators)
- SMART / Promethean Interactive Board

Teacher Resources

Texts: Houghton Mifflin Harcourt, **Into Math,** Grade 8, 1st edition, 2020, ISBN: 978-0-358-11634-9**.**

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  - More Practice / Homework
  - Illustrative Mathematics
  - Reteach and Interactive Reteach
  - Challenge and Interactive Challenge
  - Mini-Lesson Tabletop Flipchart
  - Math Vocabulary: http://partnersforlearning.org/wp-content/uploads/2014/09/Common-Core-Academic-Vocabulary-Mathematics-K-12.pdf

Websites:

- https://www.hmhco.com/ui/login Into Math Interactive
- http://khanacademy.org Tutorials on individual lessons
- http://www.kutasoftware.com Test and worksheet generator for teachers

- New Jersey Climate Education Hub

Integrated Technology:

- Google Suite: Docs, Sheets, Slides, Forms
- Into Math online program
- Devices:
  - SMART/ Promethean Interactive Board
  - Chromebooks
  - Texas Instruments (TI-30X Calculators)

Stage 2 – Assessment Evidence

Performance Task(s):

- **Unit STEM activity:** *Altitude or Latitude?*
- Illustrative Mathematics
- Interactive Reteach
- Interactive Challenge
- NJSLA practice test problems: https://nj.mypearsonsupport.com/practice-tests/math/

Pre-Assessments:

- Gr 8 Math BOY Assessment - *LinkIt!*

- *Are You Ready?*

Formative Assessments:

- Gr 8 Math BOY Assessment - *LinkIt!*
- Exit Slip
- Student *"I Can"* Self-Assessment
- Informal Observations
- Homework

Summative Assessments:

- Lesson quizzes
- Module Tests A and B
- Gr 8 Math MOY Assessment - *LinkIt!*
- NJDOE Digital Item Library- Released NJSLA items
- Gr 8 Math EOY Assessment - *LinkIt!*

Stage 3 – Learning Plan
STEM Task: ***Altitude or Latitude***
Learning Mindset: ***Challenge Seeking***
Module Opener: • **Module 8:** ***Taken for a Ride*** • **Module 9:** ***Build a Deck***
Diagnostic Assessment: ***Are You Ready?***
Module 8: Scatter Plots • **Lesson 8.1:** Construct Scatter Plots and Examine Association • **Lesson 8.2:** Draw and Analyze Trend Lines • **Lesson 8.3:** Interpret Linear Data in Context
Module 9: Two-Way Tables • **Lesson 9.1:** Construct and Interpret Two-Way Frequency Tables • **Lesson 9.2:** Construct Two-Way Relative Frequency Tables • **Lesson 9.3:** Interpret Two-Way Relative Frequency Tables

Unit Plan Title	**Unit 5: Real Number and the Pythagorean Theorem**
Suggested Time Frame	**22 Days**

Overview / Rationale

Students determine if a number is rational. Students will evaluate square roots and cube roots. They will order a list of real numbers consisting of both rational and irrational numbers. Students will prove and use Pythagorean theorem and its converse. Students will use Pythagorean Theorem to solve real world problems involving right triangles and find distance between two points in a coordinate plane.

- **Module 10:** Students will investigate real numbers.
- **Module 11:** Students will prove the Pythagorean Theorem and its converse.

STAGE 1: Desired Results

New Jersey Student Learning Standards for Mathematics (2023)

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

8.NS.A.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.

