DELAWARE VALLEY SCHOOL DISTRICT

PLANNED INSTRUCTION

A PLANNED COURSE FOR:

SAT Prep Math

_____

Grade Level 11

Date of Board Approval: _____2019_____

Planned Instruction

Title of Planned Instruction: SAT Prep Math

Subject Area: Mathematics   **Grade(s): 11**

Course Description:

This academic course provides a strong review for the four content areas on the math part of the College Board SAT: Heart of Algebra, Passport to Advanced Mathematics, Problem Solving with Data Analysis, and Additional Topics in Mathematics.

Time/Credit for the Course: 1/2 SEMESTER/ ¼ CREDIT; 45 days, meeting one period per day

Curriculum Writing Committee: Elizabeth Katz, Christine Marcial

SAT Prep Gradebook Policy				
Marking Period	**Quiz**	**Test**	**Homework**	**Total**
MP1	250		25	275
MP 2	250		25	275
Total Points	500		50	550
Total Percents	91%		9%	100%

Curriculum Map

1. Heart of Algebra   **Overview based on 10-12 days**

Goals:
- Define one or more variables that represent quantities.
- Write one or more equations, expressions, inequalities, or functions that represent the relationships described in a given question.
- Solve a linear equation or linear inequality, and interpret the solution in terms of what the question is asking.
- Understand and use the relationship between linear equations and inequalities and their graphs in order to solve problems.
- Analyze linear functions both graphically and algebraically.
- Solve a system of equations or inequalities.
- Evaluate and write expressions, inequalities, and equations using absolute value.

2. Problem Solving and Data Analysis   **Overview based on 10-12 days**

Goals:
- Utilize measures of central tendency and variability.
- Find and apply probabilities in context.
- Write relations and functions.
- Represent and analyze data distributions involving qualitative and quantitative data.
- Analyze standard deviation of a set of data.
- Create and analyze relationships using ratios, proportions, percentages and units.
- Interpret relationships presented in scatterplots, graphs, tables, and equations.

3. Passport to Advanced Mathematics   **Overview based on 10-12 days**

Goals:
- Understand function notation.
- Perform operations on polynomials (add, subtract, multiply, and divide).
- Factor polynomials including those with a GCF.
- Solve quadratic equations by factoring, graphing, completing the square, and/or quadratic formula.
- Simplify rational expressions.
- Solve rational equations.
- Evaluate composite functions.
- Simplify radical expressions.
- Solve equations involving radicals.
- Simplify exponents in expressions.

- Solve equations involving radicals and exponents.
- Create, analyze, and graph quadratic, exponential, and other non-linear functions.
- Identify transformations on graphs of linear, quadratic, and other non-linear functions.
- Analyze exponential functions and their graphs.
- Understand the relationships between algebraic and graphical representations of functions by finding the intercepts, domain, range, maximum and minimum values, intervals of increase and decrease, end behavior, asymptotes, symmetry, and transformations.
- Divide polynomials by a linear expression.

4. **Additional Topics in Mathematics**   **Overview based on 10-12 days**

   Goals:
- Use concepts and theorems about congruence and similarity to solve problems about lines, angles, and triangles.
- Solve problems using volume formulas.
- Use trigonometric ratios and the Pythagorean Theorem.
- Convert between degrees and radians and use radians to determine arc lengths
  - Use trigonometric functions of radian measure.
- Apply theorems about circles to find arc lengths, angle measures, chord lengths, and areas of sectors.
- Use the relationship between similarity, right triangles, and trigonometric ratios
  - Use the relationship between the sine and the cosine of complementary angles.
- Create or use an equation in two variables to solve a problem involving a circle in the coordinate plane.
- Add, subtract, multiply, divide, and simplify complex numbers.

Curriculum Plan

UNIT 1: Heart of Algebra

Standards: Pennsylvania Core State Standards for Mathematics

Standards Addressed:

CC.2,1.HS.D.1	CC.2.1.HS.F.4,	CC.2.2.HS.D.7,	CC.2.2.HS.D.9
CC.2.1.HS.F.2,	CC.2.2.HS.D.2,	CC.2.2.HS.D.8,	

Anchors Addressed: A1.2.1.1, A.1.1.2, A.1.1.3

Link to Standards in SAS:
http://static.pdesas.org/content/documents/PA%20Core%20Standards%20Mathematics%20PreK-12%20March%202014.pdf

Big Idea # 1:
Numbers, measures, expressions, equations, and inequalities can represent mathematical situations and structures in many equivalent forms.

