

Geometry: Polygons

Stage 1 Desired Results		
ESTABLISHED GOALS: <u>Competencies:</u> - Students will demonstrate the ability to solve problems involving one- two- and three-dimensional objects by applying algebraic models and geometric formulas. - Students will demonstrate the ability to reason with definitions, properties, and theorems of geometry to create conjectures and to prove or analyze statements. - Students will demonstrate the ability to analyze and summarize text and integrate knowledge to make meaning of discipline-specific materials. - Students will demonstrate the ability to produce coherent and supported writing in order to communicate effectively for a range of discipline-specific tasks, purposes, and audiences. - Students will demonstrate the ability to speak purposefully and effectively by strategically making decisions about content, language use, and discourse style. <u>Content Standards:</u> - G.CO.11 Prove theorems about parallelograms - G.SRT.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. - G.GPE.4 Use coordinates to prove simple geometric theorems algebraically - G.GPE.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles - G.CO.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 - G.MG.1 Use geometric shapes, their measures, and their properties to describe objects - MP2 Reason abstractly and quantitatively. - MP3 Construct viable arguments and critique the reasoning of others. - MP5 Use appropriate tools strategically. - MP7 Look for and make use of structure. - MP8 Look for and express regularity in repeated reasoning.	Transfer	
	<i>Students will be able to independently use their learning to make determinations about an object based on how it is categorized.</i>	
	Meaning	
	ENDURING UNDERSTANDINGS <i>Students will understand that...</i> - quadrilaterals inherit their properties from a hierarchy of other quadrilaterals. - the area formulas for a triangle and rectangle can be applied to find the area formulas for all quadrilaterals.	ESSENTIAL QUESTIONS When is it appropriate to make a generalization about a group?
	Acquisition	
	<i>Students will know...</i> - that if a quadrilateral is a parallelogram, then its - opposite sides are congruent. - consecutive angles are supplementary. - opposite angles are congruent. - diagonals bisect each other. - that if both pairs of opposite sides of a quadrilateral are congruent, then the quadrilateral is a parallelogram. - that if an angle of a quadrilateral is supplementary to both of its consecutive angles, then the quadrilateral is a parallelogram. - that if both pairs of opposite angles of a quadrilateral are congruent, then the quadrilateral is a parallelogram. - that if the diagonals of a quadrilateral bisect each other, then the quadrilateral is a parallelogram. - that if one pair of opposite sides of a quadrilateral is both congruent and parallel, then the quadrilateral is a parallelogram. - that if a parallelogram is a rhombus, then - its diagonals are perpendicular. - each diagonal bisects a pair of opposite angles.	<i>Students will be skilled at...</i> - determining angle measures using diagonals. - writing coordinate proofs using slope and distance formulas to prove sides/diagonals congruent/parallel/perpendicular. - writing proofs using properties of polygons and special parallelograms . - applying formulas to find area of parallelograms, triangles, trapezoids, rhombuses, kites, and regular polygons. - using trigonometric ratios to find area of regular polygons and any triangle. - using area and perimeter ratios of similar figures to determine unknown values .

	• <i>that if a parallelogram is a rectangle, then its diagonals are congruent.</i> • <i>that if the diagonals of a parallelogram are perpendicular, then the parallelogram is a rhombus.</i> • <i>that if one diagonal of a parallelogram bisects a pair of opposite angles, then the parallelogram is a rhombus.</i> • <i>that if the diagonals of a parallelogram are congruent, then the parallelogram is a rectangle.</i> • <i>that if a quadrilateral is a trapezoid, then the</i> - o <i>midsegment is parallel to the bases.</i> - o <i>length of the midsegment is half the sum of the lengths of the bases.</i> • <i>that if a quadrilateral is an isosceles trapezoid, then</i> - o <i>each pair of base angles is congruent.</i> - o <i>its diagonals are congruent.</i> • <i>that if a quadrilateral is a kite, then its diagonals are perpendicular.</i> • <i>the area formulas for rectangles, parallelograms, triangles, trapezoids, rhombuses, kites, and regular polygons.</i> • <i>the ratios for the perimeters and areas of similar figures.</i> • <i>the following theorems:</i> - o <i>Polygon Angle-Sum Theorem and its corollary</i> - o <i>Polygon Exterior Angle-Sum Theorem</i> <i><u>vocabulary:</u> equiangular polygon, equilateral polygon, regular polygon, consecutive angles, rectangle, rhombus, trapezoid, isosceles trapezoid, kite, coordinate proof, apothem</i>	
Content Area Literacy Standards		21st Century Skills
• RST.9-10.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. • RST.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to <i>grades 9-10 texts and topics</i>. • RST.9-10.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.		• <i>reason effectively</i> • <i>make judgements and decisions</i> • <i>solve problems</i> • <i>communicate clearly</i>

Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	PERFORMANCE TASK(S):
	OTHER EVIDENCE:

Stage 3 – Learning Plan

Summary of Key Learning Events and Instruction

<i>Language Arts Integration</i>	<i>Mathematics Integration</i>
1.OA.1 Use	1.OA.1 Use
<i>Technology Integration</i>	<i>District Materials</i>
1.OA.1 Use	