

Michigan High School Geometry Curriculum Mapping

Geometry	Boardworks High School Geometry presentation
L1.1 Number Systems and Number Sense	
L1.1.6 Explain the importance of the irrational numbers $\sqrt{2}$ and $\sqrt{3}$ in basic right triangle trigonometry, and the importance of pi because of its role in circle relationships.	Radius and circumference Sin, cos and tan of 30, 45 and 60 Special right triangles
L1.2 Representations and Relationships	
L1.2.3 Use vectors to represent quantities that have magnitude and direction, interpret direction and magnitude of a vector numerically, and calculate the sum and difference of two vectors.	Vectors Multiplying vectors by scalars Adding and subtracting vectors Vector calculations The magnitude of a vector Using vectors to solve problems
L2.3 Measurement Units, Calculations, and Scales	
L2.3.1 Convert units of measurement within and between systems; explain how arithmetic operations on measurements affect units, and carry units through calculations correctly.	Converting units Customary units Continuous measurement Calculations involving bounds Compound measures
G1.1 Lines and Angles; Basic Euclidean and Coordinate Geometry	
G1.1.1 Solve multistep problems and construct proofs involving vertical angles, linear pairs of angles, supplementary angles, complementary angles, and right angles.	Lines Angles Using angles
G1.1.2 Solve multistep problems and construct proofs involving corresponding angles, alternate interior angles, alternate exterior angles, and same-side (consecutive) interior angles.	Lines Angles Using angles Interior and exterior angles in polygons
G1.1.3 Perform and justify constructions, including midpoint of a line segment and bisector of an angle, using straightedge and compass.	Constructing triangles Constructing bisecting lines and angles Using construction
G1.1.4 Given a line and a point, construct a line through the point that is parallel to the original line using straightedge and compass. Given a line and a point, construct a line through the point that is perpendicular to the original line. Justify the steps of the constructions.	Constructing bisecting lines and angles

G1.1.5 Given a line segment in terms of its endpoints in the coordinate plane, determine its length and midpoint.	The distance between two points The midpoint of a line segment
G1.1.6 Recognize Euclidean geometry as an axiom system. Know the key axioms and understand the meaning of and distinguish between undefined terms, axioms, definitions, and theorems.	–
G1.2 Triangles and Their Properties	
G1.2.1 Prove that the angle sum of a triangle is 180° and that an exterior angle of a triangle is the sum of the two remote interior angles.	Triangles
G1.2.2 Construct and justify arguments and solve multistep problems involving angle measure, side length, perimeter, and area of all types of triangles.	Triangles Area formulas and calculations Right triangles Calculating sides of a triangle Finding the height of triangles using the Pythagorean Theorem Opposite and adjacent sides The area of a triangle Similar right triangles Special right triangles
G1.2.3 Know a proof of the Pythagorean Theorem, and use the Pythagorean Theorem and its converse to solve multi-step problems.	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
G1.2.4 Prove and use the relationships among the side lengths and the angles of 30° - 60° - 90° triangles and 45° - 45° - 90° triangles.	Special right triangles Right triangles
G1.2.5 Solve multistep problems and construct proofs about the properties of medians, altitudes and perpendicular bisectors to the sides of a triangle, and the angle bisectors of a triangle. Using a straightedge and compass, construct these lines.	Constructing triangles Constructing bisecting lines and angles Using construction
G1.3 Triangles and Trigonometry	

G1.3.1 Define the sine, cosine, and tangent of acute angles in a right triangle as ratios of sides. Solve problems about angles, side lengths, or areas using trigonometric ratios in right triangles.	Right triangles The sine ratio The cosine ratio The tangent ratio Trigonometry summary
G1.3.2 Know and use the Law of Sines and the Law of Cosines and use them to solve problems. Find the area of a triangle with sides a and b and included angle θ using the formula $\text{Area} = (1/2) ab \sin \theta$.	The area of a triangle The law of sines The law of cosines
G1.3.3 Determine the exact values of sine, cosine, and tangent for 0° , 30° , 45° , 60° , and their integer multiples and apply in various contexts.	Opposite and adjacent sides The sine, cosine and tangent of any angle Trig value functions on the unit circle Sin, cos and tan of 30° , 45° and 60° Applying trigonometry Inverses in trigonometry
G1.4 Quadrilaterals and Their Properties	
G1.4.1 Solve multistep problems and construct proofs involving angle measure, side length, diagonal length, perimeter, and area of squares, rectangles, parallelograms, kites, and trapezoids.	Quadrilaterals Area formulas and calculations
G1.4.2 Solve multistep problems and construct proofs involving quadrilaterals using Euclidean methods or coordinate geometry.	–
G1.4.3 Describe and justify hierarchical relationships among quadrilaterals.	Quadrilaterals
G1.4.4 Prove theorems about the interior and exterior angle sums of a quadrilateral.	Interior and exterior angles of polygons
G1.5 Other Polygons and Their Properties	
G1.5.1 Know and use subdivision or circumscription methods to find areas of polygons.	Using area formulas Area formulas and calculations
G1.5.2 Know, justify, and use formulas for the perimeter and area of a regular n-gon and formulas to find interior and exterior angles of a regular n-gon and their sums.	Polygons Interior and exterior angles of polygons Area formulas and calculations
G1.6 Circles and Their Properties	
G1.6.1 Solve multistep problems involving circumference and area of circles.	Radius and circumference The area of a circle The length of an arc The area of a sector
G1.6.2 Solve problems and justify arguments about chords and lines tangent to circles.	Parts of a circle

