Curriculum Guide Cover Page

Course Title: Pre-Algebra
Grade Level: 8th Grade
Subject/Topic Area: Math
Written by: Jason Hansen
Revised Date: November 2013
Time Frame: One School Year (170 days)
School District: Hackensack
School: Hackensack Middle School

Brief Summary of Curriculum (including curricular context and goals):

Course Description:

- The course will provide a strong foundation of Pre-Algebra and Algebra I concepts, techniques, and applications to prepare students for more advanced work.
- Topics will be presented in a way that encourages students to become actively involved in the math curriculum.

Questions this course will investigate are:

- How is math used in real world situations?
- How is math used in everyday life?
- Why is algebra a fundamental course in mathematical learning?

Course Aim:

- The student will be able to complete written assignments, as determined by the teacher, to reinforce skills and concepts explained during class.
- The student will be able to understand the concept of rational numbers, ratios and percents, square roots, approximations, and multi-step computations of rational numbers.
- The student will be able to determine how change in linear dimensions affects perimeter, area and volume.
- The student will be able to understand the characteristics of circles, cylinders, cones and pyramids.
- The student will be able to use geometric properties to describe or identify the location of points on the coordinate plane.

- The student will be able to apply the Pythagorean Theorem to solve problems.
- The student will be able to calculate the area, perimeter, surface area and volume of two and three dimensional figures using geometrical properties including similarity.
- The student will be able to use the geometric properties of circles to calculate lengths and measures of angles.
- The student will be able to understand concepts of probability (i.e. compound, dependent, independent), identify possible sources of bias data collection, and draw reasonable lines to describe the data.
- The student will be able to understand the process of solving equations and inequalities with one variable and, where appropriate, represent solutions graphically.
- The student will be able to represent, order, and use numbers in a variety of equivalent forms.
- The student will be able to understand the concept and use of variables, mathematical vocabulary, and symbolic notation to represent and communicate ideas.
- The student will be able to use algebraic expressions to represent real-world situations.
- The student will be able to apply concepts to represent and analyze the relationship among a table of values, and algebraic formula, a written statement, and a graph, including the line and parabola.
- The student will be able to show understanding for operations on, and the general properties and behavior of functions.
- The student will be able to construct, interpret, and/or draw inferences from graphs, tables, and charts that reflect data from real-world situations.
- The student will be able to make informed financial decisions to interpret various costs and payments, use and interpret graphs to display information, and use formulas to understand, analyze, and model financial relationships.
- The student will be able to apply mathematics to various careers.
- The student will be able to use technology appropriately to make connections between numerical, algebraic, and graphical representations, generate spreadsheets and graphs (scatter plots, linear regression, quadratics, exponential growth/decay, etc…), and simulate real-life financial situations.
- The student will be able to communicate about and through mathematics, view mathematics as relevant to their lives and connected to other areas, understand the connections among the different strands of mathematics and the connections of mathematics to other content areas, and use quantitative and spatial information to make decisions.

Proficiencies:
Successful completion of the course will enable a student to:

- Add, subtract, multiply and divide real numbers.
- Determine the likelihood of an event using probability and odds.
- Write and evaluate expressions.
- Organize data and represent functions
- Learn techniques for solving linear equations systematically.
- Learn ways to apply ratios, rates, percent, and problem solving strategies.
- Graph linear equations.
- How to tell whether an equation or a graph represents a function.
- Learn three forms of linear equations.
- Write a linear equation given a slope and a point, or given two points.
- Write an equation of a line parallel or perpendicular to another line.
- Solve and graph inequalities.
- Use measures of central tendency and statistical plots.
- How to solve systems of linear equations.
- Multiply and divide expressions with exponents, and to use scientific notation in problems.
- Simplify radicals.
- Solve and graph quadratic equations.
- Add, subtract and multiply polynomials.
- Solve rational equations.
- Add, subtract, multiply and divide rational expressions.

