

## Teaching Unit: **Prerequisite Skills**

### Essential Understandings

Geometry, like many tasks in life, requires a certain set of prerequisite knowledge/skills.

## Sub Topic:

### Knowledge and Skills

Graph Ordered Pairs  
Perform Basic Operations involving both Positive and Negative Integers  
Evaluate Algebraic Expressions  
Solve Linear Equations with one Variable

## Teaching Unit: **Tools of Geometry**

### Essential Understandings

Understandings: Being able to see the geometrical characteristics of real world objects allows us to find information and justify statements about those objects.

## Sub Topic:

### Knowledge and Skills

Identify and model points, lines, and planes.  
Identify collinear and coplanar points and intersecting lines and planes in space.  
Measure segments and determine accuracy of measurement.  
Compute with measures.  
Find the distance between two points.  
Find the midpoint of a segment.  
Measure and classify angles.  
Identify and use congruent angles and bisector of an angle.  
Identify and use special pairs of angles.  
Identify perpendicular lines.  
Identify and name polygons.  
Find perimeter or circumference and area of two dimensional figures.  
Identify three-dimensional figures.  
Find surface area and volume of three-dimensional figures.

## Teaching Unit: **Introductions to Proofs**

### Essential Understandings

Problem solving requires both the ability to observe relationships and the ability to explore/communicate the reasons behind those relationships.

## Sub Topic:

### Knowledge and Skills

Identify and use basic postulates about points, lines, and planes.  
Use algebra to write two-column proofs.  
Use properties of equality in geometry proofs.  
Write proofs involving segments addition.  
Write proofs involving segment congruence.  
Write proofs involving supplementary and complementary angles.  
Write proofs involving congruent and right angles.

Teaching Unit: ***Parallels, Perpendiculars, and Transversals***

Essential Understandings

Known characteristics of a system of geometrical figures can be used to find/prove unknown characteristics.

Sub Topic:

Knowledge and Skills

Identify the relationships between two lines or two planes. (Know the difference between parallel and skew.)

Use the properties of parallel lines to determine congruent angles.

Use algebra to find angle measures.

Find the slopes of lines.

Use slope to identify parallel and perpendicular lines.

Recognize angle conditions that occur with parallel lines and a transversal.

Prove that two lines are parallel based on given angle relationships.

Know that the distance from a point to a line is measure along a segment perpendicular to the given line.

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Teaching Unit: ***Triangles and Congruency***

Essential Understandings

The congruency of some geometrical objects(triangles) can be proven with a minimal amount of information.

Sub Topic:

Knowledge and Skills

Identify and classify triangles by angles.

Identify and classify triangles by sides.

Apply the Angle Sum Theorem.

Apply the Exterior Angle Theorem

Name and label corresponding parts of congruent triangles.

Identify congruence transformations.

Use the SSS, SAS, ASA, AAS postulates to test for/proove triangle congruence.

Use the properties of Isosceles triangles.

Use the properties of Equilateral triangles.

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Teaching Unit: ***Quadrilaterals***

Essential Understandings

Once we can accurately classify a geometrical object, we immediately know a host of information about that object.

Sub Topic:

Knowledge and Skills

Find the sum of the measures of the interior angles of a polygon.  
Find the sum of the measures of the exterior angles of a polygon.  
Recognize and apply properties of the sides and angles of parallelograms.  
Recognize and apply properties of diagonals of parallelograms  
Recognize the conditions that ensure a quadrilateral is a parallelogram.  
Recognize and apply properties of rectangles.  
Determine whether parallelograms are rectangles.  
Recognize and apply the properties of rhombi.  
Recognize and apply the properties of squares.  
Recognize and apply the properties of trapezoids.  
Solve problems involving the medians of trapezoids.  
Classify Quadrilaterals as Parallelogram, Rectangles, Kite, Rhombi, Square, Trapezoid, and Isosceles Trapezoid and graphically represent the Hierarchical relationships among the same.

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Teaching Unit: ***Proportion and Similarity***

Essential Understandings

Using proportional objects such as scale models, diagrams and maps allows me to calculate information without making direct measurements.

Sub Topic:

Knowledge and Skills

Write ratios  
Use properties of proportions.  
Identify similar figures.  
Solve problems involving scale factors.  
Identify similar triangles  
Use similar triangles to solve problems.  
Use proportional parts of triangles.  
Divide a segment into proportional parts.  
Recognize and use proportional relationships of corresponding perimeters of similar triangles.  
Recognize and use proportional relationships of corresponding angle bisectors, altitudes, and medians of similar triangles.

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Teaching Unit: **Circles**

Essential Understandings

Circles are unique shapes in which the angles, arcs, and segments intersecting that circle have special relationships. These relationships can be used to find information and justify statements.

Sub Topic:

Knowledge and Skills

Identify and use parts of circles.  
Solve problems involving the circumference of a circle.  
Recognize and use relationships between chords and diameters.  
Find measures of inscribed angles.  
Find measures of angles of inscribed polygons.  
Use properties of tangents.  
Solve problems involving circumscribed polygons.  
Find measure of angles formed by lines intersecting on or inside a circle.  
Find measure of angles formed by lines intersecting outside the circle.  
Find measures of segments that intersect in the interior of a circle.  
Find measures of segments that intersect in the exterior of a circle.

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Teaching Unit: **Areas**

Essential Understandings

The area of any geometrical object is related to various linear measurements.

Sub Topic:

Knowledge and Skills

Find perimeters and areas of parallelograms.  
Determine whether points on a coordinate plane define a parallelogram.  
Find areas of triangles.  
Find areas of trapezoids and rhombi.  
Find areas of regular polygons.  
Find areas of circles.  
Find areas of composite figures.  
Solve problems involving geometric probability.  
Solve problems involving sectors and segments of circles.

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Teaching Unit: **Surface Area**

Essential Understandings

Even more complicated tasks/ideas are simply a succession/combination of simpler ones.

Sub Topic:

Knowledge and Skills

Draw isometric views of three-dimensional figures.  
Investigate cross sections of three-dimensional figures.  
Find lateral and surface areas of prisms.  
Find lateral and surface areas of cylinders.  
Find lateral and surface areas of pyramids.  
Find lateral and surface areas of cones.  
Recognize and define basic properties of spheres.  
Find surface areas of spheres.

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Teaching Unit: ***Volume***

Essential Understandings

Like area, volume is related to a variety of linear measurements; as those measurements change so does volume.

Sub Topic:

Knowledge and Skills

Find volumes of prisms.

Find volumes of cylinders.

Find volumes of pyramids.

Find volumes of cones.

Find volumes of spheres.

Solve problems involving volumes of spheres.

Identify congruent or similar solids.

State properties of similar solids.

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