# Geometry

**Syllabus 2017-2018**

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**Check your grades:**

This is a two semester course in which students learn geometry properties and geometry proofs. Students also further develop their skills in algebra and are introduced to key concepts in the following areas: trigonometry; Pythagorean Theorem, quadrilateral properties etc.

You have all proven that you belong in this class based on hard work and passing your 9th grade math portfolio presentations. In this class you will need to study and do your homework. This course culminates in a math portfolio presentation in January and an in class portfolio assessment in June.

Prerequisite: completion of Algebra and portfolio presentations.

We want this class to be as successful as possible. To achieve this, we want everyone to work hard and be proud of the learning they are doing. You have the right to be respected by your teacher and classmates, but you must also show respect to others as well as to the learning process.

***Semester 1: Unit Names with Essential Questions:***

1. Pythagorean Theorem, distance and midpoint
    a. How do we use the Pythagorean Theorem and distance formula to find the length of sides of a triangle?
    b. How do we find the midpoint between two coordinate points?
2. Trigonometric Ratios
    a. How do we find the lengths of a right triangle given an angle and a side?
    b. How do we apply trigonometric ratios in word problems?
    c. How do we find angles of a right triangle using the sides?
3. Angles
    a. How do we find missing angles in a triangle?
    b. How do we find missing angles in a polygon?

c. How do we find angles created by a transversal cutting two parallel lines?

d. How do we construct bisector and perpendicular bisectors?

4. Transformations

    a. How do we transform images?

***<u>Semester One Major Project Assessment:</u>***

1. Angle City Project
2. Ramp Project
3. How Tall is the Building Project
4. Cartoon Character

***<u>Semester 2: Unit Names with Essential Questions:</u>***

1. Properties of polygons

    a. What are the properties of triangles?

    b. What are the properties of quadrilaterals?

    c. <u>Project:</u> School Project

2. Perimeter, Area, Surface area and volume

    a. How do we find the perimeter of 2D objects?

    b. How do we find the area of a 2D object?

    c. How do we find the volume of a 3D object?

    d. <u>Project:</u> Water Crisis Project

3. Coordinate geometry

    a. How do we prove triangles and quadrilaterals in a coordinate plane?

4. Circles

    a. How do we use the properties of a circle?

    b. How do we measure arcs and angles in a circle?

    c. <u>Project</u>: Circle Project

***<u>Semester Essential Questions:</u>***

1. How are the properties of angles used in the “real” world?
2. How are Math and Art Related?

3. What are angle relationships and how do I use them to solve for missing angles?
4. How do I use a compass to create geometric segments?
5. What is a proof and how do I perform formal and informal proofs?
6. How do I use algebra to help me find missing measurements in Geometry?
7. What happens when a plane intersects two parallel lines?
8. What is and how do I solve problems dealing with compound Loci?
9. How do I use a compass to construct and justify perpendicular and parallel lines?
10. How to I write and argue a formal proof?
11. What are the methods of proving triangles congruent?
12. How do I determine if lines are parallel or perpendicular?
13. What are the properties of triangles?
14. What properties do similar triangles have?

## ***Semester Essential Questions:***

1. How can problem solving help us examine and solve historical mathematical problems?
2. How are the various mathematical representations related (words, equations, graphs, tables, equations)?
3. How can we use the various mathematical representations to model problems?

## **Expectations as an FHS Student**

We have high expectations for our students. Your teachers, advisors and all staff members believe that you have the capacity to be successful academically and achieve your dreams. We also want you to understand that as an FHS is a safe learning community and we believe that all students can be upstanders and use their voices to create positive change for themselves, their loved ones and their communities. In order to maintain such a learning community, the following are some important expectations of you as a student:

- **NO PHYSICAL FIGHTING OR PLAY FIGHTING**: You have the right to feel safe in school. So do your peers. You also need to learn to solve problems and compromise respectfully without fighting. FHS is a professional learning community so even play fighting is not acceptable behavior as it does not demonstrate professionalism and can often lead to accidents or fights.

- **COME EVERY DAY IN FHS DRESS CODE**: FHS is a professional learning community and we expect you to dress for success! Your clothing demonstrates professionalism and will help prepare you for college and careers in the future.

- **COME TO SCHOOL EVERYDAY:** Your attendance is key to your academic success. You need to be present no only to learn the necessary material, but to be a part of the school community and to add to class and advisory discussions. You are expected to maintain at least a 90% attendance average in school. That means at most, you should only miss one out of every 10 days, or 4 days a cycle. You get out of school at 1:30 on Wednesdays, so all non-emergency appointments should be made during this time.