1st SEMESTER

Pre-Algebra – Marking Period 1 – 32 days

- **Chapter 1 = 12 days**
  - Section 1-1: Variables and Expressions = 1 day
  - Section 1-2: Powers and Exponents = 1 day
  - Section 1-3: Order of Operations = 1 days
  - Section 1-4: Comparing and Ordering Integers = 1 day

    Quiz-Sections 1-1 through 1-4

  - Section 1-5: Adding Integers = 1 day
  - Section 1-6: Subtracting Integers = 1 day
  - Section 1-7: Multiplying and Dividing Integers = 2 days
  - Section 1-8: Coordinate Plane = 1 day

  Summative
    - 1 quiz, 1 review, 1 summative = 3 days

- **Chapter 2 = 11 days**
  - Section 2-2: Distributive Property = 2 days
  - Section 2-3: Distributing and Combining Like Terms = 2 days

    Quiz-Sections 2-2 and 2-3

  - Section 2-4: Variable and Equations Value = 1 day
  - Section 2-5: Solving One-Step Equations (Adding and Subtracting) = 1 day
  - Section 2-6: Solving One-Step Equations (Multiplying and Dividing) = 1 day
  - Section 2-7: Decimal Operations and equations with decimals = 1 day

  Summative
    - 1 quiz, 1 review, 1 summative = 3 days

- **Chapter 3 = 13 days**
    - Section 3-1: Solving two-step Equations = 2 days
    - Section 3-2: Solving equations with distribution and combining like terms = 2 days
    - Section 3-3: Solving equations with variable on both sides = 2 days

      Quiz-Sections 3-1 through 3-3

    - Section 3-4: Solving Inequalities using addition and subtraction = 1 day
    - Section 3-5: Solving Inequalities using multiplication and division = 1 day
    - Section 3-6: Solving multi-step inequalities = 2 days

    Summative
        - 1 quiz, 1 review, 1 summative = 3 days

Pre-Algebra – Marking Period 2 – 40 days

- **Chapter 4 = 13 days**
    - Section 4-1: Factors and Prime Factorization= 1 day
    - Section 4-2: Greatest Common Factor = 1 day
    - Section 4-3: Equivalent Fractions = 1 day
    - Section 4-4: Least Common Multiple = 1 day

      Quiz-Sections 4-1 through 4-4

    - Section 4-5: Rules of Exponents = 2 days
    - Section 4-6: Negative and Zero Exponents = 2 days
    - Section 4-7: Applications of Scientific Notation = 2 days

    Summative
        - 1 quiz, 1 review, 1 summative = 3 days

- **Chapter 6 = 13 days**
  - Section 6-1: Graphing Systems of Equations = 2 days
  - Section 6-2: Substitution = 2 days

    Quiz-Sections 6-1 and 6-2

  - Section 6-3: Elimination Using Addition and Subtraction = 1 day
  - Section 6-4: Elimination Using Multiplication = 2 days
  - Solve Systems all 3 ways activity = 1 day
  - Section 6-5: Applying Systems of Linear Equations = 2 days

  Summative
    - 1 quiz, 1 review, 1 summative = 3 days

- **Chapter 5 = 12 days**
  - Section 5-1: Rational Numbers = 1 day
  - Section 5-2: Adding Fractions= 1 day
  - Section 5-3: Subtracting Fractions = 1 day

    Quiz-Sections 5-1 through 5-3

  - Section 5-4: Multiplying Fractions = 2 days
  - Section 5-5: Dividing Fractions= 1 day
  - Section 5-6: Solving One-Step equations with rational numbers = 1 day
  - Section 5-7: Multi-Step equations with rational numbers = 2 days

  Summative
    - 1 quiz, 1 review, 1 summative = 3 days

- **Chapter 6 = 10 days**
    - Section 6-1: Ratios and Rates = 1 day
    - Section 6-2: Writing and Solving Proportions = 2 days
    - Section 6-3: Solving Proportions using cross products = 2 days

      Quiz-Sections 6-1 through 6-3

    - Section 6-4: Performing and Experiment Project = 2 days

      Summative
        - 1 quiz, 1 review, 1 summative = 3 days

- Midterm Review
- Midterm Exam

2nd SEMESTER

Pre-Algebra – Marking Period 3 – 33 days

- **Chapter 7 = 14 days**
    - Section 7-1: Percents and Fractions = 1 day
    - Section 7-2: Percents and Proportions = 1 day
    - Section 7-3: Percents and Decimals = 1 day
    - Section 7-4: Percent Equations = 1 day

