



The Facing History School

Geometry 3 Syllabus



Teacher: Colleen

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Description:

This course will strengthen critical thinking and logic in students as they learn geometry concepts through inquiry. We will explore topics in geometry to understand their connection to the world around us. Students will learn how to develop a convincing argument and understand the root of mathematical concepts by proving theorems and rules themselves.

Units of Study:

Unit 1: Basics of Geometry at FHS

Unit 2: Right Triangles

Unit 3: Triangles & Quadrilaterals

Unit 4: Transformations

Classroom Policies:

- ❖ Be on time.
- ❖ Do not talk when someone else is talking.
- ❖ Come prepared with required classroom materials.
- ❖ Stay on task
- ❖ NO CELL PHONES
- ❖ Be in uniform
- ❖ Always be courteous, considerate, and respectful toward others and their property.

Classroom Procedures and Expectations:

1. Tardies

A student is tardy to class if they are not physically in the classroom and ready to begin when the bell rings (Except for first period, tardy after 9:00 am). After 3 tardies, there will be a conference with dean and guidance counselor and parent/guardian will be called.

When late, student must have a pass. If you do not have a pass, you will be marked as an unexcused tardy.

2. Absent to Class

Planned Absence \equiv you know you are going to be absent (e.g. doctor's appointment)

Make sure you let me know so I can give you the missing work. Documentation must be provided at your return.

Unplanned Absence = you are absent but did not anticipate or expect it (e.g. illness)
You must email your teachers and at your return, you must make up the missing work.

3. Headphones

Headphones should not be visible on your body. Headphones are not allowed in your ears, draped around your ears, and all the other possible ways to wear headphones.

4. Uniform

You must be in uniform before entering the room. You are expected to follow the school uniform policy in this class. If your shirt or pants are out of uniform (including hoodies), you will be sent to the admin offices to receive an appropriate uniform.

5. Bathroom/Water Fountain Policy

Students must ask permission to leave the classroom during the class period. Only one student will be allowed out of the classroom at a time. No students can use the bathroom during the first 10 minutes of class or last 10 minutes of class. You ALWAYS need a pass whenever you leave the classroom.

6. Homework, Quizzes and Exams

Homework will be assigned a couple times per week. Quizzes are given at least every other week. We will have final unit exams or projects.

Students can take missed quizzes with documentation for full credit and without documentation for up to 80% of the grade.

Consequences for not following these rules will be as follows:

- 1.) Verbal Warning
- 2.) One-on-one conversation
- 3.) Call home and/or sent to Courtney or admin office.

Grading Policy

Category	Examples	Grade Percentage
Learning Activities	Classwork, Homework, Reflections	40%
Formative Assessments	Quizzes, Inquiry/Problem Solving	30%

Summative Assessments	Exams, Projects	30%
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Final Grades

A+ 97-100	B+ 87-89	C+ 77-79	Fail 0-64
A 93-96	B 83-86	C 73-76	
A- 90-92	B- 80-82	C- 65-72	

Extra Help: We are here to help.

Tutoring will be available after school on Fridays in room 245 or by appointment.

Portfolio & Panel:

Sophomores will complete a portfolio by the end of the Fall semester.

Juniors will complete a panel by the end of the Fall semester.

Semester at a Glance

Semester Essential Question: How can we construct a convincing argument?

Unit 1: Basics of Geometry at FHS

Essential Question: How can we make mathematical discoveries?