Essential Questions:
- How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?

  Concepts:
- Functions and multiple representations

  Competencies:
- Use algebraic properties and processes in mathematical situations and apply them to solve real world problems.

Big Idea #2:
There are some mathematical relationships that are always true. These relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.

Essential Questions:
- How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?

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Concepts:
- Functions and multiple representations
- Algebraic properties and processes

Competencies:
- Use algebraic properties and processes in mathematical situations and apply them to solve real world problems.
- Write, solve, graph, and interpret linear equations and inequalities to model relationships between quantities.

Overview: Foundations for Algebra, Solving Equations & Inequalities

Goals:

Students will be able to write and solve equations or inequalities using their understanding of operations with and properties of real numbers. Students will apply these skills to solve real-world problems. Students will be able to solve systems of linear equations and inequalities. Students will be able to evaluate and write absolute values expressions and equations.

Objectives:
1. **Create, solve, or interpret a linear expression or equation in one variable** that represents a context. The expression or equation will have rational coefficients, and multiple steps may be required to simplify the expression, simplify the equation, or solve for the variable in the equation. (DOK – Level Two and Three)
2. **Create, solve, or interpret a linear inequality in one variable** that represents a context. The inequality will have rational coefficients, and multiple steps may be required to simplify or solve for the variable. (DOK – Level Two)
3. **Build a linear function that models a linear relationship between two quantities.** The student will describe a linear relationship that models a context using either an equation in two variables or function notation. The equation or function will have rational coefficients, and multiple steps may be required to build and simplify the equation or function. (DOK – Level Three)
4. **Create, solve, and interpret systems of linear inequalities in two variables.** The student will analyze one or more constraints that exist between two variables by creating, solving, or interpreting either an inequality in two variables or a system of inequalities in two variables to represent a context. Multiple steps may be required either to create the inequality or system of inequalities or to determine whether a given point is in the solution set. (DOK Level Two and Three)
5. **Create, solve, and interpret systems of two linear equations in two variables.** The student will analyze one or more constraints that exist between two variables by creating, solving, or analyzing a system of linear equations to represent a context. The equations will have rational coefficients, and multiple steps may be required to simplify or solve the system. (DOK Level Two and Three)
6. **Algebraically solve linear equations (or inequalities) in one variable.** The equation (or inequality) will have rational coefficients and may require multiple steps to solve for the

variable; the equation may yield no solution, one solution, or infinitely many solutions. The student may also be asked to determine the value of a constant or coefficient for an equation with no solution or with infinitely many solutions. (DOK Level Two and Three)

7. **Algebraically solve systems of two linear equations in two variables.** The equations will have rational coefficients, and the system yield no solution, one solution, or infinitely many solutions. The student may also be asked to determine the value of a constant or coefficient of an equation in which the system has no solution, one solution, or infinitely many solutions. (DOK Level Two)

8. **Interpret the variables and constants in expressions for linear functions within the context presented.** The student will make connections between a context and the linear equation that models the context. The students also will identify or describe the real-life meaning of a constant term, a variable, or a feature of the given equation. (DOK Level Four)

9. **Understand connections between algebraic and graphical representations.** The student will select a graph described by a given linear equation, select a linear equation that describes a given graph, determine the equation of a line given a verbal description of its graph, determine key features of the graph of a linear function from its equation, or determine how a graph may be affected by a change in its equation. (DOK Level Three and Four)

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Core Activities and Corresponding Instructional Methods:
1. Expose students' prior knowledge of the real number system, including operations with and properties of real numbers, as well as other pre-algebra skills (simplifying and/or evaluating algebraic expressions).
    a.   Diagnostic assessment, questioning
    b.   Cooperative learning groups
    c.   Direct instruction as needed using Smart Technology and online resources
    d.   Online resource materials (listed below)