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

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

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

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

8.EE.A.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$ where p is a positive rational number.

a. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
b. **Simplify numerical radicals, limiting to square roots (i.e. non perfect squares). For example, simplify $\sqrt{8}$ to $2\sqrt{2}$.**

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…*
● What is a rational number? ● How can Pythagorean Theorem be used to solve problems? ● How can you find the shortest distance between two points? ● How do numbers relate and compare to one another?	● Rational and irrational numbers can be plotted on a number line. ● Non-perfect squares and cubes are irrational. ● Taking the square root is the inverse of squaring a number. ● The sum of the squares of the legs of a right triangle are equal to the square of the hypotenuse. ● Pythagorean Theorem can be used to find the distance between two points on a coordinate plane by using the vertical and horizontal distances.
Learning Targets: Knowledge *Students will know…*	**Learning Targets: Skills** *Students will be able to…*
● Rational numbers can be represented as a fraction. ● Rational numbers can be represented by repeating or terminating decimals. ● Rational and irrational numbers can be ordered. ● Pythagorean theorem can be used to find an unknown side of a right triangle. ● Pythagorean Theorem can be used to find the distance between two points.	● Write rational numbers as decimals or fractions. ● Evaluate square roots and cube roots and solve problems. ● Identify decimal estimates of imperfect square roots and cube roots. ● Compare numerical expressions involving roots. ● Order rational and irrational numbers. ● Prove Pythagorean Theorem. ● Use Pythagorean Theorem to find missing sides of right triangles and the distance between two points on a coordinate plane.

Key Academic Vocabulary	
Review: ● Circumference ● Diameter ● Greatest Common Factor ● Numerator ● Power ● Rational number ● Squares ● Cubes ● Number Line ● Height ● Radius	**New:** ● Irrational numbers ● Rational number ● Pi ● Repeating decimal ● Terminating decimal ● Cube root ● Perfect cube ● Perfect square ● Principal square root ● Radical symbol ● Square root ● Real numbers ● Pythagorean Theorem ● Pythagorean Triple ● Converse

Interdisciplinary Connections

2023 New Jersey Student Learning Standards for English Language Arts

Grade 8 Reading

RI.CR.8.1. Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and diagrams) that strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.

RI.MF.8.6. Evaluate the choices made (by the authors, directors, or actors) when presenting an idea in different mediums and the advantages and disadvantages of using different mediums or formats (e.g., visually, quantitatively) to address a question or solve a problem.

RI.AA.8.7. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

Grade 8 Writing

W.IW.8.2. Write informative/explanatory texts (including the narration of historical events, scientific procedures/ experiments, or technical processes) to examine a topic and

convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

W.SE.8.6. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

Grade 8 Speaking and Listening

SL.PE.8.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

SL.II.8.2. Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

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.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.

2020 New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills

NJSLS 9.2 Career Awareness, Exploration, Preparation and Training

9.2.8.CAP.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.

9.2.8.CAP.15: Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.
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.

NJSLS 9.4 Life Literacies and Key Skills

9.4.8.GCA.1: Model how to navigate cultural differences with sensitivity and respect.
9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.

Student Resources

Texts: Houghton Mifflin Harcourt **Into Math**, Grade 8, 1st edition, 2020, ISBN: 978-0-358-11604-2.
 	
Resources: Into Math, Grade 8
● More Practice / Homework
● Reteach and Interactive Reteach
● Challenge and Interactive Challenge
 	
Websites:
● https://www.hmhco.com/ui/login Into Math
● http://khanacademy.org Tutorials on individual lessons
● https://edpuzzle.com/ Video learning
● https://quizizz.com/?lng=en Assessment and practice
● https://www.desmos.com/ Online Graphing Calculator & Activities
 	
Integrated Technology
● Google Suite: Docs, Sheets, Slides, Forms
● Into Math online program
● Devices:
  ● Chromebooks
  ● Texas Instruments (TI-30X Calculators)
  ● SMART / Promethean Interactive Boards

Teacher Resources

Texts: Houghton Mifflin Harcourt, **Into Math,** Grade 8, 1st edition, 2020, ISBN: 978-0-358-11634-9**.**
 	
Resources:
● **Into Math:**
  ○ Unit STEM Task Cards
  ○ Online Data-Driven Interventions
  ○ More Practice / Homework
  ○ Illustrative Mathematics
  ○ Reteach and Interactive Reteach

- Challenge and Interactive Challenge
- Mini-Lesson Tabletop Flipchart
- Math Vocabulary: http://partnersforlearning.org/wp-content/uploads/2014/09/Common-Core-Academic-Vocabulary-Mathematics-K-12.pdf

