Franklin High School Geometry 1 -- 2019-2020

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Required Supplies: EVERY DAY bring a pencil and math notebook or binder.
Recommended supplies: Protractor, compass, colored pencils, 6 inch ruler, and highlighters.

Expectations: Attend class on-time everyday and bring the required supplies. Work with your table mates to complete all warm-ups, investigations, assignments and group tests.

- **Hall passes:** Success in studying math requires that you make good use of class time. Everyone is given TWO hall passes per semester. If they are not used they may be turned in for additional points on the final exam.

- **Daily warm-ups:** Warm-ups are kept in your math notebook with any notes presented in class. If you arrive in class on-time and attempt the warm-up in a timely manner, you will receive a stamp on the unit overview sheet.

- **Assignments**: Each class you will receive an assignment to practice the learning target covered that day. Most assignments will be broken up into sections containing C-level problems and B-level problems. The expectation is that any work not completed in class is completed as homework. At the start of each class, if you have completed the assignment through C-level problems and at least one B-level problem, you will receive a stamp on the unit overview sheet.

- **Unit overview sheet:** Before each unit you will receive a unit overview sheet. On this sheet you will keep track of stamps you receive for warm-ups and on-time homework. This is also your cheat sheet that can be used during the exam. During test corrections you may exchange 10 stamps for a second rough grade or have me point (no words) regarding where you should focus your attention in correcting one problem.

- **Exams:** The unit overview sheet will contain all test dates for that unit. Exams will be broken up between C-level, and A/B-level problems. During exams you may use your unit overview which will be turned in with the exam. The class will receive a limited amount of time to then make corrections. During those test corrections stamps can be exchanged as discussed above.

- **Retake exams:** Students can retake an exam during tutorial. There are no test correction opportunities on a retake exam and stamps cannot be redeemed on a retake exam. In order to retake a test the student must bring in the stamp sheet and/or all of the worksheets for that unit to establish that all C-level problems were completed and have a cheat sheet. The retake test grade can be no higher than 85%.

IF YOU MISS CLASS it is *your responsibility* to be prepared for the next class.
- Extra copies of notes, investigations and worksheets will be placed in the class notebook.
- A missed exam will render a 0% until the test has been made up.

GRADING POLICY:
- Your semester grade will broken 100% tests

- No extra credit will be given in this class.

This syllabus may change as necessary to meet the needs of the students throughout the semester.

Differentiation Strategies:
Students will be given open-ended questions on a daily basis; they will be able to determine the level of difficulty themselves. Whenever possible, students will be given options of two different tasks; they will have the choice of which will be more accessible for them.
Honors credit is available for students interested.
Copies of notes will be available to all students for each unit posted on my website as well.

Standards Covered
Please be aware that the standards below are very wide, and can be interpreted in many ways. The skills that will be assessed in each unit will be made clear on the Unit Stamp Sheets students receive at the beginning of each unit. These may also be found on my website as we reach each unit.

Unit 1: Constructions
Priority Standards:
HSG.CO.D.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line*.
Supporting Standards:
HSG.CO.D.13 Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.
HSG.GPE.A.2 Derive the equation of a parabola given a focus and directrix.
HSG.C.A.3 Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.

Unit 2: Transformations
Priority Standards:
HSG.CO.A.3 Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.
HSG.CO.A.4 Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
HSG.CO.B.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.
HSG.SRT.A.1 Verify experimentally the properties of dilations given by a center and a scale factor.
HSG.SRT.A.1.A A 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.
HSG.SRT.A.1.B The dilation of a line segment is longer or shorter in the ratio given by the scale factor._
Supporting Standards:
HSG.CO.A.2 Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
HSG.CO.A.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.

Unit 3: Lines and Angles
Priority Standards:
HSG.CO.A.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

HSG.CO.C.9 Prove theorems about lines and angles. *Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints*.

Unit 4: Congruence and Similarity

Priority Standards:

HSG.SRT.A.2 Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
HSG.SRT.A.3 Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
HSG.SRT.B.4 Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.*
HSG.SRT.B.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
HSG.CO.B.7 Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
HSG.CO.B.8 Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.

Supporting Standards:

HSG.SRT.A.1 Verify experimentally the properties of dilations given by a center and a scale factor.
HSG.SRT.A.1.A A 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.
HSG.SRT.A.1.B The dilation of a line segment is longer or shorter in the ratio given by the scale factor.
HSG.CO.C.10 Prove theorems about triangles. *Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point*.

Unit 5: Trigonometry

Priority Standards:

HSG.SRT.C.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
HSG.SRT.C.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.*

Supporting Standards:

HSG.SRT.C.7 Explain and use the relationship between the sine and cosine of complementary angles.

Unit 6: Coordinate Geometry

Priority Standards:

HSG.GPE.B.4 Use coordinates to prove simple geometric theorems algebraically. *For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).*
HSG.GPE.B.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).
HSG.GPE.B.6 Find the point on a directed line segment between two given points that partitions the segment in a given ratio
HSG.GPE.B.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*
HSG.CO.C.11 Prove theorems about parallelograms. *Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals*.

Unit 7: Circles

Priority Standards:

HSG.C.A.2 Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.*
HSG.C.B.5 Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.

HSG.CO.A.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
Supporting Standards:
HSG.C.A.1 Prove that all circles are similar.
HSG.GPE.A.1 Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.

Unit 8: Solids
Priority Standards:
HSG.MG.A.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).*
HSG.MG.A.2 Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).*
HSG.GMD.A.1 Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. *Use dissection arguments, Cavalieri's principle, and informal limit arguments*.
HSG.GMD.A.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*
HSG.GMD.B.4 Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.
Supporting Standards:
HSG.MG.A.3 Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).*

Unit 9: Probability
Priority Standards:
HSS.CP.A.1 Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").
HSS.CP.A.2 Understand that two events *A* and *B* are independent if the probability of *A* and *B* occurring together is the product of their probabilities, and use this characterization to determine if they are independent.
HSS.CP.A.3 Understand the conditional probability of *A* given *B* as *P*(*A* and *B*)/*P*(*B*), and interpret independence of *A* and *B* as saying that the conditional probability of *A* given *B* is the same as the probability of *A*, and the conditional probability of *B* given *A* is the same as the probability of *B*.
HSS.CP.A.4 Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. *For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.*
HSS.CP.A.5 Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. *For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.*
HSS.CP.B.6 Find the conditional probability of *A* given *B* as the fraction of *B*'s outcomes that also belong to *A*, and interpret the answer in terms of the model.
HSS.CP.B.7 Apply the Addition Rule, P(A or B) = P(A) + P(B) - P(A and B), and interpret the answer in terms of the model.
Supporting Standards:
HSS.MD.B.5.A Find the expected payoff for a game of chance. *For example, find the expected winnings from a state lottery ticket or a game at a fast-food restaurant.*
HSS.MD.B.5.B Evaluate and compare strategies on the basis of expected values. *For example, compare a high-deductible versus a low-deductible automobile insurance policy using various, but reasonable, chances of having a minor or a major accident.*