

Accelerated GSE Geometry B / Algebra 2

2016-
2017

TCSS Unit Three Information

Georgia Milestones Domain & Weight: Circles 15%, Measurement 35%

Curriculum Map: *Geometric and Algebraic Connections*

Content Descriptors:

- Concept 1: Translate between the geometric description and the equation for a conic section
- Concept 2: Use coordinates to prove simple geometric theorems algebraically
- Concept 3: Apply geometric concept in modeling situations

Content from Frameworks: [Geometric and Algebraic Connections](#)

Unit Length: Approximately 12 days

[Georgia Milestones Study Guide for Geometric & Algebraic Connections](#)

TCSS Unit 3 – Accelerated GSE Geometry B/Algebra 2

	<p>equation of a line parallel or perpendicular to a given line that passes through a given point).</p> <p>MGSE9-12.G.GPE.6 Find the point on a directed line segment between two given points that partitions the segment in a given ratio.</p> <p>MGSE9-12.G.GPE.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.</p>	<p>MGSE9-12.G.MG.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).</p>
<p>Concept 1 Lesson Essential Question</p>	<p>Concept 2 Lesson Essential Question</p>	<p>Concept 3 Lesson Essential Question</p>
<p>How can I use the Pythagorean Theorem to derive the equation of a circle? How are the graph of a circle and its equation related? How are the equation of a circle and its graph related? How can I write the equation of a circle given information about the center and radius?</p>	<p>How can I prove properties of geometric figures algebraically? How can a line be partitioned? How can the distance between two points be determined? How are the slopes of lines used to determine if the lines are parallel, perpendicular, or neither? How do we write the equation of a line that goes through a given point and parallel or perpendicular to another line? How can slope and distance formula be used to determine properties and classify polygons and circles?</p>	<p>How can I minimize cost and maximize the volume of a topless box? How can I apply what I have learned about coordinate geometry to a real-world situation?</p>
<p>Concept 1 Vocabulary</p>	<p>Concept 2 Vocabulary</p>	<p>Concept 3 Vocabulary</p>
<p>Completing the Square Center of a Circle Standard Form of a Circle General Form of a Circle Diameter Radius Pythagorean Theorem</p>	<p>Coordinates</p>	<p>Model Density</p>
<p>Concept 1 Sample Assessment Items</p>	<p>Concept 2 Sample Assessment Items</p>	<p>Concept 3 Sample Assessment Items</p>

TCSS Unit 3 – Accelerated GSE Geometry B/Algebra 2

MGSE9-12.G.GPE.1

Write an equation for a circle with a radius of 2 units and center at (1, 3). $x^2 + 2x + y^2 - 6y = -6$

Find the center and radius of the circle $x^2 + y^2 - 2x + 8y = -8$

Center (1, -4) Radius = 3

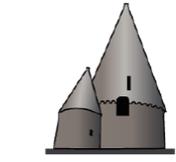
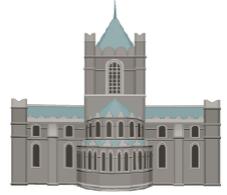
MGSE9-12.G.GPE.4

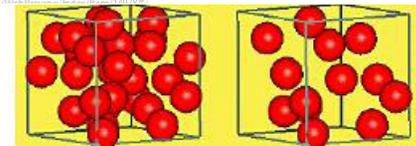
Prove that circle A, centered at the origin, passes through (-3, 4).

Using the distance formula or Pythagorean Theorem, conclude that the circle, $x^2 + y^2 = 25$, passes through the coordinate (-3, 4)

MGSE9-12.G.MG.1

Match each building with the geometric shapes that can be used to model it.

	Cone	Cylinder	Pyramid	Rectangular Prism
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Block I
Mass = 79.4 grams
Volume = 29.8 cubic cm

Block II
Mass = 25.4 grams
Volume = 29.8 cubic cm

MGSE9-12.G.MG.3

Trees that are cut down and stripped of their branches for timber are approximately cylindrical. A timber company specializes in a certain type of tree that has a typical diameter of 50 cm and a typical height of about 10 meters. The density of the wood is 380 kilograms per cubic meter, and the wood can be sold by mass at a rate of \$4.75 per kilogram. Determine and state the minimum number of whole trees that must be sold to raise at least \$50,000.

