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## Options EHS Geometry A - OR

## Unit Lesson

## Foundations of Geometry

Euclidean Geometry
Identify and name undefined terms of point, line, plane, and distance along a line.
Analyze descriptions and diagrams that illustrate basic postulates about points, lines, and planes.
Defining Terms

\[\)|  Use undefined terms to precisely define parallel lines, perpendicular lines, ray, angle, arc, circle, and line segment.  |
| :--- |
|  Identify and name a pair of parallel lines, a pair of perpendicular lines, a ray, an angle, an arc, a circle, and a line  |
|  segment.  |

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Measuring Length and Angles
Identify a midpoint or bisector of a line segment or angles.
Apply the ruler postulate and segment addition postulate to calculate the lengths of line segments.
Apply the protractor postulate and angle addition postulate to calculate angle measures.
Introduction to Proof
Complete the steps to prove algebraic and geometric statements.
Identify proof formats, the essential parts of a proof, and the assumptions that can be made from a given drawing.
Linear Pairs and Vertical
Angles

## Scope and Sequence

Objectives

Identify and name a pair of parallel lines, a pair of perpendicular lines, a ray, an angle, an arc, a circle, and a line segment.

Identify a midpoint or bisector of a line segment or angles.

Apply the protractor postulate and angle addition postulate to calculate angle measures.

Complete the steps to prove algebraic and geometric statements.
Identify proof formats, the essential parts of a proof, and the assumptions that can be made from a given drawing.

Calculate angle measures by using definitions and theorems about linear pairs and vertical angles.

Identify complementary angles and supplementary angles from given diagrams.

## Scope and Sequence

Unit Lesson
Objectives
Solve problems involving measures of complementary and supplementary angles.
Complete the steps to prove statements using complementary angles and supplementary angles.
Performance Task:
Constructions
Unit Test

## Geometric Transformations

Introduction to Transformations
Determine if a transformation is isometric and identify corresponding parts of the pre-image and image.
Identify the type of transformation given a pre-image and an image.
Translations
Develop the definition of a translation using constructions.
Write the rule that describes a given translation.
Determine the image or pre-image of a figure after a given translation.
Reflections
Develop the definition of a reflection using constructions.
Describe the properties of and write rules for reflections.
Determine the image or pre-image of a figure after a given reflection.
Rotations
Develop the definition of a rotation using constructions.
Describe the properties of and write rules for rotations.
Determine the image or pre-image of a figure after a given rotation.

## Compositions

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## Scope and Sequence

## Objectives

Determine the image of a figure after a given composition of transformations.

| Symmetry |  |
| :---: | :---: |
|  | Identify reflectional symmetry in geometric figures and the number of lines of symmetry. |
|  | Identify rotational symmetry and its order in geometric figures. |
| Test |  |
| Angles, Lines, and Triangles |  |
| Slope |  |
|  | Identify linear functions by a constant rate of change |
|  | Interpret slope as an average rate of change |
|  | Determine slope of a line between two points |
|  | Identify increasing and decreasing linear functions using slope |
| Parallel and Perpendicular Lines |  |
|  | Construct parallel and perpendicular lines. |
|  | Identify parallel, perpendicular, and skew lines from three-dimensional figures. |
|  | Solve problems involving the distance from a point on the perpendicular bisector to both endpoints of the line segment. |
| Slopes of Parallel and Perpendicular Lines |  |
|  | Complete the steps to prove the slope criteria for parallel and perpendicular lines using coordinate geometry. |
|  | Determine if two lines are parallel or perpendicular. |
|  | Use slope criteria to find additional points on a line parallel or perpendicular to a given line. |
|  | Prove the slope criteria for perpendicular lines. |
| Lines Cut by a Transversal |  |

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## Scope and Sequence

## Objectives

Solve for angle measures when parallel lines are cut by a transversal.
Complete the steps to prove angle relationships given parallel lines cut by a transversal.
Proving Lines Parallel
Apply theorems to determine if lines are parallel.
Prove lines are parallel given angle relationships.
Writing Linear Equations
Write the equation of a line parallel to a given line that goes through a particular point.
Write the equation of a line perpendicular to a given line or segment that goes through a particular point.
Triangle Angle Theorems
Complete the steps to prove that the sum of the measures of the interior angles of a triangle is 180 degrees.
Identify and relate the interior and exterior angles of a triangle.
Calculate the measures of interior and exterior angles of a triangle.
Triangles and Their Side Lengths

Construct or justify the construction of isosceles and equilateral triangles.
Analyze the relationships between the angles of acute, right, and obtuse triangles.
Determine if three given segments will satisfy the triangle inequality.
Determine the length or parameters for a third side of a triangle given the other two sides.
Triangle Inequalities
Identify angle and side relationships in a triangle
Identify angle and side relationships between two triangles.
Solve real world problems involving relationships between angle measures and side lengths of one or two triangles.

