DELAWARE VALLEY SCHOOL DISTRICT

PLANNED INSTRUCTION

A PLANNED COURSE FOR:

Math 8

Grade Level: 8

Date of Board Approval: _____2017_____

DELAWARE VALLEY SCHOOL DISTRICT

Planned Instruction

Title of Planned Instruction: Math 8

Subject Area: Mathematics Grade(s): 8

Course Description: This course is designed for students who are proficient in arithmetic skills, but are not ready for Algebra 1. Only the first half of the Algebra 1 Curriculum is covered. This will allow more time to develop both conceptual and procedural understanding of topics for successful completion of Algebra 1 and the PSSA's. The topics covered include properties of real numbers, solving equations and inequalities, graphing and writing linear equations, graphing linear inequalities, geometry, probability, and solving systems of equations and inequalities.

Time/Credit for the Course: 2 SEMESTERS, 1 CREDIT, 180 days, meeting 1 period per day

Curriculum Writing Committee: James Salus, Jessica Swanick

Gradebook Policy for Math 8

Marking Period	**Assessments (95%) Quiz (50 points)**	**Test (100)**	**Homework/ Participation (5%)**	
MP 1	3-5 quizzes	1-2 Tests	Homework grade represents completion of assignments given throughout the quarter.	Participation grade represents a daily grade.
MP 2	3-5 quizzes	1-2 Tests		
MP 3	3-5 quizzes	1-2 Tests		
MP 4	3-5 quizzes	1-2 Tests		

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Curriculum Map

1. **Marking Period One: Foundations for Algebra, Real Numbers**
   Goals understanding of:
   - Properties and Operations with real numbers
   - Powers and Exponents
   - Scientific Notation and Operations with Scientific Notation
   - Roots and Radicals

2. **Marking Period Two: Solving Equations, Equations in Two Variables, Scatter Plots**
   Goals understanding of:
   - Solving Equations
   - Rate of Change and Slope and Slope Intercept Form
   - Writing Linear Equations
   - Solving Systems of Linear Equations by Graphing and Elimination
   - Relations, Linear and Non-Linear Functions
   - Qualitative Graphs

3. **Marking Period Three: Geometry, Data Analysis**
   Goals understanding of:
   - Pythagorean Theorem
   - Distance on the Coordinate Plane
   - Transformations: Translations, Reflections, Rotations, Dilations
   - Congruence and Similarity with Transformations
   - Volume of Cylinders, Cones, Spheres
   - Change in Dimensions
   - Two-Way Tables
   - Descriptive Statistics

4. **Marking Period Four: Systems of Equations/Inequalities, Linear Inequalities, Probability**
   Goals understanding of:
   - Systems of linear equations (substitution) and inequalities
   - Compound Inequalities
   - Graphing Linear Inequalities
   - Graphing Systems of Linear Inequalities
   - Probability

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Curriculum Plan

UNIT 1:

Big Idea # 1:

- The Number System: Know that there are numbers that are not rational, and approximate them by rational numbers.

Big Idea #2:

- Expressions: Work with radicals and integers exponents.

Mathematical Standard Areas:
Standard(s): Pennsylvania Core State Standards for Mathematics

Standards Addressed: CC.2.1.8.E.1, CC.2.1.8.E.4, CC.2.2.8.B.1

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

Overview: Foundations for Algebra, Real Numbers

Goals:
Students will be able to evaluate expressions with real numbers by applying the order of operations which includes grouping symbols and exponents.
Students will be able to solve expressions involving radicals and integer exponents.
Students will apply these skills to solve real-world problems.