Time Frame: September-October

Unit Final Exam: October 19

Standards	Learning Targets
<p><u>PBAT Rubric Skills:</u> Reasoning and Proof: I can justify my mathematical arguments logically.</p> <p>Problem Solving: I can select and analyze appropriate strategies to solve non-routine problems.</p> <p><u>CCSS:</u> <u>GEO-G.CO.1</u> Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance</p>	<p>M 1: I can describe my experiences with math and the impact they have had on me.</p> <p>M 2: I can differentiate between a growth and fixed mindset.</p> <p>T 1: I can investigate mathematical prompts through inquiry to prove conjectures.</p> <p>T 2: I can use logic and reasoning to find and explain a solution.</p> <p>T 3: I can select and analyze appropriate strategies to solve non-routine problems.</p>

<p>around a circular arc as these exist within a plane.</p> <p><u>GEO-G.GPE.6</u> Find the point on a directed line segment between two given points that partitions the segment in a given ratio.</p> <p><u>GEO-G.GPE.5</u> 5. On the coordinate plane: a. Explore the proof for the relationship between slopes of parallel and perpendicular lines; b. Determine if lines are parallel, perpendicular, or neither, based on their slopes; and c. Apply properties of parallel and perpendicular lines to solve geometric problems.</p> <p><u>GEO-G.CO.9</u> 9. Prove and apply theorems about lines and angles</p>	<p>C 1.1 I can define angle, perpendicular lines, parallel lines, and line segment.</p> <p>C 1.2 I can explain and use complementary and supplementary angle relationships.</p> <p>C 1.2 I can discover midpoint formula.</p> <p>C 1.3 I can find and justify the midpoint of a line segment.</p> <p>C 1.4 I can defend the relationship between slopes of parallel lines.</p> <p>C 1.5 I can defend the relationship between slopes of perpendicular lines.</p> <p>C 1.6 I can prove lines parallel or perpendicular based on their slopes.</p> <p>C 1.7a I can define corresponding and vertical angle relationships.</p> <p>C 1.7b I can define alternate interior and alternate exterior angle relationships.</p> <p>C 1.7c I can define same side interior and exterior angle relationships.</p> <p>C 1.8 I can prove lines parallel or based on angle relationships.</p> <p>C 1.9 I can justify my solutions using properties of parallel and perpendicular lines.</p>
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Unit 2: Right Triangles

Essential Question: *How can we use patterns to understand and explain our environment?*

Time Frame: October-November

Unit Final Exam: November 21

Standards	Learning Targets
<p><u>PBAT Rubric Skills:</u> Problem Solving: I can select and analyze appropriate strategies to solve non-routine problems.</p> <p>Communication: Always uses mathematical language and notations accurately.</p>	<p>T 2: I can select and analyze appropriate strategies to solve non-routine problems.</p> <p>T 2: I can use mathematical language and notations accurately.</p>

<p>Always clearly explains mathematical thinking in an organized and detailed way.</p> <p>CCSS: <u>GEO-G.SRT.6</u> Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of sine, cosine and tangent ratios for acute angles.</p> <p><u>GEO-G.SRT.7</u> Explain and use the relationship between the sine and cosine of complementary angles.</p> <p><u>GEO-G.SRT.8</u> Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems. ★</p> <p><u>GEO-G.CO.10</u> Prove and apply theorems about triangles.</p> <p><u>GEO-G.MG.3</u> Apply geometric methods to solve design problems.</p>	<p>T 3: I can clearly explain mathematical thinking in an organized and detailed way.</p> <p>C 2.1 I can prove pythagorean theorem.</p> <p>C 2.2 I can use pythagorean theorem to find missing side lengths.</p> <p>C 2.4 I can explain the relationship between side ratios and angle measures in a right triangle.</p> <p>C 2.5 I can use the sine ratio to describe right triangles.</p> <p>C 2.6 I can use the cosine ratio to describe right triangles.</p> <p>C 2.7 I can use the tangent ratio to describe right triangles.</p> <p>C 2.8 I can defend my solutions to design problems.</p>
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Unit 3: Triangles & Quadrilaterals