G1.6.3 Solve problems and justify arguments about central angles, inscribed angles, and triangles in circles.	Angles in a circle
G1.6.4 Know and use properties of arcs and sectors, and find lengths of arcs and areas of sectors.	The length of an arc The area of a sector
G1.8 Three-dimensional Figures	
G1.8.1 Solve multistep problems involving surface area and volume of pyramids, prisms, cones, cylinders, hemispheres, and spheres.	Prisms Pyramids Cylinders, cones and spheres Using length, area and volume formulas Surface area of rectangular prisms Volume of rectangular prisms
G1.8.2 Identify symmetries of pyramids, prisms, cones, cylinders, hemispheres, and spheres.	Reflection symmetry in 3-D shapes Rotational symmetry in 3-D shapes
G2.1 Relationships Between Area and Volume Formulas	
G2.1.1 Know and demonstrate the relationships between the area formula of a triangle, the area formula of a parallelogram, and the area formula of a trapezoid.	Area formulas and calculations The area of a triangle Quadrilaterals
G2.1.2 Know and demonstrate the relationships between the area formulas of various quadrilaterals.	Area formulas and calculations Quadrilaterals
G2.1.3 Know and use the relationship between the volumes of pyramids and prisms.	Prisms Pyramids
G2.2 Relationships Between Two-dimensional and Three-dimensional Representations	
G2.2.1 Identify or sketch a possible three-dimensional figure, given two-dimensional views. Create a two-dimensional representation of a three-dimensional figure.	Reflection symmetry in 3-D shapes Rotational symmetry in 3-D shapes
G2.2.2 Identify or sketch cross sections of three-dimensional figures. Identify or sketch solids formed by revolving two-dimensional figures around lines.	Reflection symmetry in 3-D shapes Rotational symmetry in 3-D shapes
G2.3 Congruence and Similarity	
G2.3.1 Prove that triangles are congruent using the SSS, SAS, ASA, and AAS criteria and that right triangles are congruent using the hypotenuse-leg criterion.	Congruence and similarity Similar right triangles
G2.3.2 Use theorems about congruent triangles to prove additional theorems and solve problems, with and without use of coordinates.	Congruence and similarity Using congruence and similarity

G2.3.3 Prove that triangles are similar by using SSS, SAS, and AA conditions for similarity.	Congruence and similarity Using congruence and similarity
G2.3.4 Use theorems about similar triangles to solve problems with and without use of coordinates.	Similar right triangles Congruence and similarity Using congruence and similarity
G2.3.5 Know and apply the theorem stating that the effect of a scale factor of k relating one two-dimensional figure to another or one three-dimensional figure to another, on the length, area, and volume of the figures, is to multiply each by k , k^2 , and k^3 , respectively.	Dilation The center of dilation
G3.1 Distance-preserving Transformations Isometries	
G3.1.1 Define reflection, rotation, translation, and glide reflection and find the image of a figure under a given isometry.	Reflection symmetry Rotational symmetry Reflection and rotational symmetry Reflection symmetry in 3-D shapes Rotational symmetry in 3-D shapes Translation Rotation Combining transformations
G3.1.2 Given two figures that are images of each other under an isometry, find the isometry and describe it completely.	Reflection symmetry Rotational symmetry Reflection and rotational symmetry Reflection symmetry in 3-D shapes Rotational symmetry in 3-D shapes Translation Rotation Combining transformations
G3.1.3 Find the image of a figure under the composition of two or more isometries and determine whether the resulting figure is a reflection, rotation, translation, or glide reflection image of the original figure.	Reflection symmetry Rotational symmetry Reflection and rotational symmetry Reflection symmetry in 3-D shapes Rotational symmetry in 3-D shapes Translation Rotation Combining transformations
G3.2 Shape-preserving Transformations: Dilations and Isometries	

G3.2.1 Know the definition of dilation and find the image of a figure under a given dilation.	Dilation The center of dilation
G3.2.2 Given two figures that are images of each other under some dilation, identify the center and magnitude of the dilation.	Dilation The center of dilation