

## Ohio High School Geometry Curriculum Mapping

Geometry and Spatial Sense Standard	Boardworks High School Geometry presentation
<b>Grade Nine</b>	
<b>Characteristics and Properties</b>	
1. Define the basic trigonometric ratios in right triangles: sine, cosine and tangent.	The sine ratio The cosine ratio The tangent ratio Trigonometry summary Right triangles
2. Apply proportions and right triangle trigonometric ratios to solve problems involving missing lengths and angle measures in similar figures.	Applying trigonometry
<b>Visualization and Geometric Models</b>	
3. Analyze two-dimensional figures in a coordinate plane; e.g., use slope and distance formulas to show that a quadrilateral is a parallelogram.	The distance between two points The equation of a circle The midpoint of a line segment Using circle properties Slopes and intercepts
<b>Grade Ten</b>	
<b>Characteristics and Properties</b>	
1. Formally define and explain key aspects of geometric figures, including:	
a. interior and exterior angles of polygons;	Interior and exterior angles of polygons
b. segments related to triangles (median, altitude, midsegment);	–
c. points of concurrency related to triangles (centroid, incenter, orthocenter, circumcenter);	–
d. circles (radius, diameter, chord, circumference, major arc, minor arc, sector, segment, inscribed angle).	Parts of a circle Angles in a circle
2. Recognize and explain the necessity for certain terms to remain undefined, such as point, line and plane.	–
3. Make, test and establish the validity of conjectures about geometric properties and relationships using counterexample, inductive and deductive reasoning, and paragraph or two-column proof, including:	

a. prove the Pythagorean Theorem;	<p>The Pythagorean Theorem  Identifying right triangles  Pythagorean triples  Similar right triangles  Calculating sides of a triangle  Finding the length of diagonals using the Pythagorean Theorem  Finding the height of triangles using the Pythagorean Theorem  Using the Pythagorean Theorem to solve problems in context  Finding the distance between two points using the Pythagorean Theorem  Finding the diagonal in a rectangular prism</p>
b. prove theorems involving triangle similarity and congruence;	<p>Congruence and similarity  Similar right triangles  Using congruence and similarity</p>
c. prove theorems involving properties of lines, angles, triangles and quadrilaterals;	<p>Triangles  Quadrilaterals  Lines  Angles  The Triangle Inequality Theorem</p>
d. test a conjecture using basic constructions made with a compass and straightedge or technology.	<p>Constructing triangles  Constructing bisecting lines and angles  Using construction</p>
<b>Spatial Relationships</b>	
4. Construct right triangles, equilateral triangles, parallelograms, trapezoids, rectangles, rhombuses, squares and kites, using compass and straightedge or dynamic geometry software.	<p>Constructing triangles  Using construction</p>
5. Construct congruent figures and similar figures using tools, such as compass, straightedge, and protractor or dynamic geometry software.	<p>–</p>
<b>Transformation and Symmetry</b>	

6. Identify the reflection and rotation symmetries of two- and three-dimensional figures.	Reflection symmetry Rotational symmetry Reflection and rotational symmetry Reflection symmetry in 3-D shapes Rotational symmetry in 3-D shapes
7. Perform reflections and rotations using compass and straightedge constructions and dynamic geometry software.	Rotation Reflection symmetry
8. Derive coordinate rules for translations, reflections and rotations of geometric figures in the coordinate plane.	Combining transformations Reflection symmetry Rotation Translation
9. Show and describe the results of combinations of translations, reflections and rotations (compositions); e.g., perform compositions and specify the result of a composition as the outcome of a single motion, when applicable.	Combining transformations
<b>Visualization and Geometric Models</b>	
10. Solve problems involving chords, radii and arcs within the same circle.	Parts of a circle The length of an arc Angles in a circle Radius and circumference The area of a circle The area of a sector
<b>Grade Eleven</b>	
<b>Spatial Relationships</b>	
1. Use polar coordinates to specify locations on a plane.	–
<b>Transformations and Symmetry</b>	
2. Represent translations using vectors.	Translation Combining transformations Vectors
3. Describe multiplication of a vector and a scalar graphically and algebraically, and apply to problem situations.	Vectors Multiplying vectors by scalars Adding and subtracting vectors Vector calculations The magnitude of a vector Using vectors to solve problems
4. Use trigonometric relationships to determine lengths and angle measures; i.e., Law of Sines and Law of Cosines.	The law of sines The law of cosines

<b>Visualization and Geometric Models</b>	
5. Identify, sketch and classify the cross sections of three-dimensional objects.	Reflection symmetry in 3-D shapes Prisms Pyramids Cylinders, cones and spheres
<b>Grade Twelve</b>	
<b>Transformations and Symmetry</b>	
1. Use matrices to represent translations, reflections, rotations, dilations and their compositions.	Translation Combining transformations Dilation
2. Derive and apply the basic trigonometric identities; i.e., angle addition, angle subtraction and double angle.	–
<b>Visualization and Geometric Models</b>	
3. Relate graphical and algebraic representations of lines, simple curves and conic sections.	Linear graphs The equation of a straight line The equation of a circle
4. Recognize and compare specific shapes and properties in multiple geometries; e.g., plane, spherical and hyperbolic.	–