

Knowre Math: **Geometry** Curriculum

Chapter 1 Basics of Geometry

Lesson	Topic	GA Standards for Excellence
1-1 Undefined Terms	A) Points, Lines, and Planes	MGSE9-12.G.CO.1
	B) Line Segments	
	C) Rays	
1-2 Segments	A) Distance	MGSE9-12.G.CO.1, MGSE9-12.G.CO.12
	B) Segment Addition Postulate	
	C) Congruent Segments	
1-3 Distance and Midpoint	A) Distance and the Distance Formula	MGSE9-12.G.CO.1, MGSE9-12.G.CO.12, MGSE9-12.G.GPE.4
	B) Midpoint and the Midpoint Formula	
	C) Segment Bisectors	
1-4 Angles	A) Naming Angles	MGSE9-12.G.CO.1, MGSE9-12.G.CO.12
	B) Measuring and Classifying Angles	
	C) Angle Addition Postulate	
1-5 Angle Relationships	A) Complementary and Supplementary	MGSE9-12.G.5
	B) Linear Pairs and Vertical Angles	
	C) Angle Bisectors	
1-6 Perimeter and Area	A) Perimeter of Squares, Rectangles, and Triangles	MGSE9-12.G.GPE.7, MGSE9-12.G.GMD.1a, MGSE9-12.G.MG.3
	B) Area of Squares, Rectangles, and Triangles	
	C) Circumference and Area of Circles	

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Chapter 2 Reasoning and Proof

Lesson	Topic	GA Standards for Excellence
2-1 Conditional and Biconditional Statements	A) Conditional and Biconditional Statements	
	B) Counterexamples	
	C) Inverses, Converses, and Contrapositives	
2-2 Algebraic Proofs	A) Properties of Equality	MGSE9-12A.REI.1
	B) Distributive Property	
	C) Algebraic Proof	
2-3 Introduction to Geometric Proof	A) Properties of Segment Congruence	MGSE9-12.G.CO.9
	B) Properties of Angle Congruence	
	C) Proving Segments and Angles Congruent	
2-4 Proof and Angle Relationships	A) Postulates and Theorems	MGSE9-12.G.CO.9
	B) Right Angle and Vertical Angle Theorems	
	C) Congruent Complements and Supplements Theorems	

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Chapter 3 Parallel and Perpendicular Lines

Lesson	Topic	GA Standards for Excellence
3-1 Parallel Lines and Transversals	A) Parallel and Skew Lines	MGSE9-12.G.CO.12
	B) Transversals and Angle Relationships	
3-2 Parallel Lines and Angle Pairs	A) Corresponding Angles Postulate	MGSE9-12.G.CO.9
	B) Alternate Interior, Alternate Exterior, and Consecutive Interior Angles Theorems	
3-3 Proving Lines Parallel	A) Converse of Corresponding Angles Postulate	MGSE9-12.G.CO.9
	B) Converse of Alternate Interior, Alternate Exterior, and Consecutive Interior Angles Theorems	
3-4 Parallel and Perpendicular Lines	A) Perpendicular Lines	MGSE9-12.G.CO.1, MGSE9-12.G.CO.9, MGSE9-12.G.CO.12
	B) Parallel and Perpendicular Line Theorems	
	C) Perpendicular Bisectors	
3-5 Equations of Lines	A) Slope	MGSE9-12.G.GPE.4
	B) Slope-Intercept Form	
	C) Point-Slope Form	
3-6 Slopes of Parallel and Perpendicular Lines	A) Lines with Undefined and Zero Slope	MGSE9-12.G.CO.1, MGSE9-12.G.GPE.4, MGSE9-12.G.GPE.5
	B) Slopes of Parallel and Perpendicular Lines	
	C) Equations of Parallel and Perpendicular Lines	

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Chapter 4 Congruent Triangles

Lesson	Topic	GA Standards for Excellence
4-1 Angles of Triangles	A) Triangle-Angle Sum Theorem	MGSE9-12.G.CO.10
	B) Interior and Exterior Angles of Triangles	
	C) Triangle Exterior Angle Theorem	
4-2 Classifying Triangles	A) Triangle Notation	MGSE9-12.G.CO.12, MGSE9-12.G.CO.13
	B) Classifying Triangles by their Angles	
	C) Classifying Triangles by their Sides	
4-3 Properties of Isosceles and Equilateral Triangles	A) Components of Isosceles Triangles	MGSE9-12.G.CO.10
	B) Properties of Isosceles and Equilateral Triangles	
4-4 Congruent Figures	A) Congruent Polygons	MGSE9-12.G.CO.6, MGSE9-12.G.CO.7, MGSE9-12.G.CO.8, MGSE9-12.G.SRT.5
	B) Congruence Statements	
	C) Third Angle Theorem and Corresponding Parts of Congruent Triangles	
4-5 Proving Triangle Congruence	A) Side-Side-Side, Side-Angle-Side, and Angle-Side-Angle Congruence Postulates	MGSE9-12.G.CO.6, MGSE9-12.G.CO.7, MGSE9-12.G.CO.8, MGSE9-12.G.SRT.5
	B) Angle-Angle-Side and Hypotenuse-Leg Congruence Theorems	
	C) Identifying Reasons for Triangle Congruence	

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Chapter 5 Relationships in Triangles

Lesson	Topic	GA Standards for Excellence
5-1 Bisectors	A) Distance from a Point to a Line	MGSE9-12.G.CO.9, MGSE9-12.G.CO.10, MGSE9-12.G.CO.12
	B) Angle Bisector Theorem and Its Converse	
	C) Perpendicular Bisector Theorem and Its Converse	
5-2 Perpendicular and Angle Bisectors in Triangles	A) Perpendicular Bisectors of Triangles and Circumcenters	MGSE9-12.G.CO.13, MGSE9-12.G.SRT.5, MGSE9-12.G.C.3, MGSE9-12.G.GPE.4, MGSE9-12.G.GPE.5
	B) Angle Bisectors of Triangles and Incenters	
5-3 Medians and Altitudes in Triangles	A) Medians of Triangles and Centroids	MGSE9-12.G.CO.10, MGSE9-12.G.GPE.4, MGSE9-12.G.GPE.5
	B) Altitudes of Triangles and Orthocenters	
5-4 Angle-Side Relationships in Triangles	A) Using Side Lengths to Compare Interior Angle Measures	MGSE9-12.G.CO.10
	B) Using Interior Angle Measures to Compare Side Lengths	
5-5 Triangle Inequalities	A) Triangle Inequality Theorem	MGSE9-12.G.CO.10
	B) Determining Possible Lengths of a Missing Side in a Triangle	

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Chapter 6 Polygons and Quadrilaterals

Lesson	Topic	GA Standards for Excellence
6-1 Introduction to Polygons	A) Identifying and Naming Polygons	MGSE9-12.G.CO.13
	B) Identifying Concave and Convex Polygons	
	C) Properties of Regular Polygons	
6-2 Angles of Polygons	A) Sum of the Measures of the Interior Angles in Convex Polygons	MGSE9-12.G.MG.1
	B) Sum of the Measures of the Exterior Angles of Convex Polygons	
	C) Measure of Each Interior and Exterior Angle in Regular Convex Polygons	
6-3 Parallelograms	A) Definition of Parallelogram	MGSE9-12.G.CO.11, MGSE9-12.G.GPE.4, MGSE9-12.G.GPE.7
	B) Opposite Sides and Angles of Parallelograms	
	C) Diagonals of Parallelograms	
6-4 Test for Parallelograms	A) Using Opposite Sides, Opposite Angles, or Diagonals to Prove a Quadrilateral is a Parallelogram	MGSE9-12.G.CO.11
	B) Determining if Quadrilaterals are Parallelograms	
6-5 Rectangles	A) Definition of Rectangle	MGSE9-12.G.CO.11
	B) Properties of Diagonals of Rectangles	
	C) Determining if a Parallelogram is a Rectangle	
6-6 Rhombuses and Squares	A) Definition of Rhombus and Square	MGSE9-12.G.CO.11
	B) Properties of Rhombuses and Squares	
	C) Determining if a Parallelogram is a Rhombus or a Square	
6-7 Trapezoids and their Midsegments	A) Definition of Trapezoid and Isosceles Trapezoid	MGSE9-12.G.CO.11
	B) Base Angles and Diagonals of Isosceles Trapezoids	
	C) Midsegments of Trapezoids	
6-8 Kites	A) Definition of Kite	MGSE9-12.G.CO.11
	B) Diagonals of Kites	
	C) Opposite Angles in Kites	

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Chapter 7 Transformations

Lesson	Topic	GA Standards for Excellence
7-1 Transformation Notation and Translations	A) Transformation Notation	MGSE9-12.G.CO.2,
	B) Identifying Translations	MGSE9-12.G.CO.4,
	C) Writing Translation Vectors as Translation Functions	MGSE9-12.G.CO.5, MGSE9-12.G.CO.6
7-2 Reflections	A) Reflecting in Horizontal and Vertical Lines	MGSE9-12.G.CO.2,
	B) Reflecting in $y=x$ and $y=-x$	MGSE9-12.G.CO.4, MGSE9-12.G.CO.5,
	C) Determining a Line of Reflection	MGSE9-12.G.GPE.4
7-3 Symmetry and Rotations	A) Lines of Symmetry	MGSE9-12.G.CO.2,
	B) Rotational Symmetry	MGSE9-12.G.CO.4,
	C) Rotating a Figure about a Point	MGSE9-12.G.CO.5
7-4 Dilations	A) Dilation about a Point	MGSE9-12.G.CO.2,
	B) Determining if Transformations are Dilations	MGSE9-12.G.CO.5, MGSE9-12.G.SRT.1a,
	C) Dilation about the Origin	MGSE9-12.G.SRT.1b
7-5 Composition of Isometries	A) Compositions of Reflections in Parallel or Intersecting Lines	MGSE9-12.G.CO.2,
	B) Glide Reflections	MGSE9-12.G.CO.3, MGSE9-12.G.CO.4,
	C) Performing and Identifying Compositions of Isometries	MGSE9-12.G.CO.5

