SPARTA TWP. PUBLIC SCHOOLS

Grade 7 Pre-Algebra

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Adapted from:
New Jersey Student Learning Standards

Reviewed by:
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Adopted:
August 2019

Last Updated:
July 2019

Sparta Township School District
18 Mohawk Avenue
Sparta, NJ 07871
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VISION

The Sparta School district believes that the Sparta school system produces students who will exemplify mastery in mathematical practices. It is the responsibility of administrators, teachers, students, and parents to create learning opportunities to persevere in modeling mathematics precisely and strategically with reasoning, tools, and algebraic structure. Through this collaboration, students will develop into independent, competent, mathematical thinkers who are college and career ready.

BELIEF STATEMENTS

- Technology can enhance the learning process and prepare students to be 21st century learners.
- Student-centered learning activities will enable students to develop ownership for their education.
- A coherent K-12 curriculum will allow for authentic real-world learning opportunities.
- Our assessments will require students to demonstrate in-depth understanding rather than recalling simple facts and algorithms.
- Students will be confident in participating in higher level discussions that will assess and advance the understanding of concepts.
- The use of various resources, tools, and technology will engage students to solve mathematically rich, real-world problems that meet the needs of a diverse population of learners.
- Collaborative and hands-on learning activities will promote creative and critical thinking skills for all students.

COURSE OVERVIEW

The Sparta School District Pre-Algebra program has been constructed within a multi-faceted, standards-based Philosophy. In this course, students will extend their knowledge of equations and functions to manipulate equations using properties of operations and model and solve real-world problems. Students will develop an understanding of linear, quadratic, and exponential equations and extend this thinking to include systems of equations.

COMPONENTS OF THE COURSE

The Components of a successful Pre-Algebra program are:

- Learnzillion
- Illustrative Mathematics
- EngageNY
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SCOPE AND SEQUENCE

(Pacing Guide)

Weeks Taught *(40 Total)*	**Units of Study**
4	Rational Number Operations
2	Roots and the Real Number System
3	Exponents and Scientific Notation
6	Expressions, Equations, and Inequalities
5	Unit Rates, Proportionality, Scale, Percent
3	Triangles and Angle Relationships
3	Volume, Cross Sections, and the Pythagorean Theorem
2	Functions and Slope
2	Transformations
2	Measures of Central Tendency
2	Sampling
2	Probability

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 1:	Rational Number Operations		

UNIT SUMMARY

In this unit, students will fluently operate with all rational numbers. Students will use operations with positive and negative rationals to model situations and express real world problems and assess solutions. Students will understand that operating with number in the same form can help to solve problems in context.

NEW JERSEY STUDENT LEARNING STANDARDS

- 7.NS.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition/subtraction on a horizontal or vertical number line diagram.
- 7.NS.1.A: Describe situations in which opposite quantities combine to make 0.
- 7.NS.1.B: Understand $p+q$ as the number located a distance $|q|$ from p. In the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
- 7.NS.1.C: Understand subtraction of rational numbers as adding the additive inverse, $p-q=p+(-q)$. Show the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
- 7.NS.1.D: Apply properties of operations as strategies to add and subtract rational numbers.
- 7.NS.A.2: Apply and extend previous understandings of multiplication and division of fractions to multiply and divide rational numbers.
- 7.NS.A.2.A: Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1)(-1)=1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
- 7.NS.A.2.B: Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q)=(-p)/q=p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.
- 7.NS.A.2.C Apply properties of operations as strategies to multiply and divide rational numbers.
- 7.NS.A.2.D Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
- 7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

21st CENTURY LIFE AND CAREER READY PRACTICES

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

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

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 1.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
RI.9-10.8. Describe and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and reasoning.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.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.

	NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Students will understand that: ● How can we use rational number operations in the real world? ● Numbers can be represented in various forms and it can be useful to rewrite numbers and expressions to better understand a problem.	● How do you operate with all rational numbers? ● How can the properties of real numbers shed light on a problem?

UNIT LEARNING TARGETS (Students will know how to…)

- Fluently operate with integers and rational numbers
- Understand that positive and negative numbers can be used to represent real world contexts and situations
- Understand that all numbers have opposites and have a place on the number line
- Understand and represent the absolute values of all rational numbers
- Represent and problem solve with rational numbers.

LEARNING ACTIVITIES: (Students will be able to…)

- Model operations with rational number lines using number lines.
- Attend to precision when solving problems involving rational numbers in a real world context.
- Construct arguments that support the solutions to real world problems.
- Assess for the reasonableness of answers to problems in given context.

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
● Addition/Subtraction of Rationals ● Multiplication/Division of Rationals	District Summative Assessment: Pre-Algebra- Unit 1	● IXL ● Student Presentation ● Teacher Observation ● Problem Based

• Problem Solving with Rationals		Activities
INSTRUCTIONAL MATERIALS/RESOURCES		**TECHNOLOGY RESOURCES**
• Teacher created resources • LearnZillion • Illustrative Mathematics • Youtube • EngageNY		Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY
DIFFERENTIATION:		
Sparta Twp. Public Schools Differentiation Strategies		
TEACHER NOTES:		

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 2:	Roots and the Real Number System		

UNIT SUMMARY

Students will classify numbers as a subset of the real number system. They will use perfect square and cube root values to evaluate positive rational roots and solve real world root problems. Students will approximate irrational roots on a number line. Students will use properties of rational numbers to write numbers in both rational and decimal form.