Websites:

- https://www.hmhco.com/ui/login Into Math Interactive
- http://khanacademy.org Tutorials on individual lessons
- http://www.kutasoftware.com Test and worksheet generator for teachers
- New Jersey Climate Education Hub

Integrated Technology:

- Google Suite: Docs, Sheets, Slides, Forms
- Into Math online program
- Devices:
  - SMART/ Promethean Interactive Board
  - Chromebooks
  - Texas Instruments (TI-30X Calculators)

Stage 2 – Assessment Evidence

Performance Task(s):

- **Unit STEM activity:** *The Wheel of Theodorus*
- Illustrative Mathematics
- Interactive Reteach
- Interactive Challenge
- NJSLA practice test problems: https://nj.mypearsonsupport.com/practice-tests/math/

Pre-Assessments:

- Gr 8 Math BOY Assessment - *LinkIt!*
- *Are You Ready?*

Formative Assessments:

- Gr 8 Math BOY Assessment - *LinkIt!*
- Exit Slip
- Student *"I Can"* Self-Assessment
- Informal Observations
- Homework

Summative Assessments:

- Lesson quizzes
- Module Tests A and B
- Gr 8 Math MOY Assessment - *LinkIt!*
- NJDOE Digital Item Library- Released NJSLA items
- Gr 8 Math EOY Assessment - *LinkIt!*

Stage 3 – Learning Plan
STEM Task: ***The Wheel of Theodorus***   **Learning Mindset:** ***Resilience***   **Module Opener:** ● **Module 10:** ***Track the Distance*** ● **Module 11:** ***Try Your Angle***   **Diagnostic Assessment:** ***Are You Ready?***   **Module 10: Real Numbers** ● **Lesson 10.1:** Understand Rational and Irrational Numbers ● **Lesson 10.2:** Investigate Roots ● **Lesson 10.3:** Order Real Numbers   **Module 11: Pythagorean Theorem** ● **Lesson 11.1:** Prove the Pythagorean Theorem ● **Lesson 11.2:** Prove the Converse of the Pythagorean Theorem ● **Lesson 11.3:** Apply the Pythagorean Theorem ● **Lesson 11.4** Apply the Pythagorean Theorem in the Coordinate Plane

Unit Plan Title	**Unit 6: Exponents, Scientific Notation and Volume**
Suggested Time Frame	**25 Days**

Overview / Rationale

Students develop and use the properties of integer exponents. Numbers both large and small will be expressed using scientific notation. Students will be able to compute numbers written in scientific notation. Students will develop and use the formula for volume of a cylinder, cone, and sphere. They will use volume formulas to solve problems involving cylinders, cones, and spheres.

- **Module 12:** Students will apply properties of exponents and compute with scientific notation.
- **Module 13:** Students will find and apply volume to cylinders, cones, and spheres.

STAGE 1: Desired Results

New Jersey Student Learning Standards for Mathematics (2023)

8.EE.A.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = \frac{1}{3}^3 = \frac{1}{27}$.

8.EE.A.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger.

8.EE.A.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. **(Students may solve real-world mathematical problems involving the physical properties of the principle gasses that cause climate change molecules.)**

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 do you use patterns to understand mathematics and model situations? ● How can we communicate and generalize algebraic relationships? ● How can geometric ideas be communicated? ● How can geometry be used to solve problems about real-world situations and spatial relationships?	● The properties of exponents. ● The exponent affects one base unless there is a parenthesis. ● Place value of a given number. ● If an exponent for scientific notation increases by 1 the value increases by 10. ● The relationships between the volume of cylinders, cubes, and spheres.
Learning Targets: Knowledge *Students will know…*	**Learning Targets: Skills** *Students will be able to…*
● Product of powers involves adding exponents of the same base. ● Quotient of powers involves subtracting exponents of the same base. ● Power of powers involves multiplying exponents. ● Scientific notation consists of a number between 1 and 10 multiplied by a power of 10. ● Scientific notation can be written in standard form. ● Volume represents the space inside of a 3-d figure.	● Develop and use the properties of integer exponents. ● Generate equivalent numerical expressions using exponents. ● Translate between standard notation and scientific notation or vice versa. ● Compute with numbers written in scientific notation. ● Develop and use the formula for volume of a cylinder. ● Develop and use formula for volume of a cone. ● Develop and use the formula for volume of a sphere. ● Use volume formulas to solve real-world problems involving cylinders, cones, and spheres.