Volume of one tree

$$V = \pi r^2 h$$

$$V = \pi(0.25)^2(10)$$

$$V = 0.625\pi$$

Weight of one tree (x)

$$\frac{380 \text{ K}}{1 \text{ m}^3} = \frac{x}{0.625\pi}$$

$$x = 746.1282552 \text{ K}$$

Whole trees needed (n)

$$n = \frac{50,000}{(4.75)(746.1282552)}$$

$$n = 14.10791739$$

15 whole trees

TCSS Unit 3 – Accelerated GSE Geometry B/Algebra 2

Resources – Concept 1 Solving	Resources – Concept 2 Graphing	Resources – Concept 3 Modeling
<ul style="list-style-type: none"> ❖ Instructional Strategies and Common Misconceptions ❖ Writing the equation of a circle worksheet (G.GPE.1) ❖ Introduction to Conics ❖ Circles practice worksheet (G.GPE.1) #1 #2 ❖ What is a circle? Visual notes and practice KEY <p style="text-align: center;"><i>These tasks were taken from the GSE Frameworks.</i></p> <ul style="list-style-type: none"> ✓ Equations of Circles 1 FAL (G.GPE.1) ✓ Equations of Circles 2 FAL (G.GPE.1) – extension activity ✓ Converting Standard form to general form (G.GPE.1) – teacher notes/student guided practice ✓ Completing the Square in a circle (G.GPE.1) – teacher notes/student guided practice ✓ Graphing Circles on a graphing calculator (G.GPE.1) - highly recommended for practicing graphing calculator skills TE SE 	<ul style="list-style-type: none"> ❖ Instructional Strategies and Common Misconceptions ❖ Basic Circle Review ❖ Practice problems for circles <p style="text-align: center;"><i>These tasks were taken from the GSE Frameworks.</i></p> <ul style="list-style-type: none"> ✓ Algebraic Proof (G.GPE.4) Teacher Student ✓ Graphic Organizer – Partitioning a Directed Line Segment ✓ Distance Formula Applet ✓ Compare/Contrast – Two methods for Finding Distance ✓ Analyzing a Pentagon (GPE.4) ✓ New York City Task (GPE.6) TE SE ✓ Slopes of Special Pairs of Lines (GPE.5) TE SE ✓ Equations of Parallel & Perpendicular Lines FAL (GPE.4-7) ✓ Square Task (GPE.4-7) 	<p style="text-align: center;"><i>These tasks were taken from the GSE Frameworks.</i></p> <ul style="list-style-type: none"> ✓ A Day at the Beach Performance Task (application problems) ✓ Maximize Volume TE SE ✓ Extension Problem – How many cells?

TCSS Unit 3 – Accelerated GSE Geometry B/Algebra 2

<p style="text-align: center;"><u><i>Textbook Resources</i></u></p> <ul style="list-style-type: none"> Holt McDougal – Explorations in Core Math pages 397 – 406 (G.GPE.1) 	<ul style="list-style-type: none"> ✓ Euler’s Village (culminating task) TE SE ✓ 2D Representations of 3D objects FAL (G.GPE.1,2 & 4) – extension activity <p style="text-align: center;"><u><i>Textbook Resources</i></u></p> <ul style="list-style-type: none"> Holt McDougal – Explorations in Core Math pages 391 - 396 	
<p>Concept 1 <i>Differentiated Activities</i></p>	<p>Concept 2 <i>Differentiated Activities</i></p>	<p>Concept 3 <i>Differentiated Activities</i></p>
<ul style="list-style-type: none"> ❖ Circle Relay Cards Set A Set B Set C <i>These tasks were taken from the <u>GSE Frameworks.</u></i> ✓ Deriving the general equation of a circle (G.GPE.1) – highly recommended Teacher Student 	<ul style="list-style-type: none"> ❖ Exploring the Equation of a Circle 	<ul style="list-style-type: none"> ❖ Rolling Cups (3 Act video & FAL)
<p>Concept 1 <i>Resources recommended for Math Support</i></p>	<p>Concept 2 <i>Resources recommended for Math Support</i></p>	<p>Concept 3 <i>Resources recommended for Math Support</i></p>
<ul style="list-style-type: none"> ❖ Interactive Vocabulary Site (differentiate how vocabulary is presented) ❖ Completing the Square practice (G.GPE.1) <i>These tasks were taken from the <u>GSE Frameworks.</u></i> ❖ Ratio Station Task (G.GPE.1) Teacher Student 	<ul style="list-style-type: none"> ❖ Investigative Circle Activity Using Three Points 	<ul style="list-style-type: none"> ❖ Shapes in the real world

TCSS Unit 3 – Accelerated GSE Geometry B/Algebra 2

❖ Completing the square practice (G.GPE.1)		
---	--	--

At the end of Unit 3 student's should be able to say "I can..."

- ✓ Find the point that partitions a directed segment into a given ratio.
- ✓ Determine if a given pair of lines are parallel, perpendicular, or neither.
- ✓ Determine the equation of the line parallel or perpendicular to a given line and passing through a given point.
- ✓ Use distance and slope concepts to prove geometric theorems algebraically.
- ✓ Find perimeter of polygons and area of triangles and quadrilaterals.
- ✓ Write the equation for a circle given information such as a center, radius, point on the circle, etc.
- ✓ Prove simple geometric properties using coordinates