NEW JERSEY STUDENT LEARNING STANDARDS

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

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

8.EE.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 is irrational.

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CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

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

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 2.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
RI.9-10.8. Describe and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and reasoning.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.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. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**

Students will understand that: ● Understand the derivation of the term square and cube root based on geometry models and how to use them to simplify expressions and solve equations. ● Understand that all decimal values which repeat eventually can be written as rational numbers (a ratio of two integers). The reverse is true. ● Identify irrational numbers in different forms and estimate rational approximations on a number line for these values. Students will understand why such approximations are practical.	● How are square and cube roots evaluated without a calculator? ● How can rational numbers be written in both decimal and fraction form? ● How can an irrational number be estimated with rational values?

UNIT LEARNING TARGETS (Students will know how to…)

- Learn common perfect squares and cubes in order to find square and cube roots of positive rational numbers.
- Create geometrical models for perfect square and cube values as well as their roots.
- Solve exponential equations involving perfect squares and cubes of positive rational numbers.
- Use square and cubed values in appropriate real world situations
- Utilize the long-division algorithm to rewrite fractions into decimal form and show that all rational numbers have a decimal expansion that repeats eventually.
- Rewrite rational numbers given in decimal form into a ratio of two integers (fraction form).
    - Describe the difference between rational and irrational numbers based on their decimal expansions and relate them in a Venn diagram.
    - Give rational estimates for irrational numbers on a number line without a calculator.
    - Compare and order expressions containing real numbers (both rational and irrational).

LEARNING ACTIVITIES: (Students will be able to…)

- Create geometric models for perfect cubes and squares and their roots.
- Use number lines as tools to show the approximation of imperfect squares.
- Look for patterns in the characteristics of the classifications of real numbers.
- Attend to the precision of the units when solving square and cube root application problems.

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
● The Real Number System ● Square and Cube Roots	● District Summative Assessment: Pre-Algebra- Unit 2	● IXL ● Student Presentation ● Teacher Observation ● Problem Based

• Estimating and Ordering Roots		Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:

Sparta Twp. Public Schools Differentiation Strategies

TEACHER NOTES:

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 3:	Unit 3 Exponents and Scientific Notation		

UNIT SUMMARY

Students will use properties of exponents to generate equivalent exponential expressions. Students will use properties of exponents and rational operations to understand and operate with values in scientific notation. Students will use scientific notation and exponents to solve problems.

NEW JERSEY STUDENT LEARNING STANDARDS

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

8.EE.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 x 10^8 and the population of the world as 7 x 10^9, and determine that the world population is more than 20 times larger.*

8.EE.4.1 Perform operations with numbers expressed in Scientific Notation, including problems where both decimal and scientific notation are used.

8.EE.4.2 Use Scientific Notation and choose units of appropriate size for measurements of very large and very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

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CRP11. Use technology to enhance productivity.

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TECHNOLOGY STANDARDS

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8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 3.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
RI.9-10.8. Describe and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and reasoning.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.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. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**

Students will understand that: ● Students will understand the derivation of exponential properties and use them appropriately to simplify expressions in order to identify equivalent expressions. ● Students will understand the connection between rules of exponents, decimal operations, and numbers written in scientific notation in order to translate between standard and scientific notation form of a number value. ● Students will be able to connect exponential rules and standard rational number operations to operations with numbers in scientific notation in order to solve problems using mathematical operations with numbers in different forms.	● How are the properties of integer exponents developed and applied? ● How can scientific notation be used to express very large and very small quantities? ● How can addition, subtraction, multiplication, and division be completed with numbers in scientific notation?

UNIT LEARNING TARGETS (Students will know how to…)

- Know and apply properties of integer exponents to generate equivalent numerical expressions using a single common base
- Classify expressions as to whether or not they are equivalent to given expressions using up to 3 rules of exponents in one task
- Convert between values written in standard decimal and scientific notation form using rules for writing numbers in scientific notation based on properties of exponents for powers of 10
- Tell how many times larger one scientific notation number is than another using division and exponent rules to compare them within the context of a real world scenario
- Compare numbers in which one value is scientific notation and the other standard decimal notation
- Recognize values produced by a calculator in scientific notation mode
- Respond to a written task using technology to type numbers with exponents and ratios properly with equation editor

LEARNING ACTIVITIES: (Students will be able to…)

- Use tables to model exponent laws
- Use scientific notation operations to determine the most precise solution to a problem.
- Look for patterns when computing exponents in standard notation to develop the laws of operating with exponents
- Students will make use of structure when solving problems using laws of exponents

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE

		ASSESSMENTS
• Laws of Exponents • Scientific Notation and Standard Form • SN Operations and Applications	District Summative Assessment- Pre Algebra 7 Unit 3	• IXL • Student Presentation • Teacher Observation • Problem Based Activities
INSTRUCTIONAL MATERIALS/RESOURCES		**TECHNOLOGY RESOURCES**
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY		Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY
DIFFERENTIATION:		
Sparta Twp. Public Schools Differentiation Strategies		
TEACHER NOTES:		

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 4:	Unit 4 Expressions(4a) Equations and Inequalities (4b)		

UNIT SUMMARY

In this unit students will use prior knowledge of algebraic expressions to write and simplify expressions. Students understand that algebraic expressions can rewritten to form equivalent expressions using properties of operations that can shed light on different contexts of problems.

