



Greenwich Public Schools Curriculum Overview

Geometry B

Personalized learning is achieved through standards-based, rigorous and relevant curriculum that is aligned to digital tools and resources.

Note: Teachers retain professional discretion in how the learning is presented based on the needs and interests of their students.

Course Description

Geometry B

Full Year

023100

6 Blocks

1 Credit

Prerequisite: Extended Algebra or Algebra 1

This course covers the core topics of geometry and has time built into the course to benefit those who are challenged by the traditional pace of the Geometry A curriculum. This course is an axiomatic study of plane figures in Euclidean Geometry. Topics include geometric reasoning, parallel and perpendicular lines, triangles, similarity, right triangle trigonometry, polygons, three-dimensional solids, circles, and congruence.

Unit Guide

Unit 1: Transformations and the Coordinate Plane

Unit 2: Congruence, Proof, and Constructions

Unit 3: Polygons

Midterm Review & Midterm Exam*

Unit 4: Similarity, Proof, and Trigonometry

Unit 5: Circles and Other Conic Sections

Unit 6: Extend to Three Dimensions

Final Review & Final Exam*

**Note on Semester Exams:* Exam review packets, answer keys and formula sheets can be found by joining our Schoology Math Department Review Course, using COURSE access code P9V9X-H6V37.

Mathematical Practices

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.

Enduring Understandings

- *Unit 1:* Understand basic geometric vocabulary including points, lines, and planes.
- *Unit 1:* To experiment with transformations in the plane and understand similarity in terms of rigid transformations.
- *Unit 1:* Apply concepts of algebra to the geometric plane.
- *Unit 2:* Understand congruence in terms of rigid motions and prove geometric theorems.
- *Unit 2:* Decide if two shapes are congruent.
- *Unit 3:* Classify polygons, triangles, quadrilaterals. Use properties to determine information about the figure.
- *Unit 4:* Prove theorems involving similarity and define trigonometric ratios and solve real world problems involving right triangles.
- *Unit 5:* Understand and apply theorems about circles. Graph and translate circles.
- *Unit 6:* Use understanding of geometry to calculate area of polygons.
- *Unit 6:* Explain volume formulas and use them to solve problems AND apply geometric concepts in modeling situations.

Essential Questions

Unit 1:

- What is the relationship of points, lines and planes? How can points, lines and planes be identified?
- How can parallel and perpendicular lines be defined?
- How can equations of parallel and perpendicular lines be calculated?
- How can the midpoint and distance between two points be calculated?
- How can the distance concept be expanded to two dimensional figures in terms of perimeter and area?
- How are angles named, measured, and classified?
- How can different transformations be modeled and compared?
- How can rigid motion be defined?

Unit 2:

- What is a postulate and how does it relate to geometric diagrams?
- What are the different pairs of angle relationships?
- What types of angles are formed by two lines and a transversal?
- What types of angles are formed by parallel lines and a transversal?
- How do segment and angle bisectors relate to the properties of congruence?
- How does rigid motion relate to triangle congruence?
- What are the different ways to prove triangles congruent?
- How can congruent triangles help to find missing corresponding parts?

Unit 3:

- How do we name polygons and triangles?
- How do we derive the formula for the sum of the interior and exterior angles of any convex polygon?
- What are some special properties of triangles?
- How do you solve problems involving relations within triangles?
- What are the properties of the different quadrilaterals?
- How do you use coordinate geometry to find relationships within quadrilaterals?
- How do you show that a quadrilateral is a {parallelogram, rectangle, square, rhombus, trapezoid, or kite}?

Unit 4:

- How was the Pythagorean Theorem developed and how does the converse help determine what type of triangle is in a problem?
- What are the relationships in the two special right triangles?
- How do the ratios of triangle side lengths compare to one another?
- How do the trigonometric ratios relate to the right triangle? How can you use the angle of elevation and angle of depression with trigonometric ratios?
- How can the measure of the angles in a right triangle be calculated using the ratios?
- How can you evaluate trigonometric functions at any angle?
- How can the trigonometric ratios be applied to find side lengths in right triangles and to solve real-world problems?
- How are ratios, proportions and the geometric mean related?
- How can proportions be used to solve geometry problems?
- What is the relationship between congruence and similarity?
- What methods are used to show that triangles are similar?
- How can proportionality concepts be used to solve real-world problems?