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Chapter 8 Similar Figures

Lesson	Topic	GA Standards for Excellence
8-1 Ratio and Proportion	A) Ratios and Proportions	MGSE6.RP.1, MGSE7.RP.3
	B) Equivalent Proportions	
	C) Solving Proportions	
8-2 Directed Line Segments	A) Ratios and Segments	MGSE9-12.G.GPE.6
	B) Using Ratios of Segments to Determine Segment Length	
	C) Using Ratios of Segments to Determine the Coordinates of a Point on a Segment	
8-3 Similar Polygons	A) Similarity and Proportionality Statements	MGSE9-12.G.SRT.2
	B) Using Similarity Statements to Identify Corresponding Parts	
	C) Scale Factor	
8-4 Similar Triangles	A) Angle-Angle Triangle Similarity Postulate	MGSE9-12.G.SRT.2, MGSE9-12.G.SRT.3, MGSE9-12.G.SRT.5
	B) Side-Side-Side and Side-Angle-Side Similarity Theorems	
	C) Missing Measures in Similar Triangles	
8-5 Proportions in Triangles	A) Parallel Lines and Proportional Segments	MGSE9-12.G.CO.10, MGSE9-12.G.SRT.4, MGSE9-12.G.SRT.5
	B) Angle Bisectors and Proportional Segments	
8-6 Midsegments of Triangles	A) Parallel Segments	MGSE9-12.G.CO.10, MGSE9-12.G.SRT.5
	B) Length Relationships	

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Chapter 9 Right Triangles and Trigonometry

Lesson	Topic	GA Standards for Excellence
9-1 Right Triangle Similarity	A) Right Triangles and Proportionality Statements	MGSE9-12.G.SRT.4, MGSE9-12.G.SRT.5
	B) Missing Measures in Similar Right Triangles	
9-2 Pythagorean Theorem and Pythagorean Inequalities	A) Pythagorean Theorem	MGSE9-12.G.SRT.4
	B) Pythagorean Triples	
	C) Pythagorean Inequalities	
9-3 Isosceles Right Triangles	A) Determine the Length of the Hypotenuse from a Leg	MGSE9-12.G.SRT.6
	B) Determine the Length of a Leg from the Hypotenuse	
9-4 30°-60°-90° Triangles	A) Determine the Length of the Long Leg and the Hypotenuse from the Short Leg	MGSE9-12.G.SRT.6
	B) Determine the Length of the Short Leg and the Long Leg from the Hypotenuse	
	C) Determine the Length of the Short Leg and the Hypotenuse from the Long Leg	
9-5 Trigonometric Ratios	A) Sine, Cosine, and Tangent Ratios	MGSE9-12.G.SRT.6, MGSE9-12.G.SRT.7
	B) Relationship Between the Sine and Cosine Ratios for Complementary Angles	
	C) Inverse Trigonometric Ratios	
9-6 Solving Right Triangles	A) Use Trigonometry to Determine Missing Side Lengths and Angle Measures in Right Triangles	MGSE9-12.G.SRT.8
	B) Angles of Elevation and Depression	
	C) Using Angles of Elevation and Depression to Determine Missing Lengths	
9-7 Area of Triangles and Law of Sines	A) Area of Triangles using Sine	MGSE9-12.G.SRT.9, MGSE9-12.G.SRT.10, MGSE9-12.G.SRT.11
	B) Law of Sines to Determine Measures of Missing Lengths in Triangles	
	C) Law of Sines to Determine Measures of Interior Angles in Obtuse Triangles	
9-8 Law of Cosines	A) Law of Cosines to Determine Measures of Missing Lengths in Triangles	MGSE9-12.G.SRT.10, MGSE9-12.G.SRT.11
	B) Law of Cosines to Determine Measures of Interior Angles in Triangles	