Students will solve multi-step equations including variables on both sides and create equations from real world problems. They will understand that some equations will have different types of solutions, and look for patterns within the equations to determine these solutions.

Students will solve multi-step inequalities and represent the possible solutions to real world problems in context and on a number line. Students will understand the ways that inequalities differ than equations.

NEW JERSEY STUDENT LEARNING STANDARDS

7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

7.EE.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.

7.EE.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.

7.EE.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

8.EE.7

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).

21st CENTURY LIFE AND CAREER READY PRACTICES

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CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

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

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 4.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. RI.9-10.8. Describe and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and reasoning.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.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. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

	NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**
Students will understand that: ● Variables are symbols that represent numbers. ● Words can be translated into numerical expressions. ● Mathematical symbols can be used to represent different situations both numerically and algebraically. ● The same number can be added or subtracted from both sides of an equation and not change the equality. ● Multiplying or dividing both sides of an equation by the same nonzero number does not change the equality. ● Solving an equation involves finding the value of the unknown that makes the equation true. ● Multi-step equations can be manipulated to determine the number of solutions. ● There is more than one way to solve an equation. ● The order of operations must be considered when solving an equation or inequality. ● Multiplying or dividing both sides of an inequality by the same negative numbers changes the inequality. ● Solving an inequality involves finding the set of values that make the inequality true.	● How can we write expressions to represent real world situations? ● How can expressions be simplified using number operations? ● How can we represent situations from multi-step equations? ● How can equations be manipulated to determine the number of solutions? ● How can we graph the possible solutions to inequalities?
UNIT LEARNING TARGETS (Students will know how to…)	
● Simplify expressions using properties of numbers ● Create equivalent expressions to represent different contexts of situations ● Solve multi-step equations and understand that equations can have one, no, or infinitely many solutions ● Understand the similarities and differences in solving inequalities and equations and their solution sets. ● Represent the solution set of inequalities on a number line.	

LEARNING ACTIVITIES: (Students will be able to…)

- Students will make sense of the relationships between the terms of expressions and the real-world contexts they are used to represent.
- Students will reason abstractly and quantitatively by representing real-world and mathematical situations with algebraic expressions, equations and inequalities.
- Students will use algebraic expressions, equations and inequalities to model real-world and mathematical situations.
- Students will use verbal phrases to model algebraic expressions, equations and inequalities.
- Students will attend to precision when simplifying algebraic expressions and when solving equations and inequalities.
- Students will look for and make use of structure by using properties of operations to manipulate algebraic expressions into equivalent forms.
- Students will model solutions to inequalities on number lines
- Students will look for and express regularity in reasoning used to solve algebraic inequalities. For example, students will recognize that when the multiplication or division property of equality is used with a negative number, the inequality symbol changes.

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
• Parts of expressions • Simplifying and writing equivalent expressions • Solving and writing Multi-Step Equations • Solving, writing and graphing multi-step inequalities •	District Summative Assessment- Pre-Algebra 7: Unit 4a and Unit 4b	• IXL • Student Presentation • Teacher Observation • Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:

Sparta Twp. Public Schools Differentiation Strategies

TEACHER NOTES:

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 5:	Unit 5a- Unit Rates, Proportionality, Scale and 5b-Percents		

UNIT SUMMARY

In this unit students will extend prior knowledge of ratio and rates to determine the lower unit rates. They will use knowledge of fractions to compute unit rates as complex fractions. Students will understand that quantities that have the same unit rate are proportional and will earn to determine and represent proportionality from multiple measures. Students will be able to test for proportionality and extend this understanding to similar figures and scale. Students will be able to solve real world percent applications using the percent equation.

NEW JERSEY STUDENT LEARNING STANDARDS

7.RP.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.

7.RP.2 Recognize and represent proportional relationships between quantities.

7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

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CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

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

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 5.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. RI.9-10.8. Describe and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and reasoning.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.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. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Students will understand that: ● Proportional reasoning is essential in problem solving	● How do quantities change in relation to each other?

● Understanding mathematical relationships allows us to make predictions, calculate and model unknown quantities. ● Proportional relationships express how quantities change in relationship to each other. ● Scale factor is proportional and can be found in the real world.	● How do we use proportional relationships to solve real world problems? ● How is scale factor used in the real world?

UNIT LEARNING TARGETS (Students will know how to…)

- Compute unit rates associated with complex fractions
- Decide whether two quantities are in a proportional relationship
- Identify the constant of proportionality in tables, graphs and equations
- Solve problems involving scale drawings using proportional reasoning

LEARNING ACTIVITIES: (Students will be able to…)

- Students will reason abstractly and quantitatively by writing and solving proportions to represent real world situations.
- Students will look for and make use of structure to look for properties to set up and solve proportions
  Students will use tools strategically to model scale factor within scale drawings
- Students will attend to precision with units and measurements in scale drawings
- Students will model proportional relationships using equations, tables ,and graphs and scale factor using pictures.