Unit 5:

- What are the characteristics of a circle?
- What are the different relationships formed between angles and circles when they intersect?
- What is the relationship between angle and arc measures?
- What are all the relationships of angles in a circle and chords, secants, and tangents?
- What is the relationship between chords, arcs, and other segments in a circle?
- How can you use the central angle to find the arc length and area of a sector?
- How do you use central angle and radius to find the arc length or the area of a sector in a circle?

Unit 6:

- How can the area of triangles, parallelograms, trapezoids, rhombi, and kites be calculated?
- How do you use the area of figures to find surface area and volume?
- What are the characteristics of theoretical, experimental and geometric probability?
- What is a regular polygon and how can the characteristics help you calculate the area?
- What are the characteristics of solid figures?
- How can the surface area of prisms and cylinders be calculated?
- How can the surface area of pyramids and cones be calculated?
- What is the difference between volume and surface area and how can the volume be calculated?
- What are the characteristics of a sphere and how can the surface area and volume be calculated?
- How do we use surface area and volume to model real life and mathematical situations?

Resources and Assured Experiences

Textbook Information:

Geometry Concepts and Skills
McDougal Littell (2010)
ISBN 0-618-50157-6

GHS Capstone Task:

[Vision of the Graduate](#) #3 - Explore, define, and solve complex problems
Student Center Columns - to complete after Unit 4: Similarity, Proof & Trigonometry

Extra Resources:

- www.ccsmath.org A great resource for CCSS standards tied directly to lessons and activities (Khan Academy, NCTM Illumination, Shmoop, etc...)
- <https://commoncoregeometry.wikispaces.hcpss.org/> Website by another district, aligned to CCSS with many lessons and activities
- <http://map.mathshell.org/materials/index.php> - Website full of project based learning activities
- <http://moodle.tbaisd.org/course/view.php?id=871> Website from Michigan with many lessons and activities
- <https://www.illustrativemathematics.org/HSG> - Aligned with CCSS
- <http://www.ixl.com/math/geometry> - Cool website, that has online questions for tons of concepts - and the questions get harder if you get it right, if you get it wrong, it fully explains
- <https://www.khanacademy.org/commoncore/map> - Khan Academy
- Kuta Software
- <http://mathbits.com/caching/geoopenecache1.html> - Game that incorporates geometry skills. Great for review.
- <http://geometry.mrmeyer.com/> Three act math: Full of complete project based learning activities.
- <https://docs.google.com/spreadsheets/ccc?key=0AjlqyKM9d7ZYdEhtR3BJMmdBwnM2YWxWYVM1UWowTEE#gid=0>
- www.sophia.org Another resource that can be used by the teacher to set up classes and track performance in a game-like manner.
- <http://robertkaplinsky.com/lessons/> - Also project based learning activities
- <http://math.buffalostate.edu/~it/projects.html> - Website full of various projects
- <http://www.geogebra.org> Geometry software that reinforces learned skills.

Quarterly Grading - Quarter Grades will be determined using the following components:

- Participation (includes Classwork) = 20%
- Preparation (includes Homework) = 20%
- Assessments (both Summative & Formative) = 60%

Connecticut Common Core State Standards

- Unit 1: CCSS.MATH.CONTENT.HSG.CO.A.1, A.2, A.3, A.4, A.5; HSG.GPE.B.4, B.5, B.6, B.7.
- Unit 2: CCSS.MATH.CONTENT.HSG.CO.B.6, B.7, B.8, B.9, C.9, D.12.
- Unit 3: CCSS.MATH.CONTENT.HSG.CO.C.10, C.11, D.13.
- Unit 4: CCSS.MATH.CONTENT.HSG.SRT.A.1, A.1.A, A.1.B, A.2, A.3, B.4, B.5, C.6, C.7, C.8; HSG.MG.A.3
- Unit 5: CCSS.MATH.CONTENT.HSG.GPE.A.1, B.4; HSG.C.A.1, C.A.2, C.A.3, C.B.5.
- Unit 6: CCSS.MATH.CONTENT.HSG.GMD.A.1, A.3, B.4; HSG.MG.A.1, A.2.