Key Academic Vocabulary	
Review: ● Base ● Exponent ● Cylinder ● Volume ● Cubic	**New:** ● Properties of Exponents ● Scientific notation ● Standard form ● Slant height ● sphere

Interdisciplinary Connections

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Grade 8 Reading

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Grade 8 Writing

W.IW.8.2. Write informative/explanatory texts (including the narration of historical events, scientific procedures/ experiments, or technical processes) to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

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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.

2020 New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills

NJSLS 9.1 Financial Literacy

9.1.8.FP.1: Describe the impact of personal values on various financial scenarios.

9.1.8.EG.1: Explain how taxes affect disposable income and the difference between net and gross income.

9.1.8.CP.1: Compare prices for the same goods or services.

NJSLS 9.2 Career Awareness, Exploration, Preparation and Training

9.2.8.CAP.15: Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.
9.2.8.CAP.18: Explain how personal behavior, appearance, attitudes, and other choices may impact the job application process.
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.

NJSLS 9.4 Life Literacies and Key Skills

9.4.8.GCA.1: Model how to navigate cultural differences with sensitivity and respect.
9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations.
9.4.8.IML.6: Identify subtle and overt messages based on the method of communication.
9.4.8.TL.5: Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.
9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.

Student Resources

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- http://khanacademy.org Tutorials on individual lessons
- https://edpuzzle.com/ Video learning
- https://quizizz.com/?lng=en Assessment and practice
- https://www.desmos.com/ Online Graphing Calculator & Activities

Integrated Technology

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Stage 2 – Assessment Evidence

Performance Task(s):

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- Module Tests A and B
- Gr 8 Math MOY Assessment - *LinkIt!*
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- Gr 8 Math EOY Assessment - *LinkIt!*

Stage 3 – Learning Plan
STEM Task: ***The Large and Small of It***   **Learning Mindset: Strategic Help Seeking**   **Module Opener:** ● **Module 12: A-Mazing Expressions** ● **Module 13: Reduce the Juice**   **Diagnostic Assessment:** *Are You Ready?*   **Module 12: Exponents and Scientific Notation** ● **Lesson 12.1:** Know and Apply Properties of Exponents ● **Lesson 12.2:** Understand Scientific Notation ● **Lesson 12.3:** Compute with Scientific Notation   **Module 13: Volume** ● **Lesson 13.1:** Find Volume of Cylinders ● **Lesson 13.2:** Find Volume of Cones ● **Lesson 13.3:** Find Volume of Spheres ● **Lesson 13.4:** Apply Volume

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

Multilingual 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: http://visual.merriamwebster.com/.
- Use online translator to assist students with pronunciation: http://www.reverso.net/text_translation.aspx?lang=EN.

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 topic(s) 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: http://cooperativelearningstrategies.pbworks.com/w/page/28234420/Corners.
- 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: http://www.adlit.org/strategies/22371/.

PACING GUIDE

SEPTEMBER								
Day	**Unit**	**LESSON**	**NJSLS**		**Day**	**Unit**	**LESSON**	**NJSLS**
1		Introduction to Course			13	1	Module 1	8.G.A.1b, 8.G.A.1a, 8.G.A.1c, 8.G.A.1, 8.G.A.3, 8.G.A.2
2		Link-it! Pre-Assessment			14	1	Module 1	8.G.A.1b, 8.G.A.1a, 8.G.A.1c, 8.G.A.1, 8.G.A.3, 8.G.A.2
3		Link-it! Pre-Assessment			15	1	Module 1	8.G.A.1b, 8.G.A.1a, 8.G.A.1c, 8.G.A.1, 8.G.A.3, 8.G.A.2
4	1	Unit 1 STEM Task	8.G.A.1b, 8.G.A.1a, 8.G.A.1c, 8.G.A.1, 8.G.A.3, 8.G.A.2		16	1	Module 1	8.G.A.1b, 8.G.A.1a, 8.G.A.1c, 8.G.A.1, 8.G.A.3, 8.G.A.2
5	1	Module 1	8.G.A.1b, 8.G.A.1a, 8.G.A.1c, 8.G.A.1, 8.G.A.3, 8.G.A.2		17	1	Module 1	8.G.A.1b, 8.G.A.1a, 8.G.A.1c, 8.G.A.1, 8.G.A.3, 8.G.A.2
6	1	Module 1	8.G.A.1b, 8.G.A.1a, 8.G.A.1c, 8.G.A.1, 8.G.A.3, 8.G.A.2		18	1	Module 2	8.G.A.3 , 8.G.A.4
7	1	Module 1	8.G.A.1b, 8.G.A.1a, 8.G.A.1c, 8.G.A.1, 8.G.A.3, 8.G.A.2					
8	1	Module 1	8.G.A.1b, 8.G.A.1a, 8.G.A.1c, 8.G.A.1, 8.G.A.3, 8.G.A.2					
9	1	Module 1	8.G.A.1b, 8.G.A.1a, 8.G.A.1c, 8.G.A.1, 8.G.A.3, 8.G.A.2					
10	1	Module 1	8.G.A.1b, 8.G.A.1a, 8.G.A.1c, 8.G.A.1, 8.G.A.3, 8.G.A.2					
11	1	Module 1	8.G.A.1b, 8.G.A.1a, 8.G.A.1c, 8.G.A.1, 8.G.A.3, 8.G.A.2					
12	1	Module 1	8.G.A.1b, 8.G.A.1a, 8.G.A.1c, 8.G.A.1, 8.G.A.3, 8.G.A.2					
OCTOBER								
Day	**Unit**	**LESSON**	**NJSLS**		**Day**	**Unit**	**LESSON**	**NJSLS**
19	1	Module 2	8.G.A.3 , 8.G.A.4		31	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a
20	1	Module 2	8.G.A.3 , 8.G.A.4		32	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a
21	1	Module 2	8.G.A.3 , 8.G.A.4		33	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a
22	1	Module 2	8.G.A.3 , 8.G.A.4		34	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a
23	1	Module 2	8.G.A.3 , 8.G.A.4		35	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a
24	1	Module 2	8.G.A.3 , 8.G.A.4		36	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a
25	1	Module 2	8.G.A.3 , 8.G.A.4		37	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a
26	1	Module 2	8.G.A.3 , 8.G.A.4		38	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a
27	2	Unit 2 STEM Task	8.EE.C.7b, 8.EE.C.7		39	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a
28	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a					
29	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a					
30	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a					
NOVEMBER								
Day	**Unit**	**LESSON**	**NJSLS**		**Day**	**Unit**	**LESSON**	**NJSLS**
40	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a		52	3	Unit 3 STEM Task	8.EE.B.5, 8.F.B.5, 8.F.B.4
41	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a		53	3	Module 5	8.EE.B.6, 8.EE.B.5
42	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a		54	3	Module 5	8.EE.B.6, 8.EE.B.5

43	2	Module 3	8.EE.C.7b, 8.EE.C.7, 8.EE.C.7a					
44	2	Module 4	8.G.A.5					
45	2	Module 4	8.G.A.5					
46	2	Module 4	8.G.A.5					
47	2	Module 4	8.G.A.5					
48	2	Module 4	8.G.A.5					
49	2	Module 4	8.G.A.5					
50	2	Module 4	8.G.A.5					
51	2	Module 4	8.G.A.5					
DECEMBER								
Day	**Unit**	**LESSON**	**NJSLS**		**Day**	**Unit**	**LESSON**	**NJSLS**
55	3	Module 5	8.EE.B.6, 8.EE.B.5		67	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5
56	3	Module 5	8.EE.B.6, 8.EE.B.5		68	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5
57	3	Module 5	8.EE.B.6, 8.EE.B.5		69	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5
58	3	Module 5	8.EE.B.6, 8.EE.B.5		70	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5
59	3	Module 5	8.EE.B.6, 8.EE.B.5					
60	3	Module 5	8.EE.B.6, 8.EE.B.5					
61	3	Module 5	8.EE.B.6, 8.EE.B.5					
62	3	Module 5	8.EE.B.6, 8.EE.B.5					
63	3	Module 5	8.EE.B.6, 8.EE.B.5					
64	3	Module 5	8.EE.B.6, 8.EE.B.5					
65	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5					
66	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5					
JANUARY								
Day	**Unit**	**LESSON**	**NJSLS**		**Day**	**Unit**	**LESSON**	**NJSLS**
71	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5		83	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c
72	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5		84	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c
73	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5		85	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c
74	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5		86	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c
75	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5		87		Benchmark Exam Review	
76	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5		88		Benchmark Exam Review	
77	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5					
78	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5					
79	3	Module 6	8.F.A.1, 8.EE.B.6, 8.F.A.3, 8.F.B.4, 8.F.A.2, 8.F.B.5					
80	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c					
81	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c					
82	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c					

FEBRUARY								
Day	**Unit**	**LESSON**	**NJSLS**		**Day**	**Unit**	**LESSON**	**NJSLS**
89		Benchmark Exam			101	4	Unit 4 STEM Task	8.SP.A.1, 8.SP.A.2
90	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c		102	4	Module 8	8.SP.A.1, 8.SP.A.2, 8.F.B.4
91	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c		103	4	Module 8	8.SP.A.1, 8.SP.A.2, 8.F.B.4
92	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c		104	4	Module 8	8.SP.A.1, 8.SP.A.2, 8.F.B.4
93	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c		105	4	Module 8	8.SP.A.1, 8.SP.A.2, 8.F.B.4
94	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c		106	4	Module 8	8.SP.A.1, 8.SP.A.2, 8.F.B.4
95	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c		107	4	Module 8	8.SP.A.1, 8.SP.A.2, 8.F.B.4
96	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c					
97	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c					
98	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c					
99	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c					
100	3	Module 7	8.EE.C.8, 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c					
MARCH								
Day	**Unit**	**LESSON**	**NJSLS**		**Day**	**Unit**	**LESSON**	**NJSLS**
108	4	Module 8	8.SP.A.1, 8.SP.A.2, 8.F.B.4		120	5	Module 10	8.NS.A.1, 8.E, E.A.2, 8.NS.A.2
109	4	Module 8	8.SP.A.1, 8.SP.A.2, 8.F.B.4		121	5	Module 10	8.NS.A.1, 8.E, E.A.2, 8.NS.A.2
110	4	Module 9	8.SP.A.4		122	5	Module 10	8.NS.A.1, 8.E, E.A.2, 8.NS.A.2
111	4	Module 9	8.SP.A.4		123	5	Module 10	8.NS.A.1, 8.E, E.A.2, 8.NS.A.2
112	4	Module 9	8.SP.A.4		124	5	Module 10	8.NS.A.1, 8.E, E.A.2, 8.NS.A.2
113	4	Module 9	8.SP.A.4		125	5	Module 10	8.NS.A.1, 8.E, E.A.2, 8.NS.A.2
114	4	Module 9	8.SP.A.4		126	5	Module 10	8.NS.A.1, 8.E, E.A.2, 8.NS.A.2
115	4	Module 9	8.SP.A.4		127	5	Module 10	8.NS.A.1, 8.E, E.A.2, 8.NS.A.2
116	4	Module 9	8.SP.A.4					
117	4	Module 9	8.SP.A.4					
118	5	Unit 5 STEM Task	8.NS.A.1, 8.E, E.A.2, 8.NS.A.2					
119	5	Module 10	8.NS.A.1, 8.E, E.A.2, 8.NS.A.2					
APRIL								
Day	**Unit**	**LESSON**	**NJSLS**		**Day**	**Unit**	**LESSON**	**NJSLS**
128		NJSLA Review			140	5	Module 11	8.G.B.7, 8.G.B.6, 8.G.B.8
129		NJSLA Review			141	5	Module 11	8.G.B.7, 8.G.B.6, 8.G.B.8
130		NJSLA Administration			142	5	Module 11	8.G.B.7, 8.G.B.6, 8.G.B.8
131		NJSLA Administration			143	5	Module 11	8.G.B.7, 8.G.B.6, 8.G.B.8
132		NJSLA Administration						
133		NJSLA Administration						
134		NJSLA Administration						
135		NJSLA Administration						
136	5	Module 11	8.G.B.7, 8.G.B.6, 8.G.B.8					
137	5	Module 11	8.G.B.7, 8.G.B.6, 8.G.B.8					
138	5	Module 11	8.G.B.7, 8.G.B.6, 8.G.B.8					