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
● Unit Rate with Complex Fractions ● Proportions and proportionality ● Scale drawings/factor ● Basic percents ● Percent applications	District Summative Assessments: Pre-Algebra 7 Unit 5a **;** Pre-Algebra Unit 5b	● IXL ● Student Presentation ● Teacher Observation ● Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube

EngageNY	EngageNY District Task Resources
DIFFERENTIATION:	
Sparta Twp. Public Schools Differentiation Strategies	
TEACHER NOTES:	

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 6:	Unit 6: Triangles and Angle Relationships		

UNIT SUMMARY

In this unit students will investigate the limitations for triangle constructions and use appropriate tools to draw freehand triangles. Students will understand that all triangles have specific characteristics that either determine them to be possible or classified. Students will investigate the facts and characteristics of angle relationships including those of parallel lines. Students will informally argue the reasoning for these angle relationship facts. Justifying while using specific vocabulary.

NEW JERSEY STUDENT LEARNING STANDARDS

7.G.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

7.G.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

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

21st CENTURY LIFE AND CAREER READY PRACTICES

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

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

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 6.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. RI.9-10.8. Describe and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and reasoning.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.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. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**

Students will understand that:	
• Shapes exist in two dimensional form and are classified based on characteristics. • Specific conditions are needed to form triangles and triangles have specific characteristics. • We can use equations and angle characteristics to solve for missing values. • The angles formed from parallel lines and transversals form special relationships because of the slope of the lines.	• How do we represent points, lines and shapes in the coordinate plane? • What conditions are needed to form a triangle? • How do we describe triangles? • How can angle relationships be used to write equations? • How can we construct accurate drawings of triangles and angle relationships? • What can be observed and concluded about the angles formed by parallel lines that are cut by a transversal?

UNIT LEARNING TARGETS (Students will know how to…)

- Know how to name a point, line, ray, plane.
- Know basic geometric terms and symbols
- Identify types of triangles based on characteristics
- Explore conditions needed for triangles to exist
- Understand angle relationships and related vocabulary
- Explore the relationships formed from parallel lines and transversals and relate it to the slope of the lines involved.
- Use angle relationships to solve for missing values

LEARNING ACTIVITIES: (Students will be able to…)

- Students will construct viable arguments and critique the reasoning in regards to classifications of geometric terms, conditions of triangles and parallel line relationships.
- Use the appropriate tools to draw triangles other geometric shapes. Use equations, drawings, and manipulatives to create angle relationships and solve for missing values.
- Students will investigate the angles from parallel lines and justify their responses using specific vocabulary
- Students will use clear vocabulary and definitions when speaking about and describing geometry terms.
- Students will give precise answers appropriate to the problem context, for examples, assess their solutions to angle relationship equations as logical or illogical.

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS

• Triangle Inequality Theorem • Classifying Angle Relationships • Angles Formed from Parallel Lines • Angles and Algebra	Pre-Algebra 7: Unit 6	• IXL • Student Presentation • Teacher Observation • Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	**TECHNOLOGY RESOURCES**
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY District Task Resources

DIFFERENTIATION:
Sparta Twp. Public Schools Differentiation Strategies

TEACHER NOTES:

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 7:	Unit 7 Volume, Cross Sections & the Pythagorean Theorem		

UNIT SUMMARY

Students will first investigate the characteristics of three dimensional figures and the differences between 3D and 2D. They will then apply these characteristics to surface area, volume, and cross sections. In this unit students will also use prior knowledge of triangles and square roots to investigate the pythagorean theorem and its applications. Students will then extend their understanding or area and 2d figures, to three dimensional figures and volume. Students will apply volume formulas to real life scenarios including figures made up of multiple solids.

NEW JERSEY STUDENT LEARNING STANDARDS

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

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

8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

7.G.A.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

21st CENTURY LIFE AND CAREER READY PRACTICES

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

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

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 7.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. RI.9-10.8. Describe and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and reasoning.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.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. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**
Students will understand that: ● Students will understand the Pythagorean theorem for right triangles in terms of variables	● How can the Pythagorean theorem be used to solve problems, and what type of problems can it solve?

and words as well as use it to solve for missing side lengths on a right triangles for any problem in or out of real world context. ● Students will understand how to find the distance between two points in the coordinate plane by using the segment as the hypotenuse of a right triangle. ● Students will understand how to prove and explore the validity of the Pythagorean theorem using a geometric context. ● Students will understand how to prove and explore the validity of the Converse of the Pythagorean Theorem using a geometric context. ● Students will understand the formulas for volume of a cylinder, cone, and sphere and have a geometric understanding of why the volume of a cone is 1/3 of that of a cylinder with the same base area and height. ● Students will use the formulas for volume of a cylinder, cone, and sphere to solve problems in a real world context involving science and engineering. ● Three dimensional shapes can be sliced to form two dimensional shapes	● How can the Pythagorean theorem be justified? ● What is the converse of the Pythagorean Theorem and how can it be justified? ● What are the formulas for the volume of a sphere, cone, and cylinder and how can they be used to solve problems? ● How can we use the area of known shapes to calculate the surface area of three dimensional figures? ● How are three dimensional shapes different than two dimensional? ● How can we form two dimensional shapes from theoretically slicing three dimensional shapes?