Essential Question: *How do we prove a conjecture?*

Time Frame: November-December

Unit Final Exam: December 20

Standards	Learning Targets
<p><u>PBAT Rubric Skills:</u> Reasoning and Proof: Makes valid conceptual/theoretical arguments and justifies them logically.</p> <p>Connection: Demonstrates an in-depth understanding of the relationships between mathematical concepts, procedures, and/or strategies.</p> <p>CCSS: <u>GEO-G.CO.10</u> Prove and apply theorems about triangles.</p>	<p>T 1: I can justify my mathematical arguments logically.</p> <p>T 2: I can demonstrate understanding relationships between mathematical concepts and procedures.</p> <p>T 3: I can demonstrate understanding relationships between mathematical concepts and strategies.</p> <p>C 3.1 I can prove and use interior angle sum theorem.</p>

<p><u>GEO-G.SRT.2</u> Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar. Explain using similarity transformations that similar triangles have equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.</p> <p><u>GEO-G.SRT.5</u> Use congruence and similarity criteria for triangles to: a. Solve problems algebraically and geometrically. b. Prove relationships in geometric figures.</p> <p><u>GEO-G.CO.11</u> Prove and apply theorems about parallelograms.</p> <p><u>GEO-G.GPE.7</u> Use coordinates to compute perimeters of polygons and areas of triangles and rectangles. ★</p>	<p>C 3.2a I can prove and apply theorems of parallelograms.</p> <p>C 3.2b I can prove and explain area of a parallelogram.</p> <p>C 3.3 I can prove distance formula.</p> <p>C 3.4 I can use distance formula to find perimeter of triangles and quadrilaterals.</p> <p>C 3.5 I can define congruence and similarity.</p> <p>C 3.6 I can determine triangle congruence by corresponding sides and angles.</p> <p>C 3.7 I can prove triangle congruence efficiently using congruence theorems.</p>
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Unit 4: Transformations

Essential Question: Is something the same after it's been transformed?

Time Frame: December-January

Unit Final Exam: January 29

Standards	Learning Targets
<p><u>PBAT Rubric Skills</u> Representation: Creates an accurate mathematical representation(s), inherent to the task, to solve problems or portray solutions.</p> <p>Communication: Always uses mathematical language and notations accurately.</p> <p><u>CCSS:</u> <u>GEO-G.CO.4</u> Develop definitions of rotations, reflections, and translations in terms of points, angles, circles, perpendicular lines, parallel lines, and line segments.</p> <p><u>GEO-G.CO.2</u></p>	<p>T 1: I can create accurate mathematical representations, fundamental to the task, to solve problems or portray solutions.</p> <p>T 3: I can use mathematical language and notations accurately.</p> <p>T 4: I can clearly explain mathematical thinking in an organized and detailed way.</p> <p>C 4.1 I can define congruence and similarity.</p> <p>C 4.2 I can justify whether two figures are congruent, similar, or neither.</p> <p>C 4.3a I can develop a definition of translation.</p> <p>C 4.3b I can translate a figure.</p>

Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not.

GEO-G.CO.6

Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure. Given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.

GEO-G.CO.3

Given a regular or irregular polygon, describe the rotations and reflections (symmetries) that map the polygon onto itself.

GEO-G.CO.5

Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure. Specify a sequence of transformations that will carry a given figure onto another.

GEO-G.SRT.1

Verify experimentally the properties of dilations given by a center and a scale factor. Coherence:
a. Verify experimentally that dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.
b. Verify experimentally that the dilation of a line segment is longer or shorter in the ratio given by the scale factor.

GEO-G.SRT.2

Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar. Explain using similarity transformations that similar triangles have equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.

C 4.4a I can develop a definition of reflection.

C 4.4b I can reflect a figure.

C 4.5a I can develop a definition of rotation.

C 4.5b I can rotate a figure.

C 4.6 I can perform composite transformations to create an image.

C 4.7 I can describe the rigid motion transformations that map a figure onto itself.

C 4.8a I can develop a definition of dilation.

C 4.8b I can dilate a figure by a given scale factor.

C 4.9 I can determine the scale factor of a dilated figure.