139	5	Module 11	8.G.B.7, 8.G.B.6, 8.G.B.8					
MAY								
Day	**Unit**	**LESSON**	**NJSLS**		**Day**	**Unit**	**LESSON**	**NJSLS**
144	5	Module 11	8.G.B.7, 8.G.B.6, 8.G.B.8		156	6	Module 12	8.EE.A.1, 8.EE.A.3, 8.EE.A.4
145	5	Module 11	8.G.B.7, 8.G.B.6, 8.G.B.8		157	6	Module 12	8.EE.A.1, 8.EE.A.3, 8.EE.A.4
146	5	Module 11	8.G.B.7, 8.G.B.6, 8.G.B.8		158	6	Module 12	8.EE.A.1, 8.EE.A.3, 8.EE.A.4
147	5	Module 11	8.G.B.7, 8.G.B.6, 8.G.B.8		159	6	Module 12	8.EE.A.1, 8.EE.A.3, 8.EE.A.4
148	6	Unit 6 STEM Task	8.EE.A.3, 8.EE.A.1		160	6	Module 12	8.EE.A.1, 8.EE.A.3, 8.EE.A.4
149	6	Module 12	8.EE.A.1, 8.EE.A.3, 8.EE.A.4		161	6	Module 13	8.G.C.9
150	6	Module 12	8.EE.A.1, 8.EE.A.3, 8.EE.A.4		162	6	Module 13	8.G.C.9
151	6	Module 12	8.EE.A.1, 8.EE.A.3, 8.EE.A.4		163	6	Module 13	8.G.C.9
152	6	Module 12	8.EE.A.1, 8.EE.A.3, 8.EE.A.4		164	6	Module 13	8.G.C.9
153	6	Module 12	8.EE.A.1, 8.EE.A.3, 8.EE.A.4		165	6	Module 13	8.G.C.9
154	6	Module 12	8.EE.A.1, 8.EE.A.3, 8.EE.A.4					
155	6	Module 12	8.EE.A.1, 8.EE.A.3, 8.EE.A.4					
JUNE								
Day	**Unit**	**LESSON**	**NJSLS**		**Day**	**Unit**	**LESSON**	**NJSLS**
166	6	Module 13	8.G.C.9		178		Project-Based Activities	
167	6	Module 13	8.G.C.9		179		Project-Based Activities	
168	6	Module 13	8.G.C.9		180		Project-Based Activities	
169	6	Module 13	8.G.C.9					
170	6	Module 13	8.G.C.9					
171	6	Module 13	8.G.C.9					
172	6	Module 13	8.G.C.9					
173		EOY Exam Review						
174		EOY Exam Review						
175		EOY Exam						
176		EOY Exam						
177		Project-Based Activities						

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