UNIT LEARNING TARGETS (Students will know how to…)

- Use the Pythagorean theorem to solve for missing side lengths on a right triangle in or out of real world context. They should be able to give their answer as a whole number or as a decimal value to three decimal places using a calculator.
- Recognize a real world situation involving a right triangle where Pythagorean theorem can be used to solve the problem and solve it.
- Use the Pythagorean theorem to find the diagonal distance of a 3D rectangular prism (box) and recognize when a real world situation calls for this skill.
- Use the converse of the Pythagorean theorem to determine if three sides will form a right triangle.
- Find the volume of a cylinder, cone, or sphere given dimensions without context and without the formulas provided.

- Explain the relationship between the volume of a cylinder and a cone with the same base area and height.
- Recognize when real world situations call for the use of the volume formulas for 3D shapes and use them to solve problems.
- Solve multi-step complex problems involving sums or differences of 3D volume formulas.
- Identify specific ways a three dimensional figure can be sliced to result in a certain two dimensional figure

LEARNING ACTIVITIES: (Students will be able to…)

- Use models to represent volume in real life
- Use appropriate online tools to model volume
- Attend to precision when calculating side lengths of triangles
- Provide reasoning and justification to prove the pythagorean theorem

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
• Pythagorean theorem and applications • Volume of 3d Figures • Volume Applications • Cross Sections	• Pre-Algebra 7 Unit 7	• IXL • Student Presentation • Teacher Observation • Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:

Sparta Twp. Public Schools Differentiation Strategies

TEACHER NOTES:

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 8:	Unit 8 Functions and Slope		

UNIT SUMMARY

In this unit students will be introduced to function notation and properties of functions. Students will understand the definition of functions and relations and how they differ. Students will be able to represent and determine if values are a function from ordered, pairs, graphically, algebraically, and in tables. Students will be introduced to the concept of non-linear functions. Students will investigate the constant of proportionality in lines, and how this transfers to the slope of the line. Students will calculate slope from different methods. Students will learn how to create slope intercept form equations and convert between slope intercept and standard form. Students will understand that the rate of change can be represented as the slope and write equations from tables, graphs, and ordered pairs.

NEW JERSEY STUDENT LEARNING STANDARDS

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

8.EE.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.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.

21st CENTURY LIFE AND CAREER READY PRACTICES

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CRP2. Apply appropriate academic and technical skills.

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CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

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

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 8.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. RI.9-10.8. Describe and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and reasoning.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.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. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**

Students will understand that:	
● Students will understand that a function is a special type of relationship in which each input value created one output value of the equation which can be listed in a table and then graphed on a coordinate plane. ● Students will be able to translate between verbal descriptions, equations, tables, and graphs of simple functions. ● A line on a graph can be represented using a linear equation and can be written in different forms.	● What is a function equation? How can it be represented as a table or graph? ● How is a graph of a linear function created? ● What information can be found from slope intercept form? ● What does the slope of a line represent?

UNIT LEARNING TARGETS (Students will know how to…)

- Know the three views of a function and be able to discuss them with appropriate terminology including the words: input, output, slope, rate of change, graph, table, linear, non-linear, linear proportional, and relation.
- Be able to create an x-y-table and graphed based on a word scenario or equation of a function.
- Identify the input and output values of a function.
- Determine if a given view of a relation is a function.
- Understand that the slope of a line can be found in various ways
- Write the equations for lines in slope intercept form from points and graphs
- Understand the difference between zero and undefined slope, what they look like graphically and how to write them algebraically.
- Understand that slope can be calculated using similar triangles.

LEARNING ACTIVITIES: (Students will be able to…)

- Use online manipulatives to investigate functions as a machine
- Use online tools to explore different linear graphs, their slopes, and how their equations relate.
- Use repeated reasoning to determine the difference between functions and relations, and what values represent domain and range
- Model slope graphically and algebraically using appropriate tools both online and by hand.
- Look for structure in similar triangles to determine the slope of lines
- Look for repeated reasoning to determine the parts that make up slope intercept form and where they can be found from various forms.

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
• Functions Vs. Relations • Functions Basics • Slope in various forms	District Summative Assessment: Pre-Algebra: Unit 8	

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:
Sparta Twp. Public Schools Differentiation Strategies

TEACHER NOTES:

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 9:	Unit 9 Transformations		

UNIT SUMMARY

Students will explore mathematical functions that move objects in specific ways on the coordinate plane. These functional transformations include both congruence (translation, reflection, rotation) and similarity (dilation) transformations.

NEW JERSEY STUDENT LEARNING STANDARDS

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

A. Lines are taken to lines, and line segments to line segments of the same length.
B. Angles are taken to angles of the same measure.
C. Parallel lines are taken to parallel lines.

