A Planned Course of Study

for

Formal Geometry

ASHS Course # 0321

Abington School District

Abington, Pennsylvania

September, 2016

a. Objectives

Students will demonstrate the appropriate level of proficiency in each of the following areas:

A. Essentials of Geometry
- a. Measurement
- b. Distance

B. Reasoning and Proof
- a. Reasoning
- b. Proofs

C. Parallel and Perpendicular Lines
- a. Line Pair Relationships
- b. Linear Equations

D. Congruent Triangles
- a. Classify Triangles
- b. Proofs

E. Relationships within Triangles
- a. Coordinate Geometry
- b. Inequalities

F. Similarity
- a. Ratios and Proportions
- b. Methods of Similarity

G. Right Triangle Trigonometry
- a. Right Triangles
- b. Trigonometry

H. Quadrilaterals
- a. Classify Quadrilaterals
- b. Properties of Parallelograms

I. Properties of Circles
- a. Parts of a Circle
- b. Finding Arc and Angle Measure

J. Measuring Length and Area

a. Finding Length
b. Finding Area

K. Surface Area and Volume

a. Find Surface Area
b. Find Volume

b. Major Concepts

Students will demonstrate the appropriate level of proficiency in each of the following areas

A. Essentials of Geometry
- a. Measurement
  - i. Segments and Congruence
  - ii. Use Midpoint Formula
  - iii. Find Perimeter, Circumference, and Area
- b. Distance
  - i. Use Distance Formula
  - ii. Describe Angle Pair Relationships

B. Reasoning and Proof
- a. Reasoning
  - i. Inductive Reasoning
  - ii. Deductive Reasoning
- b. Proofs
  - i. Paragraph Proofs
  - ii. Two Column Proofs

C. Parallel and Perpendicular Lines
- a. Line Pair Relationships
  - i. Parallel Lines
  - ii. Perpendicular Lines
- b. Linear Equations
  - i. Slope
  - ii. Equations of Lines

D. Congruent Triangles

a. Classify Triangles
   i. By Sides
   ii. By Angles

b. Proofs
   i. SAS
   ii. SSS
   iii. AAS
   iv. ASA
   v. HL

E. Relationships within Triangles

a. Coordinate Geometry
   i. Perpendicular Bisectors
   ii. Angle Bisectors
   iii. Medians
   iv. Altitudes

b. Inequalities
   i. One Triangle
   ii. Two Triangles

F. Similarity

a. Ratios and Proportions
   i. Using Proportions to Solve Problems
   ii. Geometric Mean

b. Methods of Similarity
   i. AA
   ii. SSS
   iii. SAS

G. Right Triangle Trigonometry

- a. Right Triangles
  - i. Pythagorean Theorem
  - ii. Pythagorean Converse
- b. Trigonometry
  - i. Special Right Triangles
  - ii. Trigonometric Ratios

H. Quadrilaterals

- a. Classify Quadrilaterals
  - i. Find Angle Measures in Quadrilaterals
  - ii. Hierarchy of Parallelograms
- b. Properties of Parallelograms
  - i. Side Relationships
  - ii. Angle Relationships

I. Properties of Circles

- a. Parts of a Circle
  - i. Circle Vocabulary
- b. Finding Arc and Angle Measure
  - i. Central Angles
  - ii. Interior Angles
  - iii. Inscribed Angles
  - iv. Exterior Angles

J. Measuring Length and Area

- a. Finding Length
  - i. Perimeter
  - ii. Circumference
- b. Finding Area
  - i. Polygons
  - ii. Circles

K. Surface Area and Volume

a. Find Surface Area
    i. Prisms
    ii. Cylinders
    iii. Cones
    iv. Pyramids
    v. Spheres
b. Find Volume
    i. Prisms
    ii. Cylinders
    iii. Cones
    iv. Pyramids
    v. Spheres

III. Instruction

A. Course Schedule

a. 5 days a week
b. 45 minute classes

B. Pacing

a. Marking Period 1
    i. Essentials of Geometry (Chapter 1)
    ii. Reasoning and Proof (Chapter 2)
b. Marking Period 2
    i. Parallel and Perpendicular Lines (Chapter 3)
    ii. Congruent Triangles (Chapter 4)
    iii. Relationships within Triangles (Chapter 5)
c. Marking Period 3
    i. Similarity (Chapter 6)
    ii. Right Triangles and Trigonometry (Chapter 7)
    iii. Quadrilaterals (Chapter 8)

d. Marking Period 4
    i. Properties of Circles (Chapter 10)
    ii. Measuring Length and Area (Chapter 11)
    iii. Surface Area and Volume of Solids (Chapter 12)

C. Methods

a. Lecture
b. Cooperative learning
c. Mathematics software (Geogebra) and internet resources such as applets and math websites will be incorporated into the course using computers and Chromebooks.
d. Exploration and discovery lessons with and without technology
e. Homework
f. Pre-class assignments
g. Graphing calculator activities
h. Formative assessments and differentiation
i. Summative assessments
j. Data analysis of student results

D. Technology

a. Use of computers may be incorporated into the course.

b. Websites will be utilized as a source of e-text, virtual activities, and other online student resources connected to the course concepts.

E. Resources

a. Larson, R., Boswell, L., Kanold, T., Stiff, L. *Geometry*. McDougall Littell: Evanston, Illinois, 2007.
b. Ancillary materials from the text
c. Teacher made presentations, handouts, activities, practice, quizzes
d. Departmental chapter tests, midterm and final exam
e. Reference materials available in the mathematics office and the school library
f. Computer labs
g. Chromebooks
h. Websites such as Study Island, Khan Academy, Wolfram Alpha, Desmos, etc.
i. Google Classroom and Skyward
j. Graphing calculator class sets
k. Scientific calculators
l. Apperson scan sheets and software for test analysis

IV. Assessment

A. Procedures for Evaluation

a. Summative assessments
    i. A departmental common assessment will be administered at the end of each unit.
    ii. A departmental common assessment will be administered at the end of the course.
b. Formative assessments will be administered in a variety of formats.
c. Accommodations aligned with those permitted for the PSSA/Keystone Exams and included in IEP's will be provided for Special Education students who are enrolled in this course.

B. Expected Levels of Achievement

Students are expected to achieve at least a minimum level of proficiency. Proficiency and related grades are defined as follows:

A……..90 – 100%
B……..80 - 89%
C……..70 - 79%
D……..60 - 69%