      Quiz-Sections 7-1 through 7-4

    - Section 7-5: Percent Change = 2 days
    - Section 7-6: Percent Applications = 3 days
    - Section 7-7: Simple and compound interest = 1 day

      Summative
        - 2 quiz, 1 review, 1 summative = 4 days

- **Chapter 8 = 29 days**
    - Section 8-1: Relations and Functions = 1 day
    - Section 8-2: Linear Equations with two variables = 5 days
    - Section 8-3: Using Intercepts = 2 days

      Quiz-Sections 8-1 through 8-3

    - Section 8-4: The slope of a line = 2 days
    - Section 8-5: Slope-Intercept Form = 4 days
    - Section 8-6: Writing Linear equations = 3 days
    - Section 8-8: Solving systems using graphing and substitution = 5 days

      Quiz-Sections 8-4 through 8-8

    - Section 8-9: Graphs of Linear Inequalities = 3 days

        - 2 quizzes, 1 review, 1 summative = 4 days

Pre-Algebra – Marking Period 4 – 36 days

- **Chapter 9 = 17 days**
    - Section 9-1: Square Roots = 1 day
    - Section 9-2: Simplifying Square Roots = 3 days
    - Section 9-3: The Pythagorean Theorem = 3 days

      Quiz-Section 9-1 through 9-3

    - Section 9-5: The distance and midpoint formulas = 2 days
    - Section 9-6: Special Right Triangles = 2 days

    Summative
        - 1 quiz, 1 review, 1 summative = 3 days

- **NJASK 8 Review (Key Components-Chapter 10 and 11) = 6 days**

- **Chapter 12 = 10 days**
    - Section 12-1: Angle Relationships= 1 day
    - Section 12-2: Angles and parallel lines = 1 day
    - Section 12-3: Angle and polygons = 1 day

      Quiz-Section 12-1 through 12-3

    - Section 12-4: Translations = 1 day
    - Section 12-5: Reflections and symmetry = 1 day
    - Section 12-6: Rotations and symmetry = 1 day
    - Section 12-7: Dilations = 1 day

      Summative
        - 1 quiz, 1 review, 1 summative = 3 days

- End of the Year Assessment Review
- End of the Year Assessment

Assessment Calendar

• Sections 1.1-1.4 Quiz • Chapter 1 Test • Sections 2.2-2.3 Quiz • Chapter 2 Test • Sections 3.1-3.3 Quiz • Chapter 3 Test • Sections 4.1-4.4 Quiz • Chapter 4 Test • Sections 5.1-5.3 Quiz • Chapter 5 Test • Chapter 6 Test • Midterm Assessment	• Section 7.1-7.4 Quiz • Chapter 7 Test • Sections 8.1-8.3 Quiz • Sections 8.4-8.8 Quiz • Chapter 8 Test • Sections 9.1-9.3 Quiz • Chapter 9 Test • Chapters 10 and 11 Review Assessment • Sections 12.1-12.3 Quiz • Chapter 12 Test • End of the Year Assessment

DESIRED RESULTS			
Content Area:	Elements of Algebra	**Grade Level: 8th**	**Days:** 42
Domain:	Unit 1-Integers, Equations, and Inequalities		

Common Core State Standards

Standard ~ Established Goals

- 6.EE.1: Write and evaluate numerical expressions involving whole-number exponents.
- 6.EE.2: Write, read, and evaluate expressions in which letters stand for numbers.
- 6.EE.3: Apply the properties of operations to generate equivalent expressions.
- 6.NS.7: Understand ordering and absolute value of rational numbers.
- 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.
- 7.NS.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
- 7.NS.2: Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
- 8.EE.1: Know and apply the properties of integer exponents to generate equivalent numerical expressions.
- 8.EE.7: Solve linear equations in one variable.
- 8.SP.1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

Enduring Understandings	Essential Questions
Students will understand that: • An algebraic equation establishes the relationship between two things, containing a variable for which only one value will hold true. • One can manipulate equations keeping in mind that what occurs to one side of the equation must also happen on the other side of the equation.	• How can you tell whether a list of numbers has a pattern? • What needs to be true in order to modify an equation? • How can we manipulate an equation and keep its properties?