8.G.2

Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

8.G.3

Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

8.G.4

Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

21st CENTURY LIFE AND CAREER READY PRACTICES

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

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

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 9.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
RI.9-10.8. Describe and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and reasoning.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.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. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**

Students will understand that: ● Students will understand that coordinate techniques can be used to map a pre-image to an image under a transformation of reflection, rotation, translation, or dilation. ● Students will understand that translations, reflections, and rotations are congruence transformations, and that dilations are similarity transformations. ● Students will understand the properties of similar and congruent figures.	● How can coordinate techniques describe the result of a translation, rotation, or reflection? ● What properties of a figure are preserved under a translation, rotation, or reflection? ● What is the connection between transformations and figures that have the same size and shape? ● How can coordinate techniques describe the result of a dilation? ● What is the connection between transformations and similar figures?

UNIT LEARNING TARGETS (Students will know how to…)

- Be able to translate an image in the coordinate plane under a given vector mapping notation.
- Be able to reflect an image in the coordinate plane over a given axis mapping notation.
- Be able to rotate a figure in the coordinate plane under a given mapping notation of a positive angle which is 90, 180, or 270 degrees.
- Be able to dilate a figure in the coordinate plane under a given scalar mapping notation.
- Be able to describe the connections between congruent figures and transformations (isometries).
- Be able to describe the connections between similar figures and transformations.
- Describe properties of similarity and congruence that are preserved by certain transformations.
- Be able to identify if two figures will be congruent after a sequence of transformations in the coordinate plane.
- Be able to describe a sequence of transformations that will map one figure to another without a focus on coordinate geometry or providing a specified scale factor.

LEARNING ACTIVITIES: (Students will be able to…)

- Use online tools to look for patterns and regularity used to develop rules for transformations
- Reason abstractly to make predictions as to where given figures will be in the coordinate plane as a result of given transformations
- Create and justify arguments as to why certain transformations will make similar shapes and certain will result in congruent shapes.
- Use tools to explore the effects of dilations on a figure

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
● Translations and Reflections ● Rotations and Dilations	District Summative Assessment: Pre-Algebra 7: Unit 9	● IXL ● Student Presentation ● Teacher Observation

		• Problem Based Activities
INSTRUCTIONAL MATERIALS/RESOURCES		**TECHNOLOGY RESOURCES**
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY		Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY
DIFFERENTIATION:		
Sparta Twp. Public Schools Differentiation Strategies		
TEACHER NOTES:		

CONTENT AREA:	Math	**GRADE LEVEL**	7
UNIT 10:	Measures of Central Tendency Unit 10		

UNIT SUMMARY

Students will use measures of center and variability to make informal assessments about the degree of visual overlap of two numerical data distributions with similar variabilities. They will explore what measures of center would best be used to represent different data, and look into the differences between the measures of centers and variability and what it means for the data set.

NEW JERSEY STUDENT LEARNING STANDARDS

7.SP.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable*.

7.SP.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book*.

21st CENTURY LIFE AND CAREER READY PRACTICES

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CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

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

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 10.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
RI.9-10.8. Describe and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and reasoning.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.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. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
● Reading, understanding, interpreting and communicating data are critical in modeling a variety of real world situations, drawing	● How can the collection, organization, interpretation and display of data be used to solve problems?

appropriate inferences, making informed decisions and justifying those decisions. ● Observed differences of data can be used to make conjectures about multiple populations ● Data Distributions can be used to informally assess conjectures.	● What strategies can be used to compare two different data sets? ● How can measures of central tendency be used to help understand and describe data distribution? ● Is there anything surprising about data and their distribution?

UNIT LEARNING TARGETS (Students will know how to…)

- How to draw informal comparative inferences about two populations.
- How to investigate chance processes and develop, use and evaluate probability models.
- How to distinguish between likely and not likely events
- How to use lists or tree diagrams to identify possible outcomes and analyze probabilities.
- Find measures of central tendency and know which measure best represents data
- Use different models to represent and interpret data
- Find the variability or correlation of data sets
- Create and use frequency tables, line plots, box and whisker plots
- How to recognize, identify and describe the sources of variability when data are collected.
- How to determine which measure of center should be used to describe a distribution.
- How to use a variety of representations to display distributions
- How to develop and use strategies to compare data sets and distributions to solve real life problems

LEARNING ACTIVITIES: (Students will be able to…)

- Use models to visually assess data sets.
- Find measures of center while attending to precision of data points and distribution
- Use tools, online and by hand to display data in the best ways for that set.
- Students will attend to precision when calculating measures of center and variability.
- Students will look for and make use of structure in tables when calculating the mean absolute deviation.
- Students will look for and make use of structure in data displays when using them to find measures of center and spread for a data set.
- Construct arguments about conjectures made from displayed data distributions
- Students will model abstractly and quantitatively by relating statistical measures to make generalizations about a population.
- Students will construct arguments using measures of center and variability to describe generalized attributes of populations.
- Students will use appropriate tools strategically by creating visual displays to show specific measures or attributes of a population.

