



GEOMETRY

CURRICULUM GUIDE

Overview and Scope & Sequence

Loudoun County Public Schools
2017-2018

(Additional curriculum information and resources for teachers can be accessed through CMS and VISION)

Geometry Nine Week Overview

Addendum

1 st Quarter	2 nd Quarter
<p><u>Unit 1-Classroom Routines:</u> <u>Process Goals: Classroom Routines</u> <u>A.4b</u>: Justify steps using properties <u>A.6a</u>: Slope of a line <u>A.6b</u>: Graphing Linear Equations <u>A.3</u>: Simplifying square and cube roots</p> <hr style="border: 1px solid black;"/> <p><u>Unit 2-Logic and Reasoning</u> <u>G.1</u>: Logic and reasoning <u>G.1c EKS</u> – <i>Determine that an argument is false using a counterexample (2016)</i></p> <p><u>Unit 3-Essentials of Geometry</u> <u>G.3a</u>: Distance, midpoint, and slope <u>G.4</u>: Constructions and justify constructions <u>G.3a EKS</u> –<i>Determine the endpoint of a segment and midpoint (2016)</i></p> <p><u>Unit 4-Parallel and Perpendicular Lines</u> <u>G.2</u>: Parallel cut by transversal <u>G.3ab</u>: Using slope to determine parallel and perpendicular Distance, midpoint, and slope <u>G.1</u>: Logic and reasoning <u>G.4bcdg</u>: Constructions and justify constructions <u>G.2b EKS</u> – <i>Added same-side exterior angles to the required relationships between pairs of angles (2016)</i></p> <p><u>Unit 5-Introduction of Triangles and Congruent Triangles</u> <u>G.5</u>: Use real world situations to analyze triangles</p> <p style="font-size: small;">*Quarterly assessment will cover the quarter 1 content</p>	<p><u>Unit 1-Classroom Routines:</u> <u>A.5</u>: Linear Inequalities</p> <hr style="border: 1px solid black;"/> <p><u>Unit 5-Introduction of Triangles and Congruent Triangles</u> Cont.. <u>G.6</u>: Prove two triangles congruent <u>G.1</u>: Logic and reasoning <u>G.3ab</u>: Distance, midpoint, and slope</p> <p><u>Unit 6-Similar Triangles</u> <u>G.7</u>: Prove two triangles are similar <u>G.1</u>: Logic and reasoning <u>G.3ab</u>: Distance, midpoint, and slope</p> <p><u>Unit 7-Right Triangles</u> <u>G.8</u>: Real world problems Pythagorean Theorem, special right triangles, right triangle trigonometry <u>G.1</u>: Logic and reasoning <u>G.3ab</u>: Distance, midpoint, and slope</p> <p style="font-size: small;">*Quarterly assessment will cover the quarter 2 content</p>
24 blocks	21 blocks

3 rd Quarter	4 th Quarter
<p><u>Unit 1-Classroom Routines:</u> <u>A.3:</u> Radicals <u>A.4cd:</u> Solving linear and quadratic equations <u>A.2c:</u> Factoring</p> <hr/> <p><u>Unit 8-Properties of Quadrilaterals, Angles of Polygons, Symmetry and Transformation</u> <u>G.9:</u> Quadrilaterals <u>G.10:</u> Angles of Polygons <u>G.3:</u> Symmetry, Transformations <u>G.1:</u> Logic and reasoning <u>G.2a:</u> Parallel lines <u>G.5:</u> Analyze triangles <u>G.10b EKS</u> – <i>Determine angle measures of a regular polygon in a tessellation (2016)</i></p> <p><u>Unit 9-Properties of Circles, Equations of Circles, Constructions</u> <u>G.11ab:</u> Properties of Circles <u>G.12:</u> Equation of the Circle <u>G.4:</u> Construct and Justify Lines <u>G.3:</u> Distance, midpoint, slope, symmetry, and transformations <u>G.7:</u> Prove two triangles are similar <u>G.8:</u> Right triangles <u>G.9:</u> Quadrilaterals</p> <p><u>Unit 10-Two and Three Dimensional Figures</u> <u>G.11c:</u> Arc lengths; area of sectors <u>G.13:</u> Three dimensional objects <u>G.14:</u> Comparing geometric objects (2D and 3D) <u>G.7:</u> Prove two triangles are similar <u>G.13 EKS</u> – <i>Determine surface area and volume of hemispheres (2016)</i> <u>G.13 EKS</u> – <i>Solve problems involving lateral area of cylinders, prisms, and regular pyramids (2016)</i></p> <p>*Quarterly assessment will cover the quarter 3 content</p>	<p><u>Unit 1-Classroom Routines:</u> <u>A.4a:</u> Solving Literal Equations</p> <hr/> <p>Review for SOL Assessment & Post SOL Topics</p> <ul style="list-style-type: none"> • Factoring and simplifying polynomial expressions • Graphing linear equations and inequalities in two variables • Operations with polynomial expressions • Simplifying radicals <p>Curriculum completed by 4/6/18</p>
21 blocks	23 blocks total

Geometry Scope & Sequence

Quarter 1: 24 blocks total

*The recommended pacing is based on the assumption that SOL testing will take place in early May. Time for classroom assessments is included within the suggested pacing for each unit.

*Number of blocks	Standard	Reporting Category	Topic
<u>Unit 1 – Classroom Routines (Process Goals: Classroom Routines)</u>			
Entire Quarter	A.4b	<i>Equations and Inequalities</i>	<ul style="list-style-type: none"> Justify steps used in simplifying expressions and solving equations using field properties and axioms of equality
	A.6ab	<i>Equations and Inequalities</i>	<ul style="list-style-type: none"> Determine the slope of a line when given an equation of a line, graph of a line, or two points on the line Write the equation of a line when given the graph of a line, two points on the line or the slope and a point in the line
	A.3	<i>Expressions and Operations</i>	<ul style="list-style-type: none"> Express square roots and cube roots of whole numbers in simplest form Express square roots of monomial expressions in simplest form
<u>Unit 2 – Logic and Reasoning</u>			
Students begin their study of Geometry with a unit on logic and reasoning. Logic and reasoning will spiral through other units. This unit serves as a foundation for students to engage in logical thinking and reasoning throughout the rest of the Geometry course.			
6	G.1a-d	Reasoning Lines and Transformations	<ul style="list-style-type: none"> Begin with contexts outside of mathematics or include mathematics concepts that students are already familiar with. This unit is intended to develop a foundation in reasoning and logic before explore more geometry concepts.
<u>Unit 3 – Essentials of Geometry</u>			
8	G.3a	Reasoning Lines and Transformations	<ul style="list-style-type: none"> Use pictorial representations including computer software, constructions, and coordinate methods to solve problems involving symmetry and transformation. Investigate and use formulas for finding distance, midpoint, and slope
	G.4	Reasoning Lines and Transformations	<ul style="list-style-type: none"> Construct and justify the constructions of: <ul style="list-style-type: none"> Congruent line segments Perpendicular bisectors of a line segment Perpendicular to a given line from a point not on the line Perpendicular to a given line at a given point on the line Bisector of a given angle Angle congruent to a given angle Line parallel to a given line through a point not on the given line Include real-world problems (e.g. engineering, architectural design, and building construction) and include techniques involving the use of a straightedge and compass, paper-folding, and dynamic geometry software.

*Number of blocks	Standard	Reporting Category	Topic:
<u>Unit 4 – Parallel and Perpendicular Lines</u>			
5	G.2	Reasoning Lines and Transformations	<ul style="list-style-type: none"> • Determine whether lines are parallel • Use algebraic, coordinate methods, and deductive proofs to verify parallelism • Solve real world problems
	G.3ab	Reasoning Lines and Transformations	<ul style="list-style-type: none"> • Apply slope to verify and determine whether lines are parallel or perpendicular • Incorporate real world contexts
	G.1	Reasoning, Lines and Transformations	<ul style="list-style-type: none"> • Using logic and reasoning, prove line and angle relationships
	G.4bcdg	Reasoning, Lines and Transformations	<ul style="list-style-type: none"> • Spiral back to constructions and make connect back to constructions in Unit 3. Construct and justify the construction of parallel and perpendicular lines. • Include techniques involving the use of a straightedge and compass, paper-folding, and dynamic geometry software.
<u>Unit 5 – Introduction of Triangles and Congruent Triangles</u>			
3	G.5	Triangles	<ul style="list-style-type: none"> • In the context of real world situations, investigate triangle inequalities
2	Quarterly Assessments, Remediation, and Intervention*		

*These blocks reserved for quarterly assessments, remediation, and intervention should be dispersed throughout the quarter as needed.