- **PRACTICE RESPECTFUL LANGUAGE AND BEHAVIOR:** FHS is a safe learning community. We value your unique, individual identity and want you to appreciate and value the identities of your community members. We are a bully-free zone, which means that you will respect all members of our community and will use positive and tolerant language within the school community, including Facebook and other online forums. You will not use language to make fun of or hurt another member of the community. This includes insults, cursing, racist, or homophobic remarks. Language is powerful. You need to be accountable for your words and understand the impact of your words on others. We believe that language should be used to build relationships and positive learning communities and not used for harm.

- **DO YOUR BEST AND BE AN ACTIVE PARTICIPANT IN YOUR EDUCATION:** Everyday that you walk through our school doors, you have made the choice to learn. You have made the choice to work towards your dreams. So when you are in school, you also need to choose to do your best in classes. We are here to help and support you. You are not expected to know everything in class, or to always know what the best choices are in a situation – you are here to learn those things. But we do expect that you are patient with yourself and others while you are learning, that you ask for and accept help when you need it, that you try and take risks, and that you contribute to classes in a positive, respectful manner.

- **CHOOSE TO BE AN UPSTANDER:** An upstander is someone who makes choices that help not only themselves, but better the lives of others. Upstanders do the right thing in moments of injustice. Upstanders choose to help others in need, speak up for people when they cannot speak up for themselves and speak up when they see something that is unfair. An upstander works to create positive change for themselves, their loved ones and their communities.

## Layered Curriculum

The purpose of this layered curriculum is to make you, the student, responsible for your own learning. Coming to class and simply completing "something" will no longer qualify for a passing grade. Much of what you will learn MUST be **orally defended**. In other words, you must be able to have a discussion with the teacher about what you learned. In addition, you are assessed on what you have learned everyday. It is your responsibility to get additional help what you need it. Tutoring days will be announced week 2 of classes. Please make sure you attend tutoring if you are not doing well on your daily quizzes. Remember it is not what you say you know, but how well you can show you know the content. Your grades are mostly based on how well you show you understand the material.

**C Layer**: This layer tests basic knowledge and understanding. You will have some choice in how you learn the material, but you need to demonstrate that you learn it before moving on. Some activities will be required, and others you will have choice in how you demonstrate your mastery.

**B Layer**: This layer requires you to take what you have learned in layer C and apply it using your skills like problem-solving or writing. This layer will require you to be mostly self-guided and independent.

**A Layer**: This layer requires you to apply what you learned in the previous two layers and apply it using analysis, evaluative and critical thinking skills. If you earned full points in the previous two layers and full points here, you will get an A as a final grade.

**FHS Common Grading Policy:**

- **Learning Activities (homework, classwork, participation):** at least 60-80 graded, entered assignments a semester
  - 60 learning activities = 3 graded, entered assignments a week/20 per progress report
  - 80 learning activities = 4 graded, entered assignments a week/approximately 26 per progress report
- **Formative Assessments:** at least 8-10 a semester
- **Summative Assessments:** at least 4-6 summative assessments a semester

Grades are given in report cards 2x a year along with a narrative about student skills, content knowledge and strengths and challenges. Twice a semester (4x a year), students also receive progress reports.

Below you will find the grade conversion from percentages to letter grades.

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| 7-100 | 7-89 | 7-79 | )-64 |
| -96 | -86 | -76 | |
| )-92 | )-82 | 5-72 | |

***Classroom Independence/Interdependence***

Please do not be late to class. Once in class your participation is required. If you are absent you must make up your missed work. Full class participation includes arriving on time and being ready to work. If you are not, then points may be deducted from your daily participation grade.

***Homework***

Students have homework every night. Students are expected to complete whatever work was not completed during the class period in preparation for the quiz the following day. In addition, if all classwork was completed, students should use the resources on pupilpath as a homework and preparation for their quiz the next day.

****Deadlines are strictly enforced.** We have a lot to do to prepare for the Math Panel. It is crucial to make sure you meet all deadlines. Failure to meet deadlines will result in ineligibility to present your Panel. It is your responsibility to setup an appointment to meet with your teacher for tutoring on your project.***

**Scope and Sequences - Essential Questions, Common Core:**

Semester Essential Questions: (1) How are the properties of angles used in the "real" world? How are Math and Art Related?