• They can manipulate standard equations and solve for "y" in order to determine the constant and the slope of the line to then be able to graph it.	
Knowledge: Students will know… ***(Acquisition)*** • Write and evaluate algebraic expressions • Perform operations with integers • Simplify expressions • Write and solve single and multi-step equations and inequalities	**Skills: Students will be able to do…** ***(Transfer: independently demonstrate)*** • Use the order of operations to simplify expressions. • Write and solve equations by using the four basic operations. • Solve equations by using multiple steps. • Use formulas to solve real world problems.

RESOURCES ***-Including culturally relevant materials aligned with the NJ Amistad Curriculum*** (www.NJAmistadCurriculum.com)	
Core materials	**Supplemental materials**
• Textbook	• Workbook/worksheets (publisher supplements) • ELMO • SmartBoard

DESIRED RESULTS			
Content Area:	Elements of Algebra	**Grade Level: 8th**	**Days:** 55
Domain:	Unit 2-Rational Numbers and Proportions		

Common Core State Standards

Standard ~ Established Goals

- 6.NS.2: Fluently divide multi-digit numbers using the standard algorithm.
- 6.NS.3: Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
- 6.NS.4: Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor.
- 6.RP.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
- 7.NS.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
- 7.NS.2: Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
- 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.
- 8.EE.1: Know and apply the properties of integer exponents to generate equivalent numerical expressions.
- 8.EE.4: Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
- 8.EE.7: Solve linear equations in one variable with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms, one solution, infinitely many solutions, or no solutions.
- 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.4: Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
- 8.NS.1: Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion;

for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	
Enduring Understandings	**Essential Questions**
Students will understand that: • Two numbers can be related to each other by their multiples and we can relate them through the lowest common multiples and the greatest common factors • Large and small numbers can be represented in shorter versions using scientific notation which represents a number in powers of ten • A proportion is the relationship of equivalent fractions • Prices may change given different everyday life circumstances such as discounts, taxes, stores' markups	• When is scientific notation an appropriate representation of numbers? • How is scientific notation related to standard form of a number? • What is the importance of finding the lowest common multiple and greatest common factor? • How can a proportion help you find an unknown quantity? • How can discounts, markups, and taxes affect the price of products and services? • How can similar figures keep their properties when made bigger/smaller?
Knowledge: Students will know… ***(Acquisition)*** • Find greatest common factor and least common multiple. • Identify equivalent fractions and write in simplest form. • Rules of exponents and scientific notation. • Covert between fraction, decimal, and percent form. • Operations with rational form numbers. • Write and compare rates and ratios. • Theoretical vs. experimental probability • Percent of change.	**Skills: Students will be able to do…** ***(Transfer: independently demonstrate)*** • Use proportions to solve word problems and find measures of missing sides of similar figures. • Solve proportion problems involving the conversion of fractions, decimals, and percents. • Write and solve proportion problems including taxes, markups, and discounts. • Solve word problems involving integer operations. • Find the Least Common Multiple or the Greatest Common Factor of two or more numbers. • Change numbers from standard form to scientific form and vice versa

RESOURCES ***-Including culturally relevant materials aligned with the NJ Amistad Curriculum*** **(**www.NJAmistadCurriculum.com)	
Core materials	**Supplemental materials**
• Textbook	• Workbook/worksheets (publisher supplements) • ELMO • SmartBoard

DESIRED RESULTS			
Content Area:	Elements of Algebra	**Grade Level: 8th**	**Days:** 55
Domain:	Unit 3-Functions, Geometry, and Measurement		

Common Core State Standards

Standard ~ Established Goals

- 7.G.4: Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
- 7.G.6: Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
- 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.
- 8.F.1: Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
- 8.F.2: Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
- 8.F.4: Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (*x, y*) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
- 8.F.5: Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
- 8.SP.1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
- 8.SP.2: Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
- 8.SP.3: Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.
- 8.SP.4: Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.