## Isosceles Triangles

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## Scope and Sequence

Objectives
Complete the steps to prove the isosceles triangle theorem and its converse.
Identify characteristics of an isosceles triangle.
Solve for unknown measures of isosceles triangles.

## Unit Test

## Triangle Congruence and Similarity

Congruent Figures
Write congruency statements for transformed figures.
Determine if figures are congruent and, if so, identify their corresponding parts.
Determine unknown measures of congruent figures.
Triangle Congruence: SAS
Determine the isometric transformations that would map one triangle onto another triangle given that two corresponding sides and the included angle are congruent.

Identify the sides and angle that can be used to prove triangle congruency using SAS.
Complete the steps to prove triangles are congruent using SAS.
Triangle Congruence: ASA and AAS

Identify the side and angles that can be used to prove triangle congruency using ASA or AAS.
Complete the steps to prove triangles are congruent using ASA or AAS.
Determine the isometric transformations that would map one triangle onto another triangle given that two pairs of corresponding angles and one pair of corresponding sides are congruent.

Triangle Congruence: SSS and HL

Identify the parts that can be used to prove triangle congruency using SSS or HL.
Complete the steps to prove triangles are congruent using SSS or HL.

## Scope and Sequence

Unit Lesson
Objectives
Determine the isometric transformations that would map one triangle onto another triangle given that three corresponding sides are congruent.
Using Triangle Congruence
Theorems

Dilations

Similar Figures

Triangle Similarity: AA
Identify the composition of similarity transformations in a mapping of two triangles.
Complete the steps to prove triangles are similar using the AA similarity theorem.
Triangle Similarity: SSS and SAS

Identify the sides and angle that can be used to prove triangle similarity using SSS similarity theorem and SAS similarity theorem.

Complete the steps to prove triangles are similar using SAS similarity theorem.
Complete the steps to prove triangles are similar using SSS similarity theorem.

## Unit Test

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Unit Lesson

## Scope and Sequence

## Applications of Probability

Introduction to Probability
Interpret probability as the long-run relative frequency of an event.
Describe the law of large numbers.
Describe how a simulation is used to imitate a random process
Conduct a simulation using a graphing calculator.
Sets and Venn Diagrams
Identify and represent elements of sets and subsets, including the empty and universal sets.
Represent and interpret the union and intersection of sets using set notation and Venn diagrams.
Finding Outcomes
Identify possible outcomes for an event.
Evaluate expressions involving factorials.
Solve combination problems including finding a subset of the total number of possible combinations.
Solve permutation problems including finding a subset of the total number of possible permutations.
Theoretical and Experimental Probability

Independent and Mutually
Exclusive Events
Objectives

| Introduction to Probability |  |
| :---: | :---: |
|  | Interpret probability as the long-run relative frequency of an event. |
|  | Describe the law of large numbers. |
|  | Describe how a simulation is used to imitate a random process. |
|  | Conduct a simulation using a graphing calculator. |
| Sets and Venn Diagrams |  |
|  | Identify and represent elements of sets and subsets, including the empty and universal sets. |
|  | Represent and interpret the union and intersection of sets using set notation and Venn diagrams. |
| Finding Outcomes |  |
|  | Identify possible outcomes for an event. |
|  | Evaluate expressions involving factorials. |
|  | Solve combination problems including finding a subset of the total number of possible combinations. |
|  | Solve permutation problems including finding a subset of the total number of possible permutations. |
| Theoretical and Experimental Probability |  |
|  | Identify the sample space of an experiment and the complement of an event. |
|  | Calculate theoretical and experimental probability. |
| Independent and Mutually Exclusive Events |  |
|  | Identify mutually exclusive and independent events. |
|  | Calculate probabilities using the addition rule. |
|  | Calculate probabilities using the multiplication rule of independent events. |

Unit Lesson
Conditional Probability

Probability of Independent Events

## Scope and Sequence

## Objectives

Use calculations to determine if two events are independent.
Calculate conditional probabilities using formulas and Venn diagrams.
Calculate probabilities of compound events.

Determine if compound events are independent or dependent.
Calculate probabilities using tree diagrams or the multiplication rule of independent events
Probability and Two-Way Tables

## Construct a two-way table.

Use a two-way table to determine if two events are independent.
Compute conditional probabilities from data displayed in a two-way table.

Performance Task: Applying
Probability Concepts
Test

## Cumulative Exam

Cumulative Exam Review
Cumulative Exam


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