| 1. Dates | 2. Unit Name | 3. Mathematical Essential Questions | 4. Content I can statement | 5. Facing History Touch point and essential questions | 6. Common Core | 7. Daily and Weekly Assignments Scaffolded and Differentiated | 8. Major Assessment(s) |
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| Sept Sept/ Oct b | **UNIT 1:** Algebra Review, Introduction to Geometry: Lines, Angles, Measure | 1.Review Algebra<br><br>2. What are angle relationships and how do I use them to solve for missing angles?<br><br>3. How do I use a compass to create geometric segments? | ***Angles***<br>I can classify types of angles and relationships.<br>I can use equations to solve for missing angles.<br>I can identify and determine lines that are parallel and perependicular<br>I can identify relationships formed by parallel lines cut by a transversal.<br>I can solve for the missing angles using the transversal and triangle properties.<br>I can define different vocabulary terms | ***Overaching Question:*** Who do I care about? For whom am I responsible?<br><br>Relationships and similarities within triangles:<br><br>Why do some groups feel more responsible for | Geometric Relationships<br><br>Define trigonometric ratios and solve problems involving right triangles **CCSS.MATH.CONTENT.HSG.SRT.C.6**<br><br>Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading | Daily Assignments: *Classwork:* Review, Mini-Lesson, classwork/practice problems, problem sets, performance tasks, history of given performance tasks, journal<br><br>Weekly Assignments: Culminating performance task, quiz | Unit test Performance Tasks: Angle City Project: Students draw parallel horizontal lines on a large piece of paper and draw transversal lines at different angles. They will create a city map by constructing parallel lines |

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| er | ment,<br><br>**<u>UNIT 2:</u>**<br>Pythagorean Theorem, how do we use Pythagorean Theorem to prove a triangle is a right triangle | 4. How do I use algebra to help find missing measurements in Geometry?<br><br>5. How do we use Pythagorean Theorem to find the missing side of a right triangle?<br><br>6. How do we use Pythagorean theorem to prove a triangle is a right triangle | I can determine the relationship between the different parts of parallel lines cut by a transversal<br>I can close read and use problem solving skills to solve an angle contextual problems.<br>I use the triangle angle sum theorem to find the Triangle Measurement<br>I can determine the angle bisectors and perpendicular bisectors.<br>I can use algebra to find the degrees of angle bisectors and perpendicular bisectors<br>I can construct angle bisector<br>I can construct perpendicular bisector<br><br>***Pythagorean theorem***<br>I can identify the properties of a right triangle.<br>I can label the parts of a right triangle given theta.<br>I can find the missing leg using pythagorean theorem<br>I can find the missing hypotenuse using pythagorean theorem<br>I can find the converse of a right triangle<br>I can evaluate a contextual problem<br>I can relate pythagorean theorem to the real world<br><br>***Distance formula***<br><br>I can find the distance between two points<br>I can use the distance formula to find the missing length of a side and/or hypotenuse in a right triangle<br>I can apply the distance formula in a real world application<br><br>***Midpoint formula***<br>I can find the midpoint between two points | people who they identify (similar to) with versus group that are different?<br><br><u>Pythagorean Theorem:</u><br><br>Who responsibility is to help or provide aide after a natural disaster? | to definitions of trigonometric ratios for acute angles.<br><br>**CCSS.MATH.CONTENT.HSG.SRT.C.7**<br><br>Explain and use the relationship between the sine and cosine of complementary angles.<br><br>**CCSS.MATH.CONTENT.HSG.SRT.C.8**<br><br>Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.* | *Scaffolding in assignments:* Weekly packets, graphic organizers, sequence of objectives, groupings for group work, multiple solving methods taught, checklists<br>*Scaffolding in tasks*: Sequence within the task, writing process sequence, checklists<br>*Differentiation:* T.I.E.D. organizer, question prompts, variety in tasks to meet individual student needs and skill level, enrichment activities, tasks, and questions to explore, checklists | using their compass and then bring their city to life by placing landmarks on their map using the angle relations given. For example the school and bank must be in the position of alternate interior angles. They will create a key to help identify their angles and label the degree with the corresponding vocabulary. Finally they will measuring their angles to confirm that the relationships are correct and that the lines they drew are indeed parallel.<br><br><u>Performance Tasks:</u><br>Using famous landmarks with a right triangle students will find the 3 distances using the Pythagorean theorem (ex: they would find the distance between the top of the Empire State building and the tip of |

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| | | | I can use the midpoint formula to find the missing length of a side and/or hypotenuse in a right triangle<br>I can apply the midpoint formula in a real world application<br><br><u>Vocabulary Development:</u><br>*Hypotenuse, Adjacent, Opposite, Reference Angle Transversal, Vertical angles, Supplementary angles, Complementary angles, Interior angles, Exterior Angles, Different Kinds of Polygons (Quadrilateral, Pentagon, Hexagon, Heptagon, Octagon, Nonagon, Decagon),Alternate Exterior and Alternate Interior Angles, Corresponding Angles, proof, construction, parallel, Perpendicular, Midpoint, Distance, Line segment, Slope, Conjunction, Disjunction, Statement, Biconditional, Inverse, Converse, Contrapositive* | | | | Manhattan island). They would present their result in a TIED paragraph and on a poster. |