- 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 $\sqrt{2}$ is irrational.
- 8.EE.6: Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.
- 8.EE.8: Analyze and solve pairs of simultaneous linear equations.
- 8.G.6: Explain a proof of the Pythagorean Theorem and its converse.
- 8.G.7: Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
- 8.G.8: Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
- 8.G.9: Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
- A-REI.1: Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
- A-REI.3: Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Enduring Understandings	Essential Questions
Students will understand that: • Slope and rate of change can be found in equations, tables, and graphs • The slope of a line tells the change that one variable is experiencing compared to another. • A table can tell whether a function has a constant rate of change or not. Once this is defined they can develop an equation taking into consideration the start and the rate of change. • Systems of equations can be solved by graphing, substitution, or elimination methods. • Solutions to a linear inequality in two variables can be as the set of all points on one side of a boundary line.	• What does the slope tell us? • How can we develop a rule from a given table of values? • How can we find the intercepts of a linear equation? • How can we rewrite an equation in slope-intercept form? • Where do we use linear equations and inequalities in real life? • How can you use the graph of an equation to graph an inequality? • When is one representation of a literal equation more useful than another? • What must be true about a triangle to use the Pythagorean Theorem?

• Non-perfect squares can be simplified and have estimated square roots. • The Pythagorean Theorem will always be true for any right triangle. • Standard units of measure enable people to interpret results or data. • Geometry and spatial sense offer ways to interpret and reflect on our physical environment.	• How can area and volume formulas be used to solve real world problems? • Which area/volume formulas are related and why?
Knowledge: Students will know… ***(Acquisition)*** • Slope as ratio of rise : run and change in X : change in Y. • Writing equations from tables and graphs. • Solve systems of equations by graphing, substitution, and elimination. • Solve systems of inequalities by graphing. • Write systems of equations and inequalities to represent situations. • Evaluating and simplifying radicals. • Applications and uses of the Pythagorean Theorem. • Applications of geometric formulas.	**Skills: Students will be able to do…** ***(Transfer: independently demonstrate)*** • Relate slope of lines to the rate of change of two real-world quantities (i.e. speed, temperature change, etc.). • Investigate methods for solving systems of linear equations. • Classify systems based on their characteristics. • Investigate methods for solving systems of linear inequalities. • Write linear equations from tables and visual patterns. • Graph and explain solutions to linear equations, systems of equations, and linear inequalities. • Solve real-life problems using the Pythagorean Theorem including the usage of the coordinate plane. • Use of algebraic formulas to determine area, volume, and surface area.

RESOURCES ***-Including culturally relevant materials aligned with the NJ Amistad Curriculum*** (www.NJAmistadCurriculum.com)	
Core materials	**Supplemental materials**
• Textbook	• Workbook/worksheets (publisher supplements) • ELMO • SmartBoard

DESIRED RESULTS			
Content Area:	Elements of Algebra	**Grade Level: 8th**	**Days:** 15
Domain:	Unit 4-Data Analysis, Probability, and Transformations		

Common Core State Standards

Standard ~ Established Goals

- 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.8: Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
- 8.SP.1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
- 8.G.1: Verify experimentally the properties of rotations, reflections, and translations.
- 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.

Enduring Understandings	Essential Questions
Students will understand that: • Different measures can be used to interpret and compare sets of data. • When collecting data, it is important for the results to accurately represent the situation. • Data can be organized in matrices or in intervals.	• How can collecting and analyzing data help you make decisions or predictions? • How can you make and interpret different representations of data? • How is probability related to real world events? • How can you find the probability of more than one event?

• Counting methods can be used to find the number of possible ways to choose objects with and without regard to order. • Probabilities can be found by reasoning mathematically or by using experimental data. • Probabilities can be determined for multiple events. • Shapes will retain certain properties, like similarity/congruence, when transformations are applied.	• How would the image compare to the original figure after rotation, translation, reflection, and/or dilation? • What mathematical patterns result in these transformations?
Knowledge: Students will know… ***(Acquisition)*** • Information given in a variety of data displays. • Similarity and difference between permutation and combination. • Simple and compound probability. • Angle relationships. • Polygon angle sums. • Application of transformations.	**Skills: Students will be able to do…** ***(Transfer: independently demonstrate)*** • Read, analyze, and project outcomes of various data displays (graphs, tables, plots). • Find the number of possible outcomes when order is and is not important. • Determine the likelihood of dependent and independent events. • Use angle relationships and polygon angle sums to find missing angle measures of larger figures. • Mathematically rotate, reflect, translate, and dilate plane figures.

RESOURCES

-Including culturally relevant materials aligned with the NJ Amistad Curriculum (www.NJAmistadCurriculum.com)

Core materials	Supplemental materials
• Textbook	• Workbook/worksheets (publisher supplements) • ELMO • SmartBoard