2. Expose students' prior knowledge of irrational numbers as well as perfect squares and the inverse relationship between squaring and taking the square root. Introduce simplifying radicals involving products and quotients.
    a. Diagnostic assessment, questioning
    b. Cooperative learning groups
    c. Direct instruction as needed using Smart Technology and online resources
    d. Guided practice

3. Build math language/vocabulary.
    a. Teachers will use correct mathematical language to identify algebraic terms and processes.
    b. Writing activities incorporating appropriate math language

4. Develop students' skills in solving equations, inequalities (including absolute value), and compound inequalities.
    a. Direct instruction using Smart Technology and online resources.
    b. Guided practice
    c. Cooperative learning groups

5. Develop students' ability to solve problems by applying algebraic processes.
    a. Guided practice
    b. Cooperative learning groups

Extensions:
- Percent, Ratio, Proportion - Daily Warm-up
- SAT Practice Problems
- Enrichment Worksheets (Khan Academy Website and Kuta Software)

UNIT 2: Problem Solving and Data Analysis

Standards: Pennsylvania Core State Standards for Mathematics

Standards Addressed:

CC.2.2.HS.C.1,	CC.2.2.HS.D.7,	CC.2.4.HS.B.2,	CC.2.4.HS.B.7,
CC.2.2.HS.C.2,	CC.2.2.HS.D.9,	CC.2.4.HS.B.3,	CC.2.4.HS.F.3,
CC.2.2.HS.C.3,	CC.2.2.HS.D.10,	CC.2.4.HS.B.5,	CC.2.2.HS.F.4
CC.2.2.HS.C.6,	CC.2.4.HS.B.1,	CC.2.4.HS.B.6,	

Anchors Addressed: A.1.1.2.1 A.1,1.1.3, A1.2.1.1, A1.2.1.2, A1.2.2.1, A1.2.2.2, A1.2.3.1, A1.2.3.2, A1.2.3.3

Link to Standards in SAS:

http://static.pdesas.org/content/documents/PA%20Core%20Standards%20Mathematics%20PreK-12%20March%202014.pdf

Big Idea #1:
Bivariate data can be modeled with mathematical functions that approximate the data well and help us make predictions based on the data.

Essential Questions:
• How can we use univariate and bivariate data to analyze relationships and make predictions?

Concepts:
• Analysis of one and two variables (univariate and bivariate) data

Competencies:
• Display, analyze, and make predictions using univariate and bivariate data.

Big Idea #2:
Mathematical functions are relationships that assign each member of one set (domain) to a unique member of another set (range), and the relationship is recognizable across representations.

Essential Questions:
• How do you decide which functional representation to choose when modeling a real world situation, and how would you explain your solution to the problem?

Concepts:
• Functions and multiple representations

Competencies:
• Represent functions (linear) in multiple ways, including tables, algebraic rules, graphs, and contextual situations and make connections among these representations. Choose the

appropriate functional representation to model a real world situation and solve problems relating to that situation.

Big Idea #3:
Relations and functions are mathematical relationships that can be represented and analyzed using words, tables, graphs, and equations.

Essential Questions:
- How do you write, solve, graph, and interpret linear equations and inequalities to model relationships between quantities?
- How do you write, solve, graph, and interpret systems of two linear equations and inequalities using graphing and algebraic techniques?

Concepts:
- Linear relationships: Equation and inequalities in one and two variables
- Linear system of equations and inequalities

Competencies:
- Write, solve, graph, and interpret linear equations and inequalities to model relationships between quantities.
- Write, solve, graph, and interpret systems of two linear equations and inequalities using graphing and algebraic techniques.

Overview: Data Analysis and Probability and Linear Functions

Goals:
Students will be able to describe a data set using statistical measures and/or displays. Students will be able to calculate theoretical and experimental probabilities including compound events. Students will be able to represent and describe linear functions in order to model real world situations.