EVIDENCE OF LEARNING:		
FORMATIVE ASSESSMENTS	**SUMMATIVE ASSESSMENTS**	**ALTERNATIVE ASSESSMENTS**
• Measures of Center and Mean Absolute Deviation • Making inferences and comparing data sets • Representing data using measures of center and making informal observations	District Summative Assessment: Pre-Algebra- Unit 10	• IXL • Student Presentation • Teacher Observation • Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:

Sparta Twp. Public Schools Differentiation Strategies

TEACHER NOTES:

CONTENT AREA:	Math	**GRADE LEVEL:**	7
UNIT 11:	Sampling Unit 11		

UNIT SUMMARY

In this unit students will use prior knowledge of data collection and distributions to analyze populations and samples. Students will look at valid and invalid inferences based on specific types of sampling. Students will use data to make inferences about population samples and create displays that represent their data.

NEW JERSEY STUDENT LEARNING STANDARDS

7.SP.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

7.SP.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.

7.SP.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.

7.SP.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.

21st CENTURY LIFE AND CAREER READY PRACTICES

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CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

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

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 11.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. RI.9-10.8. Describe and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and reasoning.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.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. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**

Students will understand that:	
• Representative samples can be used to examine larger populations • Measures of center and variability of representative samples can be used to describe populations • Data collected from representative samples of populations can be used to make inferences about two populations	• How can we gain understanding about a large population by looking at a smaller portion? • What types of samples are representative of a population? • How can we use collected data to make predictions about similar samples? • How can measures of center and variability help us understand a sample population?

UNIT LEARNING TARGETS (Students will know how to…)

- Identify different types of population samples
- Use representative samples to represent populations
- Make predictions about a population from collected data from a sample
- USe data distributions and measures of variability to compare two populations

LEARNING ACTIVITIES: (Students will be able to…)

- Students will model abstractly and quantitatively by relating statistical measures to make generalizations about a population.
- Students will use appropriate tools like data displays to make inferences about populations
- Students will attend to precision when calculating measures of center and variability
- Students will look for structure and repeated reasoning in data drawn from population samples to make predictions and comparisons

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
• Types of Population Samples • Predictions from population Samples • Making inferences from data distributions to compare two populations	District Summative Assessment: Pre-Algebra: Unit 11	• IXL • Student Presentation • Teacher Observation • Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
LearnZillion Illustrative Mathematics Youtube EngageNY	**I**nteractive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics

	Youtube EngageNY
DIFFERENTIATION:	
Sparta Twp. Public Schools Differentiation Strategies	
TEACHER NOTES:	

CONTENT AREA:	Math	**GRADE LEVEL:**	7
UNIT 12:	Task 12: Probability		

UNIT SUMMARY

In this unit, students will learn about simple probability and determine whether an event is likely, unlikely, certain or impossible. Students will create probability models to study theoretical and experimental probability. Students will extend their understanding of simple probability to include compound probability and use different methods of organization, simulation and probability models represent events.

NEW JERSEY STUDENT LEARNING STANDARDS

7.SP.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

7.SP.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.

7.SP.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

7.SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

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CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

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

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

TECHNOLOGY STANDARDS

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8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 12.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. RI.9-10.8. Describe and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and reasoning.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.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. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**

Students will understand that:	
● Probability is a number between 0 and 1 (or 0% and 100%) that expresses the likelihood of an event occurring. ● The sum of the probabilities of the outcomes of an event must be 1. ● Larger probabilities indicate greater likelihood of occurrence. ● A probability near 0 indicates an unlikely event. ● Theoretical probability is the expected outcome of an event. ● Experimental probability is the actual outcome of an event. ● As the number of events increases, the experimental probability is likely to approach the theoretical probability. ● Compound probability is the chance of two or more events happening at once.	● How do we determine how likely an event is to occur? ● How does experimental probability support the concept of theoretical probability? ● How do the results from a probability model differ from the theoretical probability? ● How can we use models to determine the probability of compound events?

UNIT LEARNING TARGETS (Students will know how to…)

- Give formal and informal likelihoods of events using the continuum of probability.
- Confirm that all of the probabilities of the possible outcomes of an event add to 100%.
- Perform experiments to calculate experimental probability.
- Calculate theoretical probabilities.
- Use different models to represent compound probability.

LEARNING ACTIVITIES: (Students will be able to…)

- Students will make sense of problems by identifying events and possible outcomes of specific experiments.
- Students will use dice, spinners, cards, and other manipulatives to design and perform probability experiments.
- Students will look for and express regularity in repeated reasoning in probability experiments to derive the formula for theoretical probability.
- Students will use appropriate tools strategically by recognizing that probabilities can be represented by fractions, percents, and decimals and that each may shed light on the problem in a different way.
- Students will look for and make use of structure in the formula for the calculating theoretical probability of an event.
- Students will use appropriate tools to organize data for compound probability.

