

RSU 26 Curriculum Map

Content Area: MATH

Course: GEOMETRY

Grade Level: HS

Priority Standards for Course:

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.
2. 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.
3. Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180 degrees; 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.
4. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
5. 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.
6. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
7. Identify the shapes of two-dimensional cross-sections of three-dimensional ob

Primary Instructional Resource: Glencoe Geometry

Higher Order Thinking Skills: Apply, analyze, and evaluate

Dispositions:

Make sense of problems and persevere in solving them.

Reason abstractly and quantitatively.

Model with mathematics.

Construct viable arguments and critique the reasoning of others.

Use appropriate tools strategically.

Attend to precision.

Look for and make use of structure.

Look for and express regularity in repeated reasoning.

Technology Skills:

Students use scientific calculators.

Teachers support students' organization through the use of Google.

Cultural Inclusiveness and Representation: Knowing our students each year helps to incorporate opportunities to represent cultural identities and bring diversity to our math curriculum. Through utilizing different modalities of learning and hands-on challenges presented in each unit, students will have windows and mirrors that reflect and honor the evolving diversity of our classrooms.

Unit of Instruction: Tools of Geometry

Essential Questions:

- Why are constructions important to the study of geometry?
- How can equations be used to represent the relationships between points on a plane?
- What characteristics of special angle pairs make them easily identifiable in the world around us?

Anticipated Time Frame: 4-5 weeks

Content Concepts and Skills
I can name and identify points, congruent points, collinear points, coplanar points, lines, segments, congruent segments, rays, opposite rays, planes, angle bisectors, angles, congruent angles, supplementary angles, complementary angles, straight angles, adjacent angles, vertical angles, and linear pairs.
I can calculate the lengths and midpoints of segments using coordinate geometry.
I can use my understanding of angle and segment relationships to create and solve equations.
I can name and classify polygons according to their number of sides, convex or concave, and regular or irregular.

Unit of Instruction: Logical Arguments

Essential Question:

- How is understanding the different types of logic helpful in our study of geometry?

Anticipated Time Frame: 3 weeks

Content Concepts and Skills
I can use inductive reasoning to make conjectures, as well as use counter examples to prove conjectures false.
I can write compound statements, negate statements, and find their truth value.
I can write and identify conditional statements in if-then form, related conditionals, and identify the hypothesis and conclusion.
I can determine whether a conclusion is valid using deductive reasoning.

Unit of Instruction: Line Relationships

Essential Questions:

- Why do transversals intersecting parallel lines create special angle relationships?
- How can we use our knowledge of perpendicular lines to assist us in finding the distance between a point and a line?

Anticipated Time Frame: 4-5 weeks

Content Concepts and Skills
I can find the slope of a line given two points.
I can compare the slopes of lines and identify whether the lines are parallel, perpendicular, or neither.
I can name and identify angle pair relationships, including alternate exterior, alternate interior, corresponding, and

consecutive interior angles.

I can use my understanding of angle relationships formed by two parallel lines and a transversal to create and solve equations.

I can use the equations of lines to identify the slope and y-intercept of the line.

I can write the equation of a line that satisfies certain given conditions.

I can use the distance formula to calculate the distance a point is from a line.

Unit of Instruction: Triangles and Congruence

Essential Questions:

- What is necessary to determine the least amount of information needed to prove two shapes are congruent?
- How is it beneficial to identify unique triangles (isosceles, equilateral) and understand the common features that they share?

Anticipated Time Frame: 4-5 weeks

Content Concepts and Skills
I can classify triangles by their sides and angles.
I can use my understanding of angle relationships within triangles to create and solve equations.
I can write and demonstrate an understanding of congruence statements.
I can use my understanding of congruence statements for triangles to create and solve equations.

I can name and identify angle-side relationships that can be used to prove triangle congruence, including SSS, SAS, ASA, and AAS.

I can name and identify transformations on a coordinate plane, to include rotations, reflections, and translations.

I can use mapping to name and identify the preimage, image, as well as corresponding parts.

Unit of Instruction: Relationships in Triangles

Essential Question:

- How are points of concurrency significant to triangles?

Anticipated Time Frame: 4-5 weeks

Content Concepts and Skills
I can name and identify points of concurrency, including incenter, circumcenter, centroid, and orthocenter.
I can name and identify special segments in triangles, including angle bisectors, perpendicular bisectors, medians, and altitudes.
I can use my understanding of the relationships created by special segments and their points of concurrency to create and solve equations.
I can use my understanding of how angles between triangles and within a triangle relate to compare those angles.
I can use my understanding of how the measures of the sides of a triangle relate to one another to determine the range of possible values of one side given the other two.
I can use my understanding of the relationship between the measure of an angle of a triangle and the measure of the side across from that angle to compare different angles and sides of the triangle.

Unit of Instruction: Quadrilaterals

Essential Questions:

- How is the number of sides of a polygon related to the sum of all its interior angles?
- How and why are squares, rectangles, and rhombi similar? How and why are they different?

Anticipated Time Frame: 4 weeks

Content Concepts and Skills
I can calculate the total number of degrees for all interior angles of any polygon.
I can determine the angle measure for each interior angle of any regular or equiangular polygon.
I can determine the number of sides for any regular polygon if I am provided with the size of one angle.
I can describe the defining features of parallelograms, rectangles, rhombuses, squares, kites, and trapezoids.
I can list and apply the properties of a parallelogram, rectangle, rhombus, square, kite, and trapezoid.
I can determine whether a given quadrilateral is a parallelogram, rectangle, rhombus, square, kite, and/or trapezoid.

Unit of Instruction: Similarity

Essential Questions:

- What are real world examples of when understanding the scale factor of similar polygons is important?
- What does it mean for triangles to be similar?

Anticipated Time Frame: 3 weeks

Content Concepts and Skills
I can identify similar triangles and their scale factor. I can use my knowledge of scale factors to solve for the lengths of the sides of similar triangles. I can identify similar triangles using SSS and SAS.

Unit of Instruction: Right Triangles and Trigonometry

Essential Questions:

- How can we use our knowledge of parallel lines and transversals when studying the relationship between angles of depression and angles of elevation?
- What constitutes a special right triangle and what is important about them?
- What makes the pythagorean theorem important when classifying triangles?

Anticipated Time Frame: 4 weeks

Content Concepts and Skills
I can use the Pythagorean Theorem to solve for side lengths of right triangles. I can use Pythagorean Theorem and Inequalities to classify triangles as acute, right, or obtuse. I can use shortcuts to calculate side lengths of 45-45 and 30-60 right triangles. I can use sine, cosine, and tangent to calculate side lengths and angle measures of right triangles.