

Geometry: Grade 8

Stage 1 Desired Results		
ESTABLISHED GOALS: <u>Competencies:</u> - Students will demonstrate the ability to model with geometric formulas in order to solve problems involving two- and three-dimensional objects. - Students will demonstrate the ability to reason with the definitions and theorems of geometry in order to create conjectures and prove statements about congruence and similarity. - Students will demonstrate the ability to model real world problems by building and analyzing the appropriate expression, equation, or function. - 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> 8.G.A.1.A - Lines are taken to lines, and line segments to line segments of the same length. 8.G.A.1.B - Angles are taken to angles of the same measure. 8.G.A.1.C - Parallel lines are taken to parallel lines. 8.G.A. 2 - Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. 8.G.A.3 - Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. 8.G.A.4 - Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them. 8.G.A.5 - Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so. 8.G.C.9 - Know the formulas for the volumes of cones, cylinders, and	Transfer	
	Students will be able to independently use their learning to utilize spatial reasoning to manipulate and create objects and drawings.	
	Meaning	
	ENDURING UNDERSTANDINGS Students will understand that... - in order to justify a conclusion, evidence and reasoning must be provided. - purposeful manipulation can be used to meet the needs of a situation.	ESSENTIAL QUESTIONS What consequences can result from manipulation?
	Acquisition	
	Students will know... - that performing rotations, reflections, and translations on a geometric figure result in images congruent to the pre-images. - that dilations result in an image similar to the pre-image. - what effect a transformation has on a geometric figure. - how rigid transformations and dilations are the same and different. - that proportional reasoning can be used to solve problems related to similar and congruent figures. - that angle relationships are formed when parallel lines are cut by a transversal. - Volume of a cone: $V = \frac{1}{3}\pi r^2 h$ - Volume of a cylinder: $V = \pi r^2 h$ - Volume of a sphere: $V = \frac{4}{3}\pi r^2$ <u>vocabulary:</u> congruent figures, similar figures, corresponding, pre-image, image, line of reflection, rigid motion, rotation, center of rotation, transformation, translation, vertex, dilations, scale factor, indirect measure, alternate interior angles, alternate exterior angles, converse, corresponding	Students will be skilled at... - utilizing a compass, protractor, and ruler to create transformations of geometric lines and figures. - describing the effect of a transformation on a pre-image (original) and image. - comparing angles, line segments, and parallel lines of a pre-image and image. - identify a transformation from one image to another. - using technology (i.e. Gizmo or Geogebra) to construct rigid transformations to prove geometric properties. - performing dilations, rotations, reflections, and translations on geometric figures. - identifying the scale factor of a dilation. - proving similarity between figures in a dilation. - writing proportions to model a real world problem. - constructing two parallel lines with a transversal to identify alternate interior, exterior, corresponding, vertical, and adjacent angles. - measuring missing angles in a transversal. - describing the relationships between angles. - constructing a proof for a geometric argument. - proving that the interior angles of a triangle add up to 180 degrees.

spheres and use them to solve real-world and mathematical problems. • MP1 Make sense of problems and persevere in solving them. • 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.	<i>angles, equiangular, interior angles, remote interior angles, exterior angles, parallel, transversal, deductive reasoning, inductive reasoning, proof, theorem, legs, hypotenuse, diagonal, converse, inverse relationship, perfect squares, square root, distance formula, cone, cylinder, sphere, slant height, composite solids, hemisphere, similar solids, polyhedron, lateral area</i>	• <i>using geometric attributes to represent and compare objects.</i> • <i>applying appropriate formulas for volumes of cones, cylinders, and spheres to solve real-world and mathematical problems.</i> • <i>comparing and contrasting characteristics of cones, cylinders, and spheres and their formulas.</i>
Content Area Literacy Standards		21st Century Skills
• RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. • RST.6-8.4 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 6-8 texts and topics</i>. • RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually.		• <i>reason effectively</i> • <i>use systems thinking</i> • <i>solve problems</i> • <i>communicate clearly</i> • <i>access and evaluate information</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	
Language Arts Integration	Mathematics Integration
• 1.OA.1 Use	• 1.OA.1 Use

<i>Technology Integration</i>	<i>District Materials</i>
• 1.OA.1 Use	