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Objectives:

1. **Use ratios, rates, proportional relationships, and scale drawings to solve single-step and multistep problems.** The students will use a proportional relationship between two variables to solve a multistep problem in order to determine a ratio or rate; calculate a ratio or rate and then solve a multistep problem; or take a given ratio or rate and solve a multistep problem. (DOK Level Two and Three)
2. **Solve single and multistep problems involving percentages.** The student will solve a multistep problem to determine a percentage; calculate a percentage and then solve a multistep problem; or take a given percentage and solve a multistep problem. (DOK Level One and Two)
3. **Solve single and multistep problems involving measurement quantities, units, and unit conversion.** The student will solve a multistep problem to determine a unit rate; calculate a unit rate and then solve a multistep problem; solve a multistep problem to complete a unit conversion; solve a multistep problem to calculate density; or use the concept of density to solve a multistep problem. (DOK Level Two)
4. **Given a scatterplot, use linear, quadratic, or exponential models to describe how the variables are related.** Given a scatterplot, the student will select the equation of a line or curve of best fit; interpret the line in the context of the situation; or use the line or curve of best fit to make a prediction. (DOK Level Three)
5. **Use the relationship between two variables to investigate key features of the graph.** The student will make connections between the graphical representation of a relationship and the properties of the graph by selecting the graph that represents the properties described, or by using the graph to identify a value or set of values. (DOK Level Three and Four)
6. **Compare linear growth with exponential growth.** The student will infer the connection between two variables given a context in order to determine what type of model fits best. (DOK Level Three)
7. **Use two-way tables to summarize categorical data and relative frequencies, and calculate conditional probability.** The student will summarize categorical data or use categorical data to calculate conditional frequencies, conditional probabilities, association of variables, or independence of events. (DOK Level Two and Three)
8. **Make inferences about population parameters based on sample data.** The student will estimate a population parameter given the results from a random sample of the population. The sample statistics may mention confidence intervals and measurement error of which the student should understand and make use, but need not calculate. (DOK Level Two and Three)
9. **Use statistics to investigate measures of center of data and analyze shape, center, and spread.** The student will calculate measures of central tendency and/or spread for a given set of data or use given statistics to compare two separate sets of data. The measures of central tendency that may be calculated include mean, median, and mode; the measures of spread that may be calculated include range. When comparing two data sets, the student may investigate mean, median, mode, range, and/or standard deviation. (DOK Level Two and Three)
10. **Evaluate reports to make inferences, justify conclusions, and determine appropriateness of data collection methods.** The reports may consist of tables, graphs, or text summaries. (DOK Level Four)

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Core Activities and Corresponding Instructional Methods:
1. Expose students' prior knowledge of frequency tables, histograms, and measures of central tendency (mean, median and mode) as well as the range of a data set.
   a. Diagnostic assessment, questioning
   b. Cooperative learning groups
   c. Direct instruction as needed using Smart Technology and online resources
   d. Guided practice
2. Build math language/vocabulary.
   a. Teachers will use appropriate language to discuss data displays and measures of central tendency and variability.
   b. Writing activities incorporating appropriate math language

3. Develop students' skills in creating and interpreting box-and-whisker plots.
   a. Direct instruction using Smart Technology and online textbook resources.
   b. Guided practice
   c. Cooperative learning groups

4. Develop students' ability to determine theoretical and experimental probabilities, including mutually exclusive and overlapping events as well as independent and dependent events.
   a. Direct instruction using Smart Technology, manipulatives such as dice, cards or marbles, and online resources.
   b. Guided practice
   c. Cooperative learning groups

5. Expose students' prior knowledge of the coordinate plane and plotting points. Review graphing a line using a table of values. Identify and represent patterns that form a line.
   a. Diagnostic assessment, questioning
   b. Cooperative learning groups
   c. Direct instruction as needed using Smart Technology and online resources
   d. Guided practice

Extensions:
- Organizing Data using Keystone resources
- Samples and Surveys
- Direct Variation
- Enrichment Worksheets (Khan Academy and Kuta Software)
- Permutations and Combinations
- SAT Practice Problems

UNIT 3: Passport to Advanced Mathematics

Standards: Pennsylvania Core State Standards for Mathematics

Standards Addressed:

CC.2.1.HS.F.1,	CC.2.1.HS.F.3,	CC.2.1.HS.F.5,	CC.2.2.HS.D.2,
CC.2.1.HS.F.2,	CC.2.1.HS.F.4,	CC.2.2.HS.D.1,	CC.2.2.HS.D.3

Anchors Addressed: A1.1.1.5, A1.1.2.2, A1.1.3.1, A1.1.3.2

Link to Standards in SAS:

http://static.pdesas.org/content/documents/PA%20Core%20Standards%20Mathematics%20PreK-12%20March%202014.pdf

Big Idea #1:
There are some mathematical relationships that are always true. These relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.

