



Reseda High School Police Academy Magnet Geometry A/B

Instructor: Mr. Ethington

Course Description:

In Geometry A/B, while integrating *law enforcement themes*, we will learn about properties of many basic shapes and forms in two and three dimensions, as well as how to apply these properties. We will also develop logical thought processes with emphasis on reasoning and logical arguments leading to geometric proofs.

Topics of Instruction:

Unit 1: Foundations of geometry and geometric proof

CA Content Standards: 1.0, 2.0, 3.0, 4.0, 7.0, 13.0, 17.0

Undefined terms

Pieces of lines and associated properties, postulates, and theorems

Radius of a search area

Angles and associated properties, postulates, and theorems

Proofs of congruent segments and angles

Parallel lines cut by a transversal and associated properties, postulates, proofs, and theorems

Solving a crime at Reseda High, "Where did the shot come from?"

Unit 2: Triangles and other polygons

CA Content Standards: 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 12.0, 13.0

Categorizing triangles and their associated parts

Basic triangle properties, postulates, proofs, and theorems

Congruence and similarity of triangles and corresponding parts

Relationships between angles of polygons, and number of sides of polygons

Congruence and similarity of polygons and corresponding parts

Unit 3: Right triangles, the Pythagorean Theorem, and trigonometry

CA Content Standards: 2.0, 3.0, 4.0, 5.0, 14.0, 15.0, 17.0, 18.0, 19.0, 20.0

The Pythagorean Theorem and finding sides of right triangles

Radius of a search area revisited

Proving the Pythagorean Theorem

Using special case right triangles

Using trigonometry to find sides of right triangles

Sniper problems

Approximating suspect height

Proving trigonometric properties and laws

Unit 4: Circles

CA Content Standards: 7.0, 8.0, 17.0, 21.0

Properties of lines and angles on circles

Arcs and sectors

Circumference and area of circles

Search area once again

James Bond problems

Arc length and sector area

Unit 5: Parallelograms

CA Content Standards: 2.0, 3.0, 4.0, 7.0, 8.0, 10

Categorizing parallelograms and their associated parts

Basic parallelogram properties, postulates, proofs, and theorems

Congruence and similarity of parallelograms and corresponding parts

Unit 6: Perimeter, area, and volume of polygons and polyhedrons

CA Content Standards: 7.0, 8.0, 9.0, 10, 11.0

Perimeter and area of common polygons

More James Bond problems

Lateral area and surface area of prisms and cylinders

Lateral area and surface area of cones and pyramids

Surface area of spheres and hemispheres

Volume of prisms, cylinders, cones, pyramids, spheres, and hemispheres

Even more James Bond problems

Unit 7: Constructions, Transformations, and Logic

CA Content Standards: 1.0, 3.0, 16.0, 22.0

Constructing basic geometric shapes

Deconstructing someone else's construction

Translations, Reflections, and Rotations

The parts of logical statements

Negations, inverse, converse, and Contrapositive of statements

Counterexamples

Refuting an alibi

Deductive vs. Inductive logic

Following a hunch vs. just the facts

Grading

Standard grade cutoffs are used, A: 90% and up, B: 80% to 89%, C: 70% to 79%, D:60% to 69%, F: 59% and below.

Attendance, Cooperation and Work Habits

You are required to follow the attendance policy of the school. Your attendance will have a direct connection to your semester grade. You will receive participation points that are determined on whether your are in class or not. If you are not in class you cannot

participate. Attending class is very important, especially since the institution of block schedule. Absent students will miss opportunities to receive in class participation and classwork points, as well as missing out on instructional time, and each day of instruction with block schedule is equivalent to two traditional days of class. In order to be successful, you must attend class on a regular basis.

Exams must be made up the day you return to school. Missed quizzes will result in a zero with the following quiz counting double. Missing more than two quizzes in a semester will result in a written and oral report on the quiz subject matter for each missed quiz. Quiz make-ups must be turned in within one day of returning to school.

Cooperation and respect are expected at all times. Compliance with school and classroom rules is required. Deviation from behavior requirements will result in class suspension.

Assignment Types

Students will be graded by tests, quizzes, classwork, homework, projects, and participation as follows:

Tests -	50%	Classwork -	15%
Projects -	12%	Homework -	5%
Quizzes -	10%	Participation -	8%

Homework and Classwork Policy

All classwork and homework will be assigned during class, and is due the first day of the following week, at which time the teacher will select one assignment to collect and grade. To receive full credit for an assignment, the assignment must be complete, written neatly in pencil, with all steps shown, and most of the work correct. In the event that a student does not have the required assignment on the date due, they may receive up to 60% of the original grade by turning in all of the assignments issued during the previous week within ten school days of the original due date. Students who are absent on the date the work was collected may receive 100% of the original grade by turning in all of the assignments issued during the previous week within ten school days of the original due date. Students who are absent for any reason are expected to get all missed notes and assignments from the teacher or from other students.

All student work must be that of the individual student. CHEATING of any type will not be tolerated. This applies to ANY and ALL assignments. Any incidence of cheating will result in parent conferencing, a zero on the assignment (for all students(s) involved) and a “U” in both work habits and cooperation on the 5, 10, 15 and 20 week report cards.

Reseda High School ESLRS

In my class, students do much of their work in cooperative learning groups. I believe this type of activity helps students to learn from each other, and helps students achieve the Reseda High School ESLRS:

- *Effective Communicators
- *Critical Thinkers
- *Self-Directed Learners
- *Responsible Citizens

*Healthy Individuals

CA State Content Standards:

- 1.0 Students demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning.**
- 2.0 Students write geometric proofs, including proofs by contradiction.**
- 3.0 Students construct and judge the validity of a logical argument and give counterexamples to disprove a statement.**
- 4.0 Students prove basic theorems involving congruence and similarity.**
- 5.0 Students prove that triangles are congruent or similar, and they are able to use the concept of corresponding parts of congruent triangles.**
- 6.0 Students know and are able to use the triangle inequality theorem.**
- 7.0 Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.**
- 8.0 Students know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.**
- 9.0 Students compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres; and students commit to memory the formulas for prisms, pyramids, and cylinders.**
- 10.0 Students compute areas of polygons, including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.**
- 11.0 Students determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids.**
- 12.0 Students find and use measures of sides and of interior and exterior angles of triangles and polygons to classify figures and solve problems.**
- 13.0 Students prove relationships between angles in polygons by using properties of complementary, supplementary, vertical, and exterior angles.**
- 14.0 Students prove the Pythagorean theorem.**
- 15.0 Students use the Pythagorean theorem to determine distance and find missing lengths of sides of right triangles.**
- 16.0 Students perform basic constructions with a straightedge and compass, such as angle bisectors, perpendicular bisectors, and the line parallel to a given line through a point off the line.**
- 17.0 Students prove theorems by using coordinate geometry, including the midpoint of a line segment, the distance formula, and various forms of equations of lines and circles.**
- 18.0 Students know the definitions of the basic trigonometric functions defined by the angles of a right triangle. They also know and are able to use elementary relationships between them. For example, $\tan(x) = \sin(x)/\cos(x)$, $(\sin(x))^2 + (\cos(x))^2 = 1$.**
- 19.0 Students use trigonometric functions to solve for an unknown length of a side of a right triangle, given an angle and a length of a side.**
- 20.0 Students know and are able to use angle and side relationships in problems with special right triangles, such as 30° , 60° , and 90° triangles and 45° , 45° , and 90° triangles.**
- 21.0 Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.**

22.0 Students know the effect of rigid motions on figures in the coordinate plane and space, including rotations, translations, and reflections.