Geometry ½ Course Syllabus

Franklin High School	**2019-2020**
Course Title: Geometry 1/2	**Grade Level(s):** 9th, 10th, 11th, 12th

Prerequisites:
Completion of Algebra ½

Course description:

During this course, students will learn about the following topics:

1. Constructions
2. Transformations
3. Lines and angles
4. Congruence and similarity
5. Trigonometry
6. Coordinate geometry
7. Circles
8. Solids
9. Probability

Emphasis will be place on specific topics as they are considered more essential for further studies in mathematics. Transformations, Lines and Angles, Trigonometry, Coordinate Geometry, Circles, and Probability are all topics that will have stronger emphasis during this class.

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.)

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.

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.

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.

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.

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.*

HSG.GPE.B.4 Use coordinates to prove simple geometric theorems algebraically.

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.

HSG.C.A.2 Identify and describe relationships among inscribed angles, radii, and chords.

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.

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.

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.

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.

HSS.CP.A.5 Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.

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.

Schedule of topics/units covered:

1. Constructions
2. Transformations
3. Lines and angles
4. Congruence and similarity
5. Trigonometry
6. Coordinate geometry
7. Circles
8. Solids
9. Probability

Differentiation/accessibility strategies and supports (TAG, ELL, SpEd, other):

Leveled, standards-based assessments with clear benchmarks for C-, B- and A-level work. Flexible timeline for demonstrating proficiency. Multiple attempts to retake and/or revise assessments. Clearly posted agenda, daily learning target(s) and content vocabulary. Students will have practice problems that are leveled as well and provide opportunities for extensions in each learning target area.

Class time is time for feedback, group work, investigations, and demonstrating understanding. During this time the habits of interaction that will be encouraged and modeled include:
-Time to think independently before working collaboratively
-Time to explain your reasoning
-Demonstrating how to listen to understand in groups
-Exploring multiple pathways to solve problems
-Time to explore and compare logic in our ideas and thinking
-Time to critique and debate mathematically

Assessment (pre/post)/evaluation/grading policy:

Grades will be based the student's demonstration of understanding of the standards.

Standard Grading Scale:
90-100% - A
80-89% - B
70-79% - C
60-69% - D
59- below - F

Grades will be weighted as follows:
Tests (summative assessments): 99%
Quizzes (formative assessments): 1%

Formative assessments are given daily in the form of daily quizzes. I will grade them and return them for review the following class period. They are 1% of the overall grade and used to provide students with feedback. This process helps students understand the grading practices that will be used on the unit tests and final. Daily quizzes are collaborative and open note.

Individual Tests are not open note tests. Students may use a student-created notecard when instructed for a test. Students will at times use a toolkit during a test. They are 99% of the overall grade.

Behavioral expectations:

Students will follow the norms as outlined by the class. These norms are in their notebook and posted on the wall

in the classroom. We have established and agreed that phones are off and away, students respect each other and the classroom, and that they are attentive to their work and learning.

Our classroom routine is designed to provide opportunities for students to move and talk while accessing the content. Each day an agenda is posted with time to get feedback, discuss new concepts, and practice what has been learned.

Students are expected to be in class on time and participate in all activities. In general, a student who follows the Franklin STRONG acronym as posted in the room, will be demonstrating great behavior.

Students and teachers will refer to the Franklin High School Student Climate Guide when addressing issues that arise.

Safety issues and requirements:

Students and teachers will refer to the Franklin High School Student Climate Guide when dealing with safety issues.