EVIDENCE OF LEARNING:

FORMATIVE ASSESSMENTS	SUMMATIVE ASSESSMENTS	ALTERNATIVE ASSESSMENTS
• Experimental Probability • Theoretical Probability • Compound Probability	District Summative Assessment: Pre-Algebra: Unit 12	• IXL • Student Presentation • Teacher Observation • Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Teacher created resources LearnZillion Illustrative Mathematics Youtube EngageNY	Interactive Whiteboard Classroom Laptop Set LearnZillion Illustrative Mathematics Youtube EngageNY

DIFFERENTIATION:
Sparta Twp. Public Schools Differentiation Strategies

TEACHER NOTES:

CONTENT AREA:	Math	**GRADE LEVEL:**	7
UNIT 13:	Task 13: Data Analysis and Representing Data		

UNIT SUMMARY

In this unit, students develop a more thorough and precise sense of exactly how functions, equations, and inequalities manifest themselves in the real world. They extend the concepts of slope (rate of change) and y-intercept (constant term) of linear models to formulate contexts surrounding and encompassing actual problem solving. The ability to apply and understand measures of central tendency, relative frequency, and other appropriate statistical measures serves to demonstrate structure, regularity, and perseverance throughout the Algebra 1 course.

NEW JERSEY STUDENT LEARNING STANDARDS

S.ID.1 Represent data with plots on the real number line.

S.ID.2 Use statistics appropriate to the shape of the data distribution to compare center and spread of two or more data sets

S.ID.3 Interpret differences in shape, center, and spread in the context of data sets, accounting for possible effects of extreme data points.

S.ID.6 Represent data on two quantitative variables on a scatter plot and describe how the variables are related

S.ID.7 Interpret the slope and intercept of a linear model in the context of the data.

S.ID.8 Compute (using technology) and interpret the correlation coefficient of a linear fit.

S.ID.9 Construct and interpret scatter plots

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TECHNOLOGY STANDARDS

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8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

CROSS CURRICULAR CONNECTIONS

Science: Students will make connections based on topics presented in unit 13.

READING ACROSS CONTENT AREAS	WRITING ACROSS CONTENT AREAS
RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. RI.9-10.8. Describe and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and reasoning.	NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. NJSLSA.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. NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**

Students will understand that:	
● Using probability can determine how many outcomes in given situations, and figure out the chances of an event occurring. ● Distribution of data shows the frequency of each possible data value. ● We use random variables to compute probability, and use probability distributions to solve real-world problems.	● In what different ways can data be represented on a real number line, and how can statistics appropriate to the shape of the data distribution serve to compare two or more data sets? ● How do relative frequencies, two-way frequency tables, and residual analysis help us summarize and better understand categorical data? ● What information can a slope (rate of change) and intercept (constant term) of a linear model provide regarding the context of a situation?

UNIT LEARNING TARGETS (Students will know how to…)

- Classify and analyze samples.
- Classify and analyze surveys.
- Identify biased and unbiased in samples and surveys
- Identify sample statistics and population parameters.
- Find and interpret the mean absolute deviation of a data set
- Find and interpret the standard deviation of a data set
- Use histograms to compare the distributions of two data sets
- Use box and whisker plots to compare the distributions of two data sets.
- Calculate experimental probability
- Find probabilities of independent/dependent events
- Find probabilities of mutually exclusive events.

LEARNING ACTIVITIES: (Students will be able to…)

- Students will make sense of problems and persevere in solving them.
- Students will reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others
- Students will model with mathematics.
- Students will use appropriate tools strategically.
- Students will attend to precision.
- Students will look for and make use of structure.
- Students will look for and express regularity in repeated reasoning.
- Mathematically proficient students are able to compare the effectiveness of two plausible arguments.
- Mathematically proficient students recognize both the insight to be gained and the limitations of mathematical tools. Discuss the pros and cons of creating statistical graphs with graphing calculators. Allow students to work together with these tools.
- Mathematically proficient students use previously established results in constructing arguments. Have students use what they have learned about distributions to discuss how to analyze a bimodal distribution.

- Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life. Point out that it may not seem so, but a random password like 12345 is as likely as 92152.

EVIDENCE OF LEARNING:		
FORMATIVE ASSESSMENTS	**SUMMATIVE ASSESSMENTS**	**ALTERNATIVE ASSESSMENTS**
• Scatter Plots, Histograms, Box Plots • Mean, Median • Standard Deviation	Summative Assessment on Stats	• IXL • Student Presentation • Teacher Observation • Problem Based Activities

INSTRUCTIONAL MATERIALS/RESOURCES	TECHNOLOGY RESOURCES
Algebra 1 Connected.mcgraw-hill.com	https://njctl.org/courses/math/algebra-ii/probability-and-statistics/attachments/probability-cw-and-hw/ https://njctl.org/courses/math/algebra-ii/probability-and-statistics/attachments/probability-cw-and-hw/ https://www.ixl.com/math/algebra-1/identify-biased-samples https://www.ixl.com/math/algebra-1/variance-and-standard-deviation https://www.ixl.com/math/algebra-1/mean-median-mode-and-range https://www.ixl.com/math/algebra-1/probability-of-independent-and-dependent-events

	https://www.ixl.com/math/algebra-1/theoretical-probability **https://www.ixl.com/math/algebra-1/experimental-probability**
DIFFERENTIATION:	
Sparta Twp. Public Schools Differentiation Strategies	
TEACHER NOTES:	