Essential Questions:
- How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?

Concepts:
- Algebraic properties and processes

Competencies:
- Use algebraic properties and processes in mathematical situations and apply them to solve real world problems.

Big Idea #2:
Relations and functions are mathematical relationships that can be represented and analyzed using words, tables, graphs, and equations.

Essential Questions:
- How do you decide which functional representation to choose when modeling a real world situation, and how would you explain your solution to the problem?

Concepts:
- Functions and multiple representations

Competencies:
- Use algebraic properties and processes in mathematical situations and apply them to solve real world problems.

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Overview: Quadratic and Exponential Functions, Exponents, Polynomials, Rational
Functions

Goals:
Students will use their knowledge of quadratic and exponential functions to solve equations
algebraically and graphically. Students will be able to apply properties of exponents as they
multiply and factor polynomials. Students will be able to solve quadratic equations by
factoring. Students will be able evaluate rational equations and expressions.

Objectives:
1. **Create a quadratic or exponential function** or equation that models a context. The equation
   will have rational coefficients and may require multiple steps to simplify or solve the equation.
   (DOK Level Two)
2. **Determine the most suitable form of an expression** or equation to reveal a particular trait,
   given a context. (DOK Level Three)
3. **Create equivalent expressions involving rational exponents** and radicals, including
   simplifying or rewriting in other forms. (DOK Level One and Two)
4. **Create an equivalent form of an algebraic expression** by using structure and fluency with
   operations. (DOK Level One and Two)
5. **Solve a quadratic equation** having rational coefficients. The equation can be presented in a
   wide range of forms to require attending to algebraic structure and can require manipulation in
   order to solve. (DOK Level Two)
6. **Add, subtract, and multiply polynomial expressions** and simplify the result. The expressions
   will have rational coefficients. (DOK Level Two)
7. **Solve an equation in one variable that contains radicals or contains the variable in the
   denominator of a fraction.** The equation will have rational coefficients, and the student may
   be required to identify when a resulting solution is extraneous. (DOK Level Two and Three)
8. **Solve a system of one linear equation and one quadratic equation.** The equations will have
   rational coefficients. (DOK Level Two)
9. **Rewrite simple rational expressions.** Students will add, subtract, multiply, or divide two
   rational expressions or divide two polynomial expressions and simplify the result. The
   expressions will have rational coefficients. (DOK Level Two)
10. **Interpret parts of nonlinear expressions in terms of their context.** Students will make
    connections between a context and the nonlinear equation that models the context to identify or
    describe the real-life meaning of a constant term, a variable, or a feature of the given equation.
    (DOK Level Four)
11. **Understand the relationship between zeros and factors of polynomials**, and use that
    knowledge to sketch graphs. Students will use properties of factorable polynomials to solve
    conceptual problems relating to zeros, such as determining whether an expression is a factor of
    a polynomial based on other information provided. (DOK Level Three)
12. **Understand a nonlinear relationship between two variables** by making connections
    between their algebraic and graphical representations. The student will select a graph
    corresponding to a given nonlinear equation; interpret graphs in the context of solving systems
    of equations; select a nonlinear equation corresponding to a given graph; determine the
    equation of a curve given a verbal description of a graph; determine key features of the graph

of a linear function from its equation; or determine the impact on a graph of a change in the defining equation. (DOK Level Four)

13. **Use function notation and interpret statements using function notation.** The student will use function notation to solve conceptual problems related to transformations and compositions of functions. (DOK Level Two)

14. **Use structure to isolate or identify a quantity of interest** in an expression or isolate a quantity of interest in an equation. The student will rearrange an equation or formula to isolate a single variable or a quantity of interest. (DOK Level Three and Four)

Core Activities and Corresponding Instructional Methods:

