

Honors Geometry

2021-2022

Jefferson Middle School Syllabus

Major Assignments:

Tests and Quizzes: Tests and Quizzes will be given throughout and at the end of units of study.

Homework: Homework is a critical part of the course and will be assigned regularly. Grades are based on completion or random selection.

Topics:

Tools of Geometry
Reasoning and Proof
Parallel & Perpendicular Lines
Congruent Triangles
Triangle Relationships
Locus & Constructions

Polygons & Quadrilaterals
Similarity
Right Triangles & Trigonometry
Transformations
Area, Surface Area, & Volume
Circles

Field Trips: None

How can parents access instructional materials?

Course content, instructional materials, and all relevant mathematical resources can be found via the Jefferson Middle School Website (jms.ortn.edu). The course structure, content, lesson videos, and assignments can be located by clicking on the “Canvas” icon.

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Term 1

Note: In order to give students more experience with circle standards, please embed in earlier units as you see fit.

Intro to Geometry (Ch.1)	G.CO.A.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, plane, distance along a line, and distance around a circular arc.
	G.CO.C.9 Prove theorems about lines and angles.
Basic Concepts and Proofs (Ch. 2)	G.CO.A.4 Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
	G.CO.C.9 Prove theorems about lines and angles.

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Term 1

Congruent Triangles (Ch. 3)

G.CO.A.4 Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.

G.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 determine informally if they are congruent.

G.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.

G.CO.B.8 Explain how the criteria for triangle congruence (ASA, SAS, AAS, and SSS) follow from the definition of congruence in terms of rigid motions.

Lines in the Plane (Ch. 4)

G.CO.C.9 Prove theorems about lines and angles.

G.GPE.B.4 Find the point on a directed line segment between two given points that partitions the segment in a given ratio.

G.GPE.B.5 Know and use coordinates to compute perimeters of polygons and areas of triangles and rectangles. ★

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Term 2

Parallel Lines and Related Figures (Ch. 5)	G.CO.C.9 Prove theorems about lines and angles.
	G.CO.C.11 Prove theorems about parallelograms.
Polygons (Ch. 7)	G.CO.B.8 Explain how the criteria for triangle congruence (ASA, SAS, AAS, and SSS) follow from the definition of congruence in terms of rigid motions.
Similar Polygons (Ch. 8)	G.SRT.A.1 Verify informally the properties of dilations given by a center and a scale factor.
	G.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.
	G.SRT.A.3 Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
	G.SRT.B.4 Prove theorems about similar triangles.
	G.SRT.B.5 Use congruence and similarity criteria for triangles to solve problems and to justify relationships in geometric figures.
	G.CO.C.10 Prove theorems about triangles.
	G.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.).

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Term 3

The Pythagorean Theorem (Ch. 9)	G.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.
	G.SRT.C.7 Explain and use the relationship between the sine and cosine of complementary angles.
	G.SRT.C.8 Solve triangles. ★ a. Know and use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. b. Know and use the Law of Sines and Law of Cosines to solve problems in real life situations. Recognize when it is appropriate to use each.
Circles (Ch. 10)	G.C.A.1 Recognize that all circles are similar.
	G.C.A.2 Identify and describe relationships among inscribed angles, radii, and chords.
	G.C.A.3 Construct the incenter and circumcenter of a triangle and use their properties to solve problems in context.
	G.C.B.4 Know the formula and find the area of a sector of a circle in a real-world context.
	G.GPE.A.1 Know and write the equation of a circle of given center and radius using the Pythagorean Theorem.
	G.CO.A.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, plane, distance along a line, and distance around a circular arc.
Modeling with Geometry	G.MG.A.1 Use geometric shapes, their measures, and their properties to describe objects. ★
	G.MG.A.2 Apply geometric methods to solve real world problems. ★

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Term 4

Lines and Planes in Space (Ch. 6)

Prerequisites for 3-D studies.

Area (Ch. 11 selected sections)

G.GMD.A.1 Give an informal argument for the formulas for the circumference of a circle and the volume and surface area of a cylinder, cone, prism, and pyramid.

Surface Area and Volume (Ch. 12 selected sections)

G.GMD.A.2 Know and use volume and surface area formulas for cylinders, cones, prisms, pyramids, and spheres to solve problems. ★

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Year Long

The following standards are embedded in the curriculum throughout the year.

Embedded Standards

G.CO.A.2 Represent transformations in the plane in multiple ways, including technology. Describe transformations as functions that take points in the plane (pre-image) as inputs and give other points (image) as outputs. Compare transformations that preserve distance and angle measure to those that do not (e.g., translation versus horizontal stretch).

G.CO.A.3 Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry the shape onto itself.

G.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 determine informally if they are congruent.

G.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.

G.GPE.B.2 Use coordinates to prove simple geometric theorems algebraically.

G.GPE.B.3 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems.