

Geometry BIE Essential Standards

Interim 1 Geometry Standards		
Standards	Content	Instructional Days
M.BIE.GEO. CO. A.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	5-6
M.BIE.GEO. CO. A.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	6-7
M.BIE.GEO. CO. A.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	5-6
M.BIE.GEO. CO. A.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	5-6
M.BIE.GEO. CO. A.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	6-7
M.BIE.GEO. CO. B.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	5-6
M.BIE.GEO. CO. B.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	6-7
M.BIE.GEO. CO. B.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	6-7
M.BIE.GEO. CO. C.9	Prove theorems about lines and angles. <i>Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.</i>	5-6
M.BIE.GEO. CO. C.10	Prove theorems about triangles. <i>Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.</i>	5-6

M.BIE.GEO. CO. C.11	Prove theorems about parallelograms. <i>Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.</i>	5-6
M.BIE.GEO. CO. D.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). <i>Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.</i>	5-6
M.BIE.GEO. CO. D.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	5-6
M.BIE.HS. D.1-2	Solve multi-step contextual problems with degree of difficulty appropriate to the course. <i>Interpret the structure of expressions to represent a quantity in terms of its context. Write expressions in equivalent forms to solve problems.</i>	5-6

Interim 2 Geometry Standards		
M.BIE.GEO.SRT. A.1	Verify experimentally the properties of dilations given by a center and a scale factor:	5-6
M.BIE.GEO.SRT. A.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	6-7
M.BIE.GEO.SRT. A.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	5-6
M.BIE.GEO. CO. C.10	Prove theorems about triangles. <i>Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.</i>	5-6
M.BIE.GEO. CO. C.11	Prove theorems about parallelograms. <i>Theorems include opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.</i>	5-6
M.BIE.GEO. CO. A	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	5-6
M.BIE.GEO. CO. B	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given	5-6

	rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	
M.BIE.GEO. CO. C	Prove theorems about lines and angles. <i>Theorems include vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.</i>	5-6
M.BIE.GEO. CO. D	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). <i>Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.</i>	6-7

Interim 3 Geometry Standards		
M.BIE.GEO. MG. A1.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	5-6
M.BIE.GEO. MG. A1.2	Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).	5-6
M.BIE.GEO. MG. A1.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).	6-7
M.BIE.GEO.SRT. B.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	5-6
M.BIE.GEO.GMD. A.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. <i>Use dissection arguments, Cavalieri's principle, and informal limit arguments.</i>	5-6
M.BIE.GEO.GMD. B.4	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	5-6
M.BIE.GEO.SRT. C.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	6-7
M.BIE.GEO.SRT. C.7	Explain and use the relationship between the sine and cosine of complementary angles.	5-6
M.BIE.GEO.SRT. C.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	6-7