Quarter 2: 21 blocks total

*The recommended pacing is based on the assumption that SOL testing will take place in early May. Time for classroom assessments is included within the suggested pacing for each unit.

*Number of blocks	Standard	Reporting Category	Topic:
<u>Unit 1 – Classroom Routines</u>			
<i>Entire Quarter</i>	A.5abc	<i>Equations and Inequalities</i>	<ul style="list-style-type: none"> <i>Solve linear inequalities</i> <i>Include solving real world problems involving linear inequalities</i>
<u>Unit 5 – Introduction of Triangles and Congruent Triangles (continued)</u>			
5	G.6	Triangles	<ul style="list-style-type: none"> Prove two triangles are congruent, using algebraic methods, coordinate methods, and deductive proofs. Incorporate problems in real world contexts
	G.1	Reasoning, Lines and Transformations	<ul style="list-style-type: none"> Spiral in logic and reasoning into this unit.
	G.3ab	Reasoning, Lines and Transformations	<ul style="list-style-type: none"> Present problems on the coordinate plane and weave in the formulas for distance, midpoint, and slope into this unit.
<u>Unit 6 – Similar Triangles</u>			
6	G.7	Triangles	<ul style="list-style-type: none"> Prove two triangles are similar, using algebraic methods, coordinate methods, and deductive proofs. Incorporate problems in real world contexts
	G.1	Reasoning, Lines and Transformations	<ul style="list-style-type: none"> Spiral in logic and reasoning into this unit.
	G.3ab	Reasoning, Lines and Transformations	<ul style="list-style-type: none"> Present problems on the coordinate plane and incorporate the formulas for distance, midpoint, and slope into this unit.
<u>Unit 7 – Right Triangles</u>			
8	G.8	Triangles	The student will solve real-world problems involving right triangles by using the Pythagorean Theorem and its converse, properties of special right triangles, and right triangle trigonometry.
	G.1	Reasoning, Lines and Transformations	Spiral in logic and reasoning into this unit.
	G.3ab	Reasoning, Lines and Transformations	Present problems on the coordinate plane and incorporate the formulas for distance, midpoint, and slope into this unit.
2	Midterm Review, Quarterly Assessments, Remediation, and Intervention*		

*These blocks reserved for quarterly assessment, remediation, and intervention should be dispersed throughout the quarter as needed.

Quarter 3: 21 blocks total

*The recommended pacing is based on the assumption that SOL testing will take place in early May. Time for classroom assessments is included within the suggested pacing for each unit.

*Number of blocks	Standard	Reporting Category	Topic:
<u>Unit 1 – Classroom Routines</u>			
Entire Quarter	A.3	Expressions and operations	<ul style="list-style-type: none"> The student will express the square roots and cube roots of whole numbers and the square root of a monomial algebraic expression in simplest radical form.
	A.4d	Equations and Inequalities	<ul style="list-style-type: none"> solving multistep linear equations algebraically and graphically
	A.2c	Expressions and operations	<ul style="list-style-type: none"> factoring completely first- and second-degree binomials and trinomials in one or two variables. Graphing calculators will be used as a tool for factoring and for confirming algebraic factorizations
	A.4c	Equations and Inequalities	<ul style="list-style-type: none"> solving quadratic equations algebraically and graphically;
<u>Unit 8 – Properties of Quadrilaterals, Angles of Polygons, Symmetry and Transformations</u>			
6	G.9	Polygons, Circles, Three dimensional figures	<ul style="list-style-type: none"> The student will verify characteristics of quadrilaterals and use properties of quadrilaterals to solve real-world problems.
	G.10		<ul style="list-style-type: none"> The student will solve real-world problems involving angles of polygons.
	G.3	Reasoning Lines and transformations	<ul style="list-style-type: none"> Investigate symmetry with respect to a line or a point and determine transformations of figures on coordinate plane. Incorporate the formulas for distance, midpoint, and slope into this unit. Include computer software, constructions, and coordinate methods to solve problems involving symmetry and transformations.
	G.1	Reasoning Lines and transformations	<ul style="list-style-type: none"> Spiral in logic and reasoning into this unit.
	G.2a		<ul style="list-style-type: none"> Incorporate angle relationships for parallel lines into this unit.
	G.5	Triangles	<ul style="list-style-type: none"> Spiral triangles into this unit as it pertains to symmetry and transformations. If time permits, explore tessellations and their properties. Include tessellations that appear in nature.

