Geometry
Mathematics

Key Instructional Activities

In high school, students will develop a deep understanding of mathematical concepts and use mathematical ways of thinking to solve real-world problems. Unlike previous grades where learning objectives are organized by grade level, high school learning objectives are organized by concepts—such as geometry and probability—that students will learn and master in various mathematics courses. These concepts build on what students learned in middle school and move toward greater depth of knowledge and skills throughout high school. Geometry is the second course in a sequence of three required high school courses designed to ensure career and college readiness. The course represents a discrete study of geometry with correlated statistics applications

Here's a brief snapshot of some of the work students will be doing in these areas:

- Understanding and proving geometric *theorems* (mathematical statements whose truth can be proven on the basis of previously proven or accepted statements)
- Using algebraic reasoning to prove geometric theorems
- Applying geometric concepts to model real-life situations
- Understanding the rules of *probability* and using them to interpret data and evaluate the outcomes of decisions
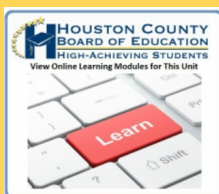

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What resources are available for students and parents?

https://hcbemath.weebly.com/

- ✓ Online Math Textbook
- ✓ Parent Portal
- ✓ Overview of Units and Pacing
- ✓ The Learn Button!

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View Online Learning Modules for This Unit

What is the Learn Button on the Weebly Site? *Link to Georgia Virtual School Modules for instructional videos, examples, and practice by unit.*

Geometry Course Overview

Unit 1: Transformations in the Coordinate Plane
Expected Dates: Beginning of School Year to Mid-August

Building on standards from middle school, students will perform transformations in the coordinate plane, describe a sequence of transformations that will map one figure onto another, and describe transformations that will map a figure onto itself. Students will compare transformations that preserve distance and angle to those that do not.

Unit 2: Similarity, Congruence, and Proofs
Expected Dates: Mid-August to November

Building on standards from Unit 1 and from middle school, students will use transformations and proportional reasoning to develop a formal understanding of similarity and congruence. Students will identify criteria for similarity and congruence of triangles, develop facility with geometric proofs (variety of formats), and use the concepts of similarity and congruence to prove theorems involving lines, angles, triangles, and other polygons.

Unit 3: Right Triangle Trigonometry
Expected Dates: December

Students apply similarity in right triangles to understand right triangle trigonometry, with particular attention to special right triangles and the Pythagorean Theorem.

Unit 4: Circles and Volume
Expected Dates: January to Mid-February

Students will understand and apply theorems about circles, find arc lengths of circles, and find areas of sectors of circles. Students will develop and explain formulas related to circles and the volume of solid figures and use the formulas to solve problems. Building on standards from middle school, students will extend the study of identifying cross-sections of three-dimensional shapes to identifying three-dimensional objects generated by rotations of two-dimensional objects.

Unit 5: Geometric and Algebraic Connections
Expected Dates: Mid-February to Mid-March

Students will use the concepts of distance, midpoint, and slope to verify algebraically geometric relationships of figures in the coordinate plane (triangles, quadrilaterals, and circles). Students will solve problems involving parallel and perpendicular lines, perimeters and areas of polygons, and the partitioning of a segment in a given ratio. Students will derive the equation of a circle and model real-world objects using geometric shapes and concepts.

Unit 6: Applications of Probability
Expected Dates: Mid-March to End of School Year

Building on probability concepts that began in the middle grades, students use the languages of set theory to expand their ability to compute and interpret theoretical and experimental probabilities for compound events, attending to mutually exclusive events, independent events, and conditional probability. Students should make use of geometric probability models wherever possible.

Helpful Tips for Parents and Guardians

Believe that every child can be successful in math. It takes good teaching, coaching, encouragement and practice.

Partnering with your child's teacher

• Get to know your child's math teacher! Your child will thank you (someday) for being involved in his or her learning. Also – know about the online resources that are available!

• Don't be afraid to reach out to your child's teacher—you are an important part of your child's education. Ask to see a sample of your child's work or bring a sample with you.

• Talk with your child's teacher about difficulties he/she may be experiencing. When teachers and parents work together, children benefit.

• Ask the teacher questions like:

• Where is my child excelling? How can I support this success?

• What do you think is giving my child the most trouble? How can I help my child improve in this area?

• What can I do to help my child with upcoming work?

Helping your child learn outside of school

• Talk about math in a positive way. A positive attitude about math is infectious. Encourage your child to stick with it whenever a problem seems difficult. This will help your child see that everyone can learn math.

• Encourage persistence. Some problems take time to solve. Praise your child when he or she makes an effort, and share in the excitement when he or she solves a problem or understands something for the first time

• Encourage your child to experiment with different approaches to mathematics. There is often more than one way to solve a math problem.

• Encourage your child to talk about and show a math problem in a way that makes sense

• When your child is solving math problems ask questions such as: Why did you...? What can you do next? Do you see any patterns? Does the answer make sense? How do you know? This helps to encourage thinking about mathematics.

• Connect math to everyday life and help your child understand how math influences them.

• Play family math games together that add excitement such as checkers, junior monopoly, math bingo and uno.

• Computers + math = fun! There are great computer math games available on the internet that you can discover with your child.