

## Massachusetts High School Geometry Curriculum Mapping

Geometry	Boardworks High School Geometry presentation
<b>Geometry</b>	
G.G.1 Recognize special types of polygons (e.g., isosceles triangles, parallelograms, and rhombuses). Apply properties of sides, diagonals, and angles in special polygons; identify their parts and special segments (e.g., altitudes, midsegments); determine interior angles for regular polygons. Draw and label sets of points such as line segments, rays, and circles. Detect symmetries of geometric figures.	Polygons Interior and exterior angles of polygons Using polygons Reflection symmetry Rotational symmetry Triangles Quadrilaterals Right triangles Parts of a circle
G.G.2 Write simple proofs of theorems in geometric situations, such as theorems about congruent and similar figures, parallel or perpendicular lines. Distinguish between postulates and theorems. Use inductive and deductive reasoning, as well as proof by contradiction. Given a conditional statement, write its inverse, converse, and contrapositive.	Congruence and similarity Using congruence and similarity Parallel and perpendicular lines
G.G.3 Apply formulas for a rectangular coordinate system to prove theorems.	The distance between two points The midpoint of a line segment Slopes and intercepts The equation of a straight line The equation of a circle Using circle properties
G.G.4 Draw congruent and similar figures using a compass, straightedge, protractor, or computer software. Make conjectures about methods of construction. Justify the conjectures by logical arguments. (10.G.2)	Constructing triangles Constructing bisecting lines and angles Using construction Congruence and similarity
G.G.5 Apply congruence and similarity correspondences and properties of the figures to find missing parts of geometric figures, and provide logical justification. (10.G.4)	Congruence and similarity Using congruence and similarity

G.G.6 Apply properties of angles, parallel lines, arcs, radii, chords, tangents, and secants to solve problems.	Lines Angles Parts of a circle Parallel and perpendicular lines Angles in a circle
G.G.7 Solve simple triangle problems using the triangle angle sum property, and/or the Pythagorean theorem. (10.G.5)	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 Triangles
G.G.8 Use the properties of special triangles (e.g., isosceles, equilateral, 30°-60°-90°, 45°-45°-90°) to solve problems. (10.G.6)	Triangles Right triangles Sin, cos and tan of 30, 45, and 60. Special right triangles
G.G.9 Define the sine, cosine, and tangent of an acute angle. Apply to the solution of problems.	Right triangles The sine ratio The cosine ratio The tangent ratio Trigonometry summary
G.G.10 Apply the triangle inequality and other inequalities associated with triangles (e.g., the longest side is opposite the greatest angle) to prove theorems and solve problems.	The Triangle Inequality Theorem Triangles

G.G.11 Demonstrate an understanding of the relationship between various representations of a line. Determine a line's slope and x- and y-intercepts from its graph or from a linear equation that represents the line. Find a linear equation describing a line from a graph or a geometric description of the line, e.g., by using the 'point-slope' or 'slope y-intercept' formulas. Explain the significance of a positive, negative, zero, or undefined slope. (10.P.2)	The equation of a straight line Slopes and intercepts
G.G.12 Using rectangular coordinates, calculate midpoints of segments, slopes of lines and segments, and distances between two points, and apply the results to the solutions of problems. (10.G.7)	The distance between two points The midpoint of a line segment Slopes and intercepts The equation of a straight line
G.G.13 Find linear equations that represent lines either perpendicular or parallel to a given line and through a point, e.g., by using the 'point-slope' form of the equation. (10.G.8)	The equation of a straight line Parallel and perpendicular lines
G.G.14 Demonstrate an understanding of the relationship between geometric and algebraic representations of circles.	The equation of a circle Using circle properties Tangents and normals
G.G.15 Draw the results, and interpret transformations on figures in the coordinate plane, e.g., translations, reflections, rotations, scale factors, and the results of successive transformations. Apply transformations to the solution of problems. (10.G.9)	Dilation The center of dilation Reflection symmetry Rotational symmetry Reflection and rotation symmetry Reflection symmetry in 3-D shapes Rotational symmetry in 3-D shapes Translation Rotation Combining transformations
G.G.16 Demonstrate the ability to visualize solid objects and recognize their projections and cross sections. (10.G.10)	Reflection symmetry in 3-D shapes Rotational symmetry in 3-D shapes
G.G.17 Use vertex-edge graphs to model and solve problems. (10.G.11)	–
G.G.18 Use the notion of vectors to solve problems. Describe addition of vectors and multiplication of a vector by a scalar, both symbolically and pictorially. Use vector methods to obtain geometric results. (12.G.3)	Vectors Multiplying vectors by scalars Adding and subtracting vectors Vector calculations Using vectors to solve problems
<b>Measurement</b>	

<p>G.M.1 Calculate perimeter, circumference, and area of common geometric figures such as parallelograms, trapezoids, circles, and triangles. (10.M.1)</p>	<p>Using length, area and volume calculations  Area formulas and calculations  Using area formulas  The area of a triangle  The area of a circle  Radius and circumference  Quadrilaterals  Triangles</p>
<p>G.M.2 Given the formula, find the lateral area, surface area, and volume of prisms, pyramids, spheres, cylinders, and cones, e.g., find the volume of a sphere with a specified surface area. (10.M.2)</p>	<p>Prisms  Pyramids  Cylinders, cones and spheres  Using length, area and volume formulas  Surface area of rectangular prisms  Volume of right rectangular prisms</p>
<p>G.M.3 Relate changes in the measurement of one attribute of an object to changes in other attributes, e.g., how changing the radius or height of a cylinder affects its surface area or volume. (10.M.3)</p>	<p>Prisms  Pyramids  Cylinders, cones and spheres  Using length, area and volume formulas  Surface area of rectangular prisms  Volume of right rectangular prisms</p>
<p>G.M.4 Describe the effects of approximate error in measurement and rounding on measurements and on computed values from measurements. (10.M.4)</p>	<p>Continuous measurements  Calculations involving bounds</p>
<p>G.M.5 Use dimensional analysis for unit conversion and to confirm that expressions and equations make sense. (12.M.2)</p>	<p>–</p>