* The number of blocks reserved for assessment, remediation, and intervention should be dispersed throughout the quarter as needed.

*Number of blocks	Standard	Reporting Category	Topic:
<u>Unit 9 – Properties of Circles, Equations of Circles, Constructions</u>			
9	G.11a, b	Polygons, Circles, and three Dimensional Figures	<ul style="list-style-type: none"> • Investigate, verify, and apply properties of circles and solve real-world problems involving properties of circles
	G.12		<ul style="list-style-type: none"> • Write equations of the circle given coordinates of the center of a circle and a point on the circle. • Make connections between the equation of a circle (given the center of the circle and the radius) with the Pythagorean Theorem.
	G.4	Reasoning, Transformations, and Lines	<ul style="list-style-type: none"> • Spiral in previously learned constructions and include constructing an equilateral triangle, a square, and a regular hexagon inscribed in a circle. • Include constructing inscribed and circumscribed circles of a triangle. • Include constructing the tangent line from a point outside a given circle to the circle. • Include techniques involving the use of a straightedge and compass, paper-folding, and dynamic geometry software.
	G.3	Reasoning Lines and transformations	<ul style="list-style-type: none"> • Incorporate the formulas for distance, midpoint, and slope into this unit.
	G.7	Triangles	<ul style="list-style-type: none"> • Incorporate proving triangles are similar into this unit.
	G.8	Triangles	<ul style="list-style-type: none"> • Incorporate real-world problems involving right triangles, properties of special right triangles, and right triangle trigonometry.
	G.9	Polygons, Circles, Three dimensional figures	<ul style="list-style-type: none"> • Incorporate solving real world problems using properties of quadrilaterals and verifying characteristics of quadrilaterals.

Unit 10—Two and Three Dimensional Figures

4	G.11c	Polygons, Circles, Three dimensional figures	<ul style="list-style-type: none"> Find arc lengths and areas of sectors in circles. Include solving real-world problems using properties of angles, lines, and arcs.
	G.13	Polygons, Circles, Three dimensional figures	<ul style="list-style-type: none"> Calculate the surface area and volume of various three-dimensional objects to solve real-world problems. Include three-dimensional figures that are combinations of other three-dimensional figures.
	G.14	Polygons, Circles, Three dimensional figures	<ul style="list-style-type: none"> Using similar geometric objects in two- or three- dimensions, compare characteristics. Determine how changes in one or more dimensions of an object affect area and/or volume of the object. Determine how changes to the area and/or volume of an object affect one or more dimensions of the object. Solve real-world problems about similar geometric objects.
	G.7	Triangles	Incorporate proving triangles are similar into this unit.
2	Quarterly Assessments, Remediation, and Intervention*		

*These blocks reserved for quarterly assessments, remediation, and intervention should be dispersed throughout the quarter as needed.

Quarter 4: 23 blocks total

*The recommended pacing is based on the assumption that SOL testing will take place in early May. Time for classroom assessments is included within the suggested pacing for each unit.

Number of blocks	Standard	Reporting Category	Topic:
<u>Unit 1 – Classroom Routines</u>			
<i>Entire Quarter</i>	<u>A.4a</u>	<i>Equations and Inequalities</i>	<ul style="list-style-type: none"><i>solving literal equations (formulas) for a given variable;</i>
SOL REVIEW			
9			SOL Review
Unit 11 – Post SOL Content			
13			Factoring Polynomial Division
			Graphing linear equations and inequalities in two variables
			Polynomial operations
			Simplifying radicals
1	Standard 7		

* The number of blocks reserved for assessment, remediation, and intervention should be dispersed throughout the quarter as needed.

Additional information about the Standards of Learning can be found in the

[VDOE 2009 Curriculum Framework](#)

[VDOE 2016 Curriculum Framework](#)

(click link above)

Additional information about math vocabulary can be found in the

[VDOE Vocabulary Word Wall Cards](#)

(click link above)