Objectives:

1. Students will be able to write fractions as decimals and decimals as fractions. (DOK – Level One)
2. Students will be able to evaluate expressions by applying the order of operations which includes grouping symbols and exponents. (DOK – Level Two)
3. Students will be able to simplify real number expressions by multiplying and dividing monomials. (DOK – Level Two)
4. Students will be able to identify and apply properties of real numbers. (DOK – Level Three)
5. Students will be able to use the laws of exponents to find powers of monomials. (DOK – Level Two)
6. Students will be able to simplify expressions involving negative exponents. (DOK – Level Two)
7. Students will be able to use scientific notation to write large and small numbers. (DOK

– Level Two)

8. Students will be able to compute with numbers written in scientific notation (DOK – Level Two)
9. Students will be able to interpret scientific notation when using technology. (DOK – Level Three)
10. Students will be able to find and estimate square roots and cube roots. (DOK – Level Two)
11. Students will be able to compare mathematical expressions. (DOK – Level One)
12. Students will be able to apply the Pythagorean Theorem and its converse to show a triangle is a right triangle. (DOK – Level Two)
13. Students will be able to apply mathematics to problems arising in the workplace. (DOK – Level Three)

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Curriculum Plan

UNIT 2:

Big Idea #1:

- Expressions and Equations: Analyze and solve linear equations and pairs of simultaneous linear equations, understand the connections between proportional relationships, linear and linear equations.

Big Idea #2:

- Functions: Define, evaluate, and compare functions, use functions to model relationships between quantities.

Mathematical Standard Areas:
Standard(s): Pennsylvania Core State Standards for Mathematics

Standards Addressed: CC.2.1.8.E.1, CC.2.1.8.E.4, CC.2.2.8.B.2, CC.2.2.8.B.3, CC.2.2.8.C.1, CC.2.2.8.C.2

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

Overview: Solving Equations, Equations in Two Variables, Scatter Plots

Goals:
Students will be able to write and solve equations and systems of equations by using their understanding of operations with and properties of real numbers.
Students will apply these skills to solve real-world problems.
Students will be find slope, graph and write linear equations.

Objectives:

1. Students will be able to solve equations with rational coefficients. (DOK – Level One)
2. Students will be able to solve two step equations. (DOK – Level One)
3. Students will be able to write two step equations that represent situations. (DOK – Level Two)
4. Students will be able to solve equations with variables on each side. (DOK – Level Two)
5. Students will be able to solve multi step equations. (DOK – Level Three)
6. Students will be able to identify proportional and nonproportional relationships by finding a constant rate of change. (DOK – Level Three)
7. Students will be able to use tables and graphs to find the slope of a line. (DOK – Level Three)

8. Students will be able to graph linear equations using the slope and y-intercept. (DOK – Level Three)
9. Students will be able to write an equation of a line. (DOK – Level Four)
10. Students will be able to solve systems of linear equations by graphing. (DOK – Level Two)
11. Students will be able to solve systems of linear equations algebraically. (DOK – Level Three)
12. Students will be able to construct and make conjectures about scatter plots. (DOK – Level Two)
13. Students will be able to use data models to make predictions. (DOK – Level Three)
14. Students will be able to draw lines of best fit and use them to make predictions about data. (DOK – Level Four)
15. Students will be able to apply mathematics to problems arising in the workplace. (DOK – Level Three)
16. Students will be able to sketch and describe qualitative graphs. (DOK – Level Two)
17. Students will be able to represent relations and linear functions using tables and graphs. (DOK – Level Two)
18. Students will be able to find function values and complete function tables. (DOK – Level One)
19. Students will be able to determine whether a function is linear or nonlinear. (DOK – Level One)

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UNIT 3:

Big Idea # 1:

- Geometry: Understand congruence and similarity using physical models, transparencies, or geometry software. Understand and apply Pythagorean Theorem.

Big Idea #2:

- Expressions and Equations: Understand the connections between proportional relationships, lines, and linear equations.

Big Idea #3:

- Geometry: Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.

