Geometry

(2 semester course)

Teacher Contact Information

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Course Goals and Big Ideas

Geometry is the math course between algebra I and algebra II that examines logic and visual relationships including triangles, circles, area, and volume. Upon successful completion of the course, students will be able to:

-Visualize and verbalize relationships on a plane and in space

-Quantitatively solve problems involving angles, triangles, circles, and other figures

-Logically use inductive reasoning and deductive reasoning to hypothesize and prove statements

-Refresh and extend the skills necessary to be successful in algebra II, trigonometry, calculus, chemistry, physics, and other courses dependent upon math

Course Materials

The textbook is entitled Geometry: Common Core. It is published by Pearson and is in its 3rd year of use here at Hartem. Mastering the materials in this book will ensure the students will be ready for algebra II, then upper level math courses, as well as common everyday mathematical problems in life. There will be supplemental worksheets that accompany this text along with online materials which can be accessed through the Hartem website – hartem.org.

The students will need some other materials in additions to the normal pencil and paper. These include: a scientific calculator, spiral notebook, folder or binder, and graph paper. Compasses, protractors, and rulers will be supplied and used often.

How to Get Help

In order to be successful in geometry, a student should participate in class by asking questions during explanations. Additionally, students should take notes during lectures in order to supplement the textbook examples. Usually assignments are started in class and students will have time to ask questions from me during this time. There are also some online resources mentioned above that can assist students.

Assignments

Students will be given problems about 80% of the school days. Most assignments are started in class and gifted students may be able to complete these assignments on many days. However, most students will need to spend an additional amount of time outside of class to finish the assignment. Some assignments are graded for completion, meaning the students need to show work and have an answer for every problem assigned. Some assignments will checked for correctness, meaning the students will turn in 3 problems from the current assignment after they've had a chance to check their answers and ask questions about said assignment.

Grading

Homework assignments are worth 3 points. If it is a completion assignment, 3 points will be earned if all work and answers are present. 0 points will be given if nothing is done. 1 and 2 points will be earned dependent upon the partial work done. If it is checked for correctness, the number of correct problems done will correspond to the points earned.

Quizzes will be given on a regular basis, approximately once every week to two weeks. They will range in value from 15 - 50 points and will be turned in to be graded for correct work and answers.

Tests are all worth 100 points and will be given after every chapter. There are also 2 semester exams which come at the conclusion of each semester. They are worth 1/7 of the semester grade.

Classroom Procedures, Behavior Expectations, and Consequences

I expect students to be in or near their seats at the start of class with all of their necessary materials. After the bell has rung, I expect students to be in their seat, have stopped talking, and have the correct materials out ready for that period. I expect students to talk in turn

and learn to listen as others voice their questions or views. I expect students to show respect for the teacher and the other students.

If these procedures and expectations are not met, a verbal warning will be given unless a more serious consequence is warranted. After multiple warnings, a detention will be issued. If the student is still not following classroom procedures and behaviors, a meeting with the parents and principal will be scheduled.

First Semester Schedule (approximate)

The course begins with chapter one, which is titled "Tools of Geometry". As the name implies, the chapter covers basic elements and concepts used in geometry such as: points, lines, planes, angles, perimeter, and area. There will be new vocabulary words, like most chapters, and new topics that include nets, isometric drawings, and orthographic drawings.

Chapter two is titled "Reasoning and Proof". This chapter will introduce inductive and deductive reasoning, conditional statements, and truth tables. Students will learn how to solve problems to find angle measures and how to construct simple proofs.

Chapter three is titled "Parallel and Perpendicular Lines". Theorems for parallel and perpendicular lines will introduced and used.. New proofs and constructions concerning lines will also be presented. In addition, slopes, intercepts, and equations of lines will be explored.

Chapter four is titled "Congruent Triangles". Much of this chapter involves using two column proofs to prove triangles congruent and then to state that corresponding parts those triangles are congruent. Special properties of isosceles, equilateral, and right triangles are also investigated.

Chapter five is titled "Relationships Within Triangles". Midsegments, bisectors, medians, and altitudes will be defined and related problems solved. Indirect proofs and triangle inequalities will also be taught.

Chapter six is titled "Polygons and Quadrilaterals". The chapter covers properties of parallelograms, rhombuses, rectangles, squares, trapezoids, and kites. The angle-sum theorem and polygons in the coordinate plane are also highlighted concepts.

Second Semester Schedule

Chapter seven is titled "Similarity". This chapter begins with a review of ratios and proportions including solving quadratic equations. Examples and problems are then presented using similar polygons that create proportions. Triangles are proven similar and similar right triangles are explored.

Chapter eight is titled “Right Triangles and Trigonometry”. This chapter begins with the Pythagorean Theorem. Special right triangles and the six trigonometry ratios are presented. Applications with angles of elevation and depression, as well as the sine and cosine laws are used.

Chapter nine is titled “Transformations”. The transformations studied are translations, reflections, rotations, and their compositions. Isometries, reductions, and dilations are also studied.

Chapter ten is titled “Area”. Areas of polygons are first looked at. Next, areas of circles and sectors are found. Perimeter and circumferences are also investigated. Geometric probabilities, along with inscribed and circumscribed figures are introduced.

Chapter eleven is titled “Surface Area and Volume”. Surface area and volumes of prisms, cylinders, pyramids, cones, and spheres are calculated.

Chapter twelve is titled “Circles”. Tangent and secant lines are explored along with chord and arcs. Problems involving angle measures and segment lengths in circles are introduced.

Tips for Success

- Ask questions during the explanations. Questions keep you an active learner and help you focus on the task at hand. If you have a question, chances are someone else has the same question and you will be helping them as well.

- Take good notes each day. It is a skill you need to develop for all classes in high school and beyond.

- Seek help from me, another teacher, a fellow student, or some other knowledgeable adult. The first step after I’ve taught a lesson is to try the problems yourself. After you’ve tried a few times, it is helpful to then get assistance from others.

- Geometry has a lot of vocabulary. It is wise to write these terms down and learn their unique meanings.

- When you get a quiz or test back, consider it another opportunity to learn. Go back over the test until you thoroughly understand the material. Math is a cumulative subject and anything that you struggle with will continue to give you problems.

- Do not waste time worrying about the value of the mathematics studied. Math is an important subject that gives you skills which you will need, not only in higher education, but everyday life.