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Chapter 10 Circles

Lesson	Topic	GA Standards for Excellence
10-1 Introduction to Circles	A) Segments in Circles	MGSE9-12.G.CO.1, MGSE9-12.G.C.2
	B) Major and Minor Arcs	
	C) Central Angles	
10-2 Tangents	A) Tangent Lines and Circles	MGSE9-12.G.C.2
	B) Tangent Lines and Radii	
	C) Lengths of Tangent Segments Intersecting in the Exterior of a Circle	
10-3 Inscribed Angles	A) Inscribed Angles and Their Intercepted Arcs	MGSE9-12.G.C.2, MGSE9-12.G.C.3
	B) Inscribed Angles That Intersect the Same Arc	
	C) Right Triangles and Quadrilaterals Inscribed in Circles	
10-4 Special Segment and Angle Relationships	A) Measures of Angles formed by Segments Intersecting in the Interior or Exterior of a Circle	MGSE9-12.G.C.2, MGSE9-12.G.C.3
	B) Lengths of Segments Intersecting in the Interior or Exterior of a Circle	
10-5 Chord Theorems	A) Congruent Chords and Their Intercepted Arcs	MGSE9-12.G.C.2
	B) Perpendicular Diameters and Chords	
	C) Chords That are Equidistant from the Center	
10-6 Equations of Circles	A) Write an Equation of a Circle	MGSE9-12.G.CO.1, MGSE9-12.G.C.1, MGSE9-12.G.GPE.1
	B) Determine the Center and the Radius from an Equation of a Circle	
	C) Similar Circles	

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Chapter 11 Perimeter, Area, and Circumference

Lesson	Topic	GA Standards for Excellence
11-1 Areas of Quadrilaterals	A) Area of Parallelograms, Kites, Rhombuses, and Trapezoids	MGSE9-12.G.MG.1, MGSE9-12.G.MG.3
11-2 Areas of Triangles	A) Area of Triangles Given Base and Height	MGSE9-12.G.MG.3
	B) Area of Equilateral Triangles Given Side Length	
11-3 Perimeter and Area of Regular Polygons	A) Perimeter of Regular Polygons	MGSE9-12.G.MG.3
	B) Area of Regular Polygons Given Apothem or Perimeter	
11-4 Area of Regular Polygons with Right Triangles	A) Area of Regular Polygons Using Special Right Triangles	MGSE9-12.G.SRT.8, MGSE9-12.G.MG.3
	B) Area of Regular Polygons Using Trigonometry	
11-5 Arc Length and Sectors	A) Use Arc Length to Determine Measures of Segments and Angles in a Circle	MGSE9-12.G.C.5, MGSE9-12.G.MG.1, MGSE9-12.G.MG.3
	B) Use Sectors to Determine Measures of Segments and Angles in a Circle	

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Chapter 12 Solids

Lesson	Topic	GA Standards for Excellence
12-1 Introduction to Solids	A) Faces, Vertices, Edges	MGSE9-12.G.GMD.4, MGSE9-12.G.MG.3
	B) Naming Solids	
	C) Rotations of Two-Dimensional Figures	
12-2 Surface Area of Prisms and Cylinders	A) Surface Area Given Nets	MGSE9-12.G.MG.1, MGSE9-12.G.MG.3
	B) Lateral Area of Right Prisms and Cylinders	
	C) Surface Area of Right Prisms and Cylinders	
12-3 Surface Area of Pyramids and Cones	A) Surface Area Given Nets	MGSE9-12.G.MG.1, MGSE9-12.G.MG.3, MGSE9-12.G.MG.3
	B) Lateral Area of Right Pyramids and Cones	
	C) Surface Area of Right Pyramids and Cones	
12-4 Volume of Prisms and Cylinders	A) Volume of Right Prisms and Cylinders	MGSE9-12.G.GMD.1a, MGSE9-12.G.GMD.1b, MGSE9-12.G.GMD.3, MGSE9-12.G.MG.1, MGSE9-12.G.MG.3, MGSE9-12.G.MG.3
	B) Volume of Oblique Prisms and Cylinders	
12-5 Volume of Pyramids and Cones	A) Volume of Right Pyramids and Cones	MGSE9-12.G.GMD.1a, MGSE9-12.G.GMD.1b, MGSE9-12.G.GMD.3, MGSE9-12.G.GMD.4, MGSE9-12.G.MG.1, MGSE9-12.G.MG.3, MGSE9-12.G.MG.3
	B) Volume of Oblique Pyramids and Cones	
12-6 Surface Area and Volume of Spheres	A) Segments in Spheres	MGSE9-12.G.GMD.2, MGSE9-12.G.GMD.3, MGSE9-12.G.MG.2, MGSE9-12.G.MG.3
	B) Surface Area of Spheres	
	C) Volume of Spheres	
12-7 Ratios of Lengths, Areas, and Volumes of Similar Figures	A) Ratios of Length, Area, and Volume in Similar Solids	MGSE9-12.G.SRT.5, MGSE9-12.G.GMD.3, MGSE9-12.G.MG.2
	B) Using Ratios of Similar Figures to Find Lengths, Areas, and Volumes	