1. Develop students' skills in solving quadratic and exponential equations both graphically and algebraically.
   a. Direct instruction using Smart Technology and online resources.
   b. Guided practice
   c. Cooperative learning groups

2. Develop students' ability to solve real world problems by applying their understanding of functions, equations, and inequalities.
   a. Guided practice
   b. Cooperative learning groups

3. Expose students' prior knowledge of exponents. Guide students to develop the properties of exponents using the definition of an exponent.
   a. Diagnostic assessment, questioning
   b. Cooperative learning groups
   c. Direct instruction as needed using Smart Technology and online resources
   d. Guided practice

4. Build math language/vocabulary, specifically *monomial, binomial, trinomial,* and *polynomial.*
   a. Teachers will use appropriate language to identify algebraic terms.
   b. Writing activities incorporating appropriate math language

5. Develop students' skills in adding and subtracting polynomials followed by multiplying polynomials (two binomials or a binomial by a trinomial).
   a. Direct instruction using Smart Technology and online textbook and resources.
   b. Guided practice
   c. Cooperative learning groups

Extensions:
- SAT Practice Problems
- Enrichment Worksheets - emphasizing word problems (Khan Academy and Kuta Software)

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UNIT 4:   Additional Topics

Standards: Pennsylvania Core State Standards for Mathematics

Standards Addressed:

CC.2.1.HS.F.1,	CC.2.2.HS.D3,	CC.2.3.HS.A.3,	CC.2.3.HS.A.12,
CC.2.1.HS.F.2,	CC.2.2.HS.D4,	CC.2.3.HS.A.7,	CC.2.3.HS.A.14
CC.2.2.HS.D1,	CC.2.2.HS.D5,	CC.2.3.HS.A.8,	
CC.2.2.HS.D2,	CC.2.2.HS.D.6,	CC.2.3.HS.A.9,	

Anchors Addressed: A.1.1.1.5, A.1.1.1.3

Link to Standards in SAS:

http://static.pdesas.org/content/documents/PA%20Core%20Standards%20Mathematics%20PreK-12%20March%202014.pdf

Big Idea # 1:
Numbers, measures, expressions, equations, and inequalities can represent mathematical situations and structures in many equivalent forms.

Essential Questions:
- How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?

Concepts:
- Multiple geometric representations

Competencies:
- Use mathematical properties and processes in situations and apply them to solve real world problems.

Big Idea #2:
There are some mathematical relationships that are always true. These relationships are used as the rules of Geometry and Algebra and are useful for writing equivalent forms.

Essential Questions:
- How can we show that geometric properties and processes are extensions of arithmetic properties and processes, and how can we use geometric properties and processes to solve problems?

Concepts:
- Multiple representations
- Geometric properties and processes

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Competencies:
- Use algebraic and geometric properties and processes in mathematical situations and apply them to solve real world problems.

Overview: Additional Topics

Goals:

Students will be able to apply properties of Geometry to solve problems involving volume, Trigonometry, Pythagorean Theorem, circles, congruence, and similarity. Students will perform operations on complex numbers.

Objectives:
1. **Solve problems using volume formulas.** The student will use given information about figures - such as length of a side, area of a face, or volume of a solid - to calculate missing information. Any required volume formulas will be provided to students either on the formula sheet or within the question. (DOK Level One and Two)
2. **Use Trigonometric ratios and the Pythagorean Theorem** to solve applied problems involving right triangles. The student will use information about triangle side lengths or angles presented in a context to calculate missing information using the Pythagorean Theorem and/or Trigonometric ratios. (DOK Level Two)
3. **Add, subtract, multiply, divide, and simplify complex numbers**. (DOK Level One and Two)
4. **Convert between degrees and radians and use radians to determine arc lengths; use Trigonometric functions of radian measure.** The student will convert between angle measures in degrees and radians in order to calculate arc lengths by recognizing the relationship between an angle measured in radians and an arc length, evaluating trigonometric functions of angles in radians. (DOK Level Two)
5. **Apply theorems about circles to find arc lengths, angle measures, chord lengths, and areas of sectors.** The student will use given information about circles and lines to calculate missing values for radius, diameter, chord length, angle, arc, and sector area. (DOK Level Three)
6. **Use concepts and theorems about congruence and similarity to solve problems about lines, angles, and triangles.** The student will use theorems about triangles and intersecting lines to determine missing lengths and angle measures of triangles. The student may also be asked to provide a missing length or angle to satisfy a given theorem. (DOK Level Three)
7. **Use the relationship between similarity, right triangles, and trigonometric ratios; use the relationship between sine and cosine of complementary angles.** The student will use Trigonometry and theorems about triangles and intersecting lines to determine missing lengths and angle measures of right triangles. The student may also be asked to provide a missing length or angle that would satisfy a given theorem. (DOK Level Two)
8. **Create or use an equation in two variables to solve a problem about a circle in the coordinate plane.** The student will create an equation or use properties of an equation of a circle to demonstrate or determine a property of the circle's graph. (DOK Level Two and Three)

