Course Description

The learning opportunities and instruction in Geometry are designed to help students grow into more confident and competent practitioners of 21st century mathematics. Course content is aligned with the Colorado Academic Standards. These standards describe what all high school graduates should know and be able to do to ensure success in postsecondary and workforce settings.

The Geometry program (text: Core Connections Geometry, College Preparatory Mathematics ©2013) aims to formalize and extend the geometry that students have learned in previous courses. It does this by focusing on establishing triangle congruence criteria using rigid motions and formal constructions, building a formal understanding of similarity based on dilations and proportional reasoning, developing the concepts of formal proof, exploring the properties of two- and three-dimensional objects, working within the rectangular coordinate system to verify geometric relationships, proving basic theorems about circles, and using the language of set theory to compute and interpret probabilities for compound events.

On a daily basis, students in Core Connections Geometry use problem solving strategies, questioning, investigating, analyzing critically, gathering and constructing evidence, and communicating rigorous arguments justifying their thinking. Students learn in collaboration with others, sharing information, expertise, and ideas.

Course Objectives

Upon completing this course, students should be able to:

- Pose mathematical questions, such as “What if…?” meaningfully and appropriately.
- Make conjectures and prove their validity.
- Recognize and represent patterns mathematically or in prose.
- Apply geometry to model and solve problems in both mathematical and real-world contexts.
- Critique a logical argument.
- Communicate their mathematical understanding effectively and formulate complete, logical arguments to support their conclusions.
- Use algebra to formulate and solve equations arising from geometric situations both on and off a coordinate grid.

Key concepts addressed in this course are:

- Transformations (reflection, rotation, translation, dilation) and symmetry
- Relationships between figures (such as similarity and congruence) in terms of rigid motions and similarity transformations
- Properties of plane figures
- Prove geometric theorems (investigate patterns to make conjectures, and formally prove them)
- Modeling with geometry
- Using coordinates to prove geometric theorems
- Measurements of plane figures (such as area, perimeter, and angle measure)
- Theorems about circles, including arc lengths and areas of sectors
- Measurements of three-dimensional shapes (such as volume and surface area)
- Tools for analyzing and measuring right triangles, general triangles, and complex shapes (such as the Pythagorean Theorem, trigonometric ratios, inverse trigonometry, and the Laws of Sines and Cosines)
- Geometric construction (with compass and straightedge)
- Algebra (with substantial review of writing and solving equations and multiple representation of functions)
- Probability (independence and conditional probability, compound events, expected value, and permutations and combinations)

**Classroom Behavior Requirements**

- Students must be in their seats when both the starting and exit bells ring to avoid tardiness and late dismissal from class.
- Electronic devices must be used only with teacher permission for calculation, math research, and/or note-taking purposes. No social networking. Only graphing calculators can be used on tests.
- No eating or flavored drinks allowed in the classroom. Water only.
- Sit quietly; wait for instructions. Check board for and listen carefully to instructions.
- Take turns talking during whole group discussions. Raise your hand for attention.
- Work cooperatively in teams according to your team role to accomplish the team task.
- Respect others’ property, space, and opportunity to learn. No disruptions.
- Students must bring their textbook, pencil, designated math notebook, graph paper, and calculator (TI-83 graphing calculator recommended for all classes).

**Grading**

In Geometry, we value:

- **Mathematical Understanding:** Understanding is a prerequisite to remembering, connecting, and using mathematics.
- **Skill Proficiency:** Skills are necessary to succeed at the mathematical tasks that students will encounter in these courses and beyond.
- **Problem Solving:** Our students need to learn to use what they know and think logically about problems to devise effective strategies to find solutions.
- **Communication:** Our students need to be able to use mathematical language and talk and write about their ideas effectively.
- **Justification:** Our students should be able to give logical arguments to defend their reasoning both orally and in writing.
- **Mastery Over Time:** We expect our students to continue to build broader and deeper understanding of the ideas in each course as the year progresses.
- **Multiple Ways of Seeing:** We value breadth of thinking. Our students should seek, find, hear, and understand multiple ways to think about a given mathematical task.
- **Effective Teamwork:** In order to achieve many of the above-mentioned goals, our students need to work together. They need practice talking about mathematics and building deeper understanding by listening to the reasoning of other students. Therefore, it is essential that we place high value on students learning to work cooperatively.
A broad range of values necessitates a broad range of assessment tools with the indicated weights:

**Individual Tests/Quizzes – 40% of semester grade** (Semester tests are 10% of the semester grade)

**Team Tests/Quizzes – 30%** (Individual test score replaces team score if the individual score is higher)

**Homework and Individual Projects** (including Learning Log and Math Notes) – 30%

Homework is due the day after it is assigned. Work turned in after one week from assignment date will receive 80% of the homework score. Grade summaries are available online at www.goedustar.com. The counselor will help students set up their goedustar account. Extra credit is available to all students at the teacher’s discretion.

In addition to help at a prearranged time before or after school, students are encouraged to explore the homework and extra practice resources available online at www.cpm.org under Student Support, Homework Help, Traditional High School, *Core Connections Geometry*. Parent e-books containing problem-solving explanations, examples, practice problems, and answers are available for purchase on the CPM website. Other helpful math websites include Purple Math, Khan Academy, Math Warehouse, and the West Custer County Library.

Below is the 5-point rubric with which homework sets and test problems will be scored:

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<tr>
<th>Score</th>
<th>Criteria</th>
<th>Minimum % Score</th>
<th>Letter Grade</th>
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| 5     | • Fully Accomplishes the Purpose of the Task  
       • Student work shows full grasp and use of the central mathematics idea(s)  
       • Recorded work communicates thinking clearly using some combination of written, symbolic, or visual means. | 89.60 | A |
| 4     | • Substantially Accomplishes the Purpose of the Task  
       • Student works shows essential grasp of the central mathematics idea(s)  
       • Recorded work in large part communicates the thinking. | 79.60 | B |
| 3     | • Partially Accomplishes the Purpose of the Task  
       • Student work shows partial but limited grasp of the central mathematics idea(s)  
       • Recorded work may be incomplete, somewhat misdirected, or not clearly presented. | 69.60 | C |
| 2     | • Makes Little Progress Toward Accomplishing the Task  
       • Shows little or no grasp of the central mathematics idea(s)  
       • Recorded work is barely comprehensible, frequently incomplete, or occasionally missing. | 59.60 | D |
| 1     | • Makes No Progress Toward Accomplishing the Task  
       • Shows no grasp of the central mathematics idea(s)  
       • Recorded work is incomprehensible, consistently incomplete, or frequently missing. | 0 | F |