

Pequannock Township School District

Curriculum Syllabus

Course Name and level / Grade level and Subject: Geometry Honors

Course Description:

This course is designed to give students an understanding of the nature of a mathematical system and an appreciation of the basic structure of geometry. Emphasis is placed on the role of the inductive and deductive reasoning in mathematical situations. It is expected that a student who successfully completes this course will have developed mastery and proficiency in the following areas: postulates and theorems of geometry, deductive reasoning of a proof, angle relationships areas and parallelism, proof of congruency in triangles, proof of similarity in polygons, computations of areas of polygons and circles, solution of numerical exercises relevant to circles, arcs, angles and segments, basic constructions, knowledge of coordinate geometry by determining equations of lines, simple probability, right triangle trigonometry, and volumes of solids. Students who successfully complete this course will have had the necessary practice in thinking abstractly which will be needed in the courses to follow.

Course Standards:

The following is a list of NJSLs that describe what students are expected to know and be able to do as a result of successfully completing this course. The following NJSLs are the basis of the assessment of student achievement. The learner will demonstrate mastery of:

Congruence

1. Experiment with transformations in the plane.
G.CO.A.1, G.CO.A.2, G.CO.A.3, G.CO.A.4, G.CO.A.5
2. Understand congruence in terms of rigid motions
G.CO.B.6, G.CO.B.7, G.CO.B.8
3. Prove geometric theorems
G.CO.C.9, G.CO.C.10, G.CO.C.11
4. Make geometric constructions
G.CO.D.12, G.CO.D.13

Similarity, Right Triangles, and Trigonometry

5. Understand similarity in terms of similarity transformations
G.SRT.A.1a-b, G.SRT.A.2, G.SRT.A.3,
6. Prove theorems involving similarity
G.SRT.B.4, G.SRT.B.5
7. Define trigonometric ratios and solve problems involving right triangles

G.SRT.C.6, G.SRT.C.7, G.SRT.C.8

8. Apply trigonometry to general triangles
G.SRT.D.9, G.SRT.D.10, G.SRT.D.11

Circles

9. Understand and apply theorems about circles
G.C.A.1, G.C.A.2, G.C.A.3, G.C.A.4
10. Find arc lengths and areas of sectors of circles
G.C.B.5

Expressing Geometric Properties with Equations

11. Translate between the geometric description and the equation for a conic section
G.GPE.A.1, G.GPE.A.2, G.GPE.A.3
12. Use coordinates to prove simple geometric theorems algebraically
G.GPE.B.4, G.GPE.B.5, G.GPE.B.6, G.GPE.B.7

Geometric Measurement and Dimension

13. Explain volume formulas and use them to solve problems
G.GMD.A.1, G.GMD.A.2, G.GMD.A.3
14. Visualize relationships between two-dimensional and three-dimensional objects
G.GMD.B.4

Modeling with Geometry

15. Apply geometric concepts in modeling situations
G.MG.A.1, G.MG.A.2

Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them. *SMP1*
2. Reason abstractly and quantitatively. *SMP2*
3. Construct viable arguments and critique the reasoning of others. *SMP3*
4. Model with mathematics. *SMP4*
5. Use appropriate tools strategically. *SMP5*
6. Attend to precision. *SMP6*
7. Look for and make use of structure. *SMP7*
8. Look for and express regularity in repeated reasoning. *SMP8*

Scope and Sequence

Unit 1-Measurement, Coordinate Geometry, and Transformations (MP1)

Students will build a foundation for learning geometry through defining and visualizing

important terms, exploring postulates and properties, and measuring segments and angles. Students will need a good foundation before they can understand how to prove theorems.

Unit 2-Constructions, Congruence, Similarity, Reasoning and Proofs (MP2 and MP3)

Students will be able to determine if two figures are congruent or similar. Proving that figures are either congruent or similar will help us to prove more important geometric theorems.

Unit 3-Similarity, Trigonometric Ratios, and Geometric Equations (MP3 and MP4)

Similarity preserves angle measure and similar figures have corresponding sides in proportion. Many theorems can be proven by setting up proportions based on similar figures.

Unit 4-Geometric Modeling (MP4)

Students will understand where the formulas for area and volume come from and have a choice of whether to use the formulas or break it down into composite figures. Students will have a better understanding of geometric formulas if they see the derivation.

*Geometry Honors activities will include more in-depth exploration of each of these topics, including more application of skills.

Assessments

Evaluation of student achievement in this course will be based on the following:

- a. In class assessments
*Geometry Honors assessments will include more in-depth application of geometry skills learned
- b. Online assignments
- c. Projects

Curriculum Resources

Instructional Resources:

Pearson Textbook

Technology Resources:

www.geogebra.org

<https://teacher.desmos.com/>

www.illustrativemathematics.org

Home and School Connection

The following are suggestions and/or resources that will help parents support their children:

- Tutorials: www.khanacademy.com
- Resources from textbook: <https://www.pearsonsuccessnet.com/>
- Practice problems; <https://www.kutasoftware.com/>
- Teacher's Google Classroom