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Core Activities and Corresponding Instructional Methods:
1. Develop students' ability to solve problems using formulas, such as volume, area and perimeter.
   a. Direct instruction using Smart Technology and online resources.
   b. Guided practice
   c. Cooperative learning groups

2. Develop students' ability to solve applications by using Trigonometric ratios
   a. Direct instruction using Smart Technology and online resources.
   b. Guided practice
   c. Cooperative learning groups

3. Develop students' skills in adding, subtracting, multiplying and dividing complex numbers
   a. Direct instruction using Smart Technology and online resources.
   b. Guided practice
   c. Cooperative learning groups

4. Build math language/vocabulary.
   a. Teachers will use appropriate language to identify Algebraic terms and processes.
   b. Writing activities incorporating appropriate math language

5. Develop students' ability to solve equations involving right triangles and trigonometric ratios
   a. Direct instruction using Smart Technology and online resources.
   b. Guided practice
   c. Cooperative learning groups

6. Expose students' prior knowledge of circles to solve arc length and area problems.
   a. Diagnostic assessment, questioning
   b. Cooperative learning groups
   c. Direct instruction as needed using Smart Technology and online resources
   d. Guided practice

Extensions:
- Enrichment Worksheets (Khan Academy and Kuta Software)

Assessments:

Diagnostic:
Teacher prepared pre-test/diagnostic test
Teacher questioning and observation
Benchmark Assessment – through Khan Academy

Formative:
Teacher observations, questions, discussions
Homework
Teacher prepared assessments (quizzes and chapter tests)
Khan Academy Benchmarks

Summative:
CollegeBoard SAT exam

Correctives:
Reteaching and practice worksheets available through Khan Academy and Collegeboard
Practice worksheets generated through Kuta Software
Online Resources listed below

Materials and Resources:
Online Resources: Khan Academy, Collegeboard, Kaplan
Teacher Generated Worksheets (Kuta Software)
Kaplan Math Workbook for the New SAT copy write 2015
Collegeboard The Official SAT Study Guide copy write 2015

Online resources:
https://collegeboard
https://KhanAcademy
https://quizizz.com/admin
https://edpuzzle.com/
www.curriculumpathways.com/portal/mobile/algebra1/start.html
https://braingenie.ck12.org
https://www.usatestprep.com/home

Primary Textbook(s) Used for this Course of Instruction:

There is no primary textbook for this course.

Practice is structured through College Board and Khan Academy websites.

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Checklist to Complete and Submit with Curriculum:

_____ A hard copy of the curriculum using The template entitled "Planned Instruction," available on the district website

_____ Hard copies of all supplemental resources not available electronically

_____ The primary textbook form(s)

**_____ The appropriate payment form, in compliance with the maximum curriculum writing
    hours noted on the first page of this document**

**_____ A USB/Flash Drive containing a single file that will print the curriculum in its
    intended sequence from beginning to end and all supplemental resources that are
    available in electronic format.**

Each principal and/or department chair has a schedule of First and Second Readers/Reviewers. Each Reader/Reviewer must sign & date below.

First Reader/Reviewer Printed Name_____

First Reader/Reviewer Signature_____ Date_____

Second Reader/Reviewer Printed Name_____

Second Reader/Reviewer Signature _____ Date_____