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| November/December | **UNIT 3:**<br><br>Pythagorean Theorem and Trigonometry | How do we use trigonometry to find the missing sides and angle in a right triangle?<br><br>How do we use the inverse trigonometry to find the missing angle of a right triangle?<br><br>What are the methods of proving triangles congruent?<br><br>How do I determine if lines are parallel or perpendicular?<br><br>What are the properties of a polygon? | ***Trigonometric Ratio***<br>**Finding the missing side of a missing Right Triangle given the reference angle:**<br>I can analyze and compare Ratios<br>I can label the parts of the right triangle and correctly setup the equation<br>I can close read, and use problem solving skills to apply trigonometry to the real world<br>I can use Sine, Cosine and Tangent correctly in the problem.<br>I can use inverse trigonometric functions to find the missing angle<br>I can determine the angle of depression and elevation<br>I can use trigonometry to find the angle or missing side given an angle of depression or elevation<br><br>**Finding the missing angle**<br>I can label the parts of the right triangle and correctly setting up the equation<br>I can determne which trigonometry function is correct to use<br><br><u>Vocabulary Development:</u><br>Sine, Cosine, Tangent, adjacent, hypotenuse, converse, proving, properties of a polygon | <u>Right Triangles and trigonometry:</u><br><br>Do we have a responsibility to protect other countries? Should we get involved in other countries well fair? | Apply trigonometry to general triangles<br>**CCSS.MATH.CONTENT.HSG.SRT.D.9**<br><br>(+) Derive the formula A = 1/2 ab sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.<br><br>**CCSS.MATH.CONTENT.HSG.SRT.D.10**<br><br>(+) Prove the Laws of Sines and Cosines and use them to solve problems.<br><br>**CCSS.MATH.CONTENT.HSG.SRT.D.11**<br><br>(+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., | <u>Daily Assignments:</u><br>*Classwork:* Review, Mini-Lesson, classwork/practice problems, problem sets, performance tasks, history of given performance tasks, journal<br><br><u>Weekly Assignments:</u><br>Culminating performance task, quiz<br><br>*Scaffolding in assignments:* Weekly packets, graphic organizers, sequence of objectives, groupings for group work, multiple solving methods taught, checklists<br>*Scaffolding in tasks*: Sequence within the task, writing process sequence, checklists<br>*Differentiation:* T.I.E.D. organizer, question prompts, variety in tasks to meet individual student needs and skill level, enrichment activities, tasks, and questions to explore, checklists | <u>Unit test Performance Tasks:</u><br><br><u>CSI Project</u>: Students will use trigonometry to solve riddles to help find SOHCAHTOA Joe? They will complete five riddles then substitute their findings to solve who the mathemagicians. |

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| | | | | | surveying problems, resultant forces).<br><br>Apply trigonometry to general triangles (challenge) | | |
| January | Portfolio Tracked Students:<br><br>Portfolio preparation, review and assessment<br><br>Review distance, midpoint, parallel and perpendicular lines to help with the coordinate geometry and proving unit.<br><br>Panel Tracked Students: | How do demonstrate my understanding of the Angles, Pythagorean theorem and trigonometry in my portfolio presentation? | ***After the portfolio we will be reviewing distance, midpoint, parallel and perpendicular lines again to help reinforce the next unit*** | Independence:<br>● Procedural Fluency<br>● Setting up problem<br>● Meeting deadlines<br>● Close reading<br><br>Interdependence:<br>● Group roles<br>● Group work<br>● Peer edit<br><br>Interpretation:<br>● Applying formulas to new situation<br>● Incorporating Teacher Feedback<br><br>Voice:<br>● Making an argument<br>● Expressing and justifying reason for choosing arguments | | Daily Assignments:<br>*Classwork:* Review, Mini-Lesson, classwork/practice problems, problem sets, performance tasks, history of given performance tasks, journal<br><br>Weekly Assignments: Culminating performance task, quiz<br><br>*Scaffolding in assignments:* Weekly packets, graphic organizers, sequence of objectives, groupings for group work, multiple solving methods taught, checklists<br>*Scaffolding in tasks*: Sequence within the task, writing process sequence, checklists<br>*Differentiation:* T.I.E.D. organizer, question prompts, variety in tasks to meet individual student needs | Unit Test:<br><br>Performance Task: Panel Project |

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| | | | | | | and skill level, enrichment activities, tasks, and questions to explore, checklists | |

If you have any questions we can be reached by phone at (212) 757-2680 or by email at

maria@facinghistoryschool.org and danielle@facinghistoryschool.org. If you can, please provide your email address below so that we can contact you via email. We look forward to a successful and rewarding semester.

Please return this portion to your teacher

Student Name: _____

Student Email Address: _____

Parent/Guardian Name: _____

Home Phone: _____

Cell Phone: _____

Parent/Guardian Email Address: _____

I have read the above contract and expectations and will do my best to follow the rules and be a successful student in this class.

Student Signature: _____

I have read the above contract and expectations and will do my best to help my child to follow the rules and be a successful student in this class.

Parent/Guardian Signature: _____