Mathematical Standard Areas:
Standard(s): Pennsylvania Core State Standards for Mathematics
Standards Addressed: CC.2.1.8.E.1, CC.2.1.8.E.4, CC.2.2.8.B.2, CC.2.3.8.A.3, CC.2.3.8.A.1, CC.2.4.8.B.1, CC.2.4.8.B.2

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

Overview: Geometry, Data Analysis
Goals:
Students will be able to write and solve equations using the Pythagorean Theorem.
Students will be able to graph transformations and find the volume of cylinders, cones and spheres.
Objectives:

1. Students will be able to use the Pythagorean Theorem. (DOK – Level Two)
2. Students will be able to solve problems using the Pythagorean Theorem. (DOK – Level Three)
3. Students will be able to find the distance between two points on the coordinate plane. (DOK – Level Two)
4. Students will be able to graph transformations: translations, reflections, rotations and dilations on the coordinate plane. (DOK – Level Three)
5. Students will be able to find the volume of cylinders, cones and spheres. (DOK – Level Two)
6. Students will be able to construct and interpret two-way tables. (DOK – Level Two)
7. Students will be able to find the measures of center and variation. (DOK – Level Two)

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UNIT 4:

Big Idea #1:

- Equations and Inequalities: Analyze and solve linear equations and inequalities and pairs of simultaneous linear equations, understand the connections between proportional relationships, linear equations and linear inequalities.

Big Idea # 2:

- The likelihood of an event occurring can be described numerically and used to make predictions.

Mathematical Standard Areas:
Standard(s): Pennsylvania Core State Standards for Mathematics

Standards Addressed: CC.2.1.8.E.1, CC.2.1.8.E.4, CC.2.2.8.B.2, CC.2.3.8.A.1, CC.2.2.8.B.3

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

Overview: Systems of Equations and Inequalities, Linear Inequalities, Probability

Goals:
Students will be able to solve equations algebraically using their understanding of operations with and properties of real numbers.
Students will be able to write and solve compound inequalities.
Students will be able to graph linear inequalities and systems of linear inequalities.

Objectives:

1. Students will be able to solve a systems of linear equations by substitution. (DOK – Level Three)
2. Students will be able to solve compound inequalities. (DOK – Level Three)
3. Students will be able to graph linear inequalities. (DOK – Level Two)
4. Students will be able to graph a system of linear inequalities. (DOK – Level Three)
5. Students will be able to solve word problems by applying probability principals. (DOK – Level Two)

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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 textbook and resources, manipulatives (such as Algebra Tiles), Venn Diagrams
    d. Guided practice

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

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

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

Assessments:

Diagnostic:
Textbook/Online Resources
Teacher prepared pre-test/diagnostic test
Teacher questioning and observation
CDT/Benchmark Assessment

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

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Summative:
Common Assessment for Units
Teacher made assessments
CDT

Extensions:
SAT Practice Problems (Question of the Day)
Enrichment Worksheets (Textbook Supplement and Kuta Software)
Study Island – preparation for Keystone Algebra 1 Assessment and PSSA

Correctives:
Re-teaching and practice worksheets available with textbook
Practice worksheets generated through Kuta Software
Study Island– preparation for Keystone Algebra 1 Assessment and PSSA

Materials and Resources:
Algebra 1 Common Core by Pearson Education, Inc. (2012)
Glencoe Math Course 3 (Volume 1 & 2)
Textbooks Online Resources
Teacher Generated Worksheets (Kuta Software)
USA Test Prep
Study Island – preparation for Keystone Algebra 1 Assessment and PSSA
CDT

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Textbook(s) Used for this Course of Instruction

Name of Textbook: **Glencoe Math Course** 3

Textbook ISBN #: 978-0-02-145425-9

Textbook Publisher & Year of Publication: McGraw-Hill 2016

Curriculum Textbook is utilized in (title of course): Glencoe Math Course 3

Name of Textbook: **Algebra 1 Common Core**

Textbook ISBN #: 978-0-13-318548-5

Textbook Publisher & Year of Publication: Pearson Education, Inc., 2012

Curriculum Textbook is utilized in (title of course): Math 8