Unit 6a: The Unit Circle		
Geometric & Spatial Reasoning (GSR) G.GSR.7: Explore the concept of a radian measure and special right triangles. (GaDOE, 2022b, p. 13)		
STANDARD &	LT & SC	
Expectations	Lesson Activities & Resources	
G.GSR.7.1 Explore and interpret a radian as the ratio of the arc length to the radius of a circle.	 LT: I am learning about radian measures of angles. I am learning about the ratio of arc length to the radius of a circle. SC: I understand the relationship between the radius of a circle, an arc length, and the associated radian measure. 	
	 LA&R: o Desmos and 3-Act Tasks; GeoGebra; Look for a great hands-on and technology visualization activity for this skill; Quizlet vocabulary & word wall; Flipped classroom <u>activity for Pi</u> 	
G.GSR.7.2 Explore and explain the relationship between radian measures and degree measures and convert fluently between	 LT: o I am learning about the relationship between radian and degree measures. o I am learning to convert between radian and degree measures of angles. 	
degree and radian measures.	 SC: I can convert between degree and radian measures to solve real-life problems. 	
	 LA&R: o Desmos and 3-Act Tasks; GeoGebra; IXL; Use the degrees off the Unit Circle to convert each degree to a radian to practice the skill, then check with a finished Unit Circle; Quizlet vocabulary & word wall. 	
G.GSR.7.3 Use special right triangles on the unit circle to determine the values of sine, cosine, and tangent	 LT: I am learning about special right triangles. I am learning how special right triangles determine the sine, cosine, and tangent values on the unit circle. I am learning about reference angles. 	

for $30^{\circ}\left(\frac{\pi}{6}\right)$, $45^{\circ}\left(\frac{\pi}{4}\right)$	o I am learning to identify coordinate values in all four quadrants of the coordinate plane
, and $60^{\circ} \left(\frac{\pi}{3}\right)$ angle	
measures. Use reflections of triangles to determine reference angles and identify coordinate values in all four quadrants of the coordinate plane.	 SC: I can use Special Right Triangles to find the values of sine, cosine, and tangent for 30° (π/6), 45° (π/4), and 60° (π/3) angle measures. I can articulate the pattern associated with angle measures in all four quadrants of the Unit Circle. (Students will be using reference angles as degrees in this skill). I can use reflections of triangles to determine reference angles. I can identify coordinate values in all four quadrants of the coordinate plane. I can measure the arc length of a circle using radians, converted from degrees.
	o I know that the Unit Circle has a radius equal to 1.
	 LA&R: Desmos and 3-Act Tasks; GeoGebra; Teach & practice Special Right Triangles using the <u>SAT formula sheet</u> as a guide; Teach reference angles (as degrees); Build Unit Circle paper plates; Use Special Right Triangles to find the coordinates of the ordered pairs on the Unit Circle; Practice ways to memorize the degrees, radians and ordered pairs on a Unit Circle; Arc length; Quizlet vocabulary & word wall

Unit 6b: Circles		
Geometric & Spatial Reasoning (GSR)		
G.GSR.8: Examine and apply theorems involving circles; describe and derive arc length and		
area of a sector; and model and explain real-life frameworks involving circles.		
STANDARD &	LT & SC	
Expectations	Lesson Activities & Resources	
G.GSR.8.1	LT:	
Identify and apply	o I am learning circle vocabulary.	
angle relationships	o I am learning about angle relationships in circles.	
formed by chords,		
tangents, secants, and		
radii with circles.	SC:	
	o I can identify and apply angle relationships formed by chords,	
	tangents, secants, and radii with circles.	

	 I can identify angles based on the location of the vertex: central, inscribed, interior, and exterior. I can identify perpendicular segments when a radius and tangent segment meet at a point of tangency on a circle. I can solve problems involving triangles inscribed in and circumscribed about circles. I can solve problems involving opposite angles of a quadrilateral inscribed in a circle, which are supplementary.
	 Desmos and 3-Act Tasks; GeoGebra; Discovery Learning using a circle where every 10 degrees is marked; IXL; DeltaMath; Quizlet Vocab (lots of words – may need two separate sets to manage student learning); Word wall; KutaSoftware
G.GSR.8.2 Using similarity, derive the fact that the length of the arc (arc length) intercepted by an angle is proportional	 LT: o I am learning about arc length in a circle. o I am learning about the area of a sector in a circle. o I am learning to use the arc length and area of a circle to solve circle application problems.
to the radius; derive the formula for the area of a sector. Solve mathematically applicable problems involving applications of arc length and area of sector.	 SC: o I understand that arc length intercepted by an angle is proportional to the radius. o I can solve application problems involving arc length and area of a sector.
	 LA&R: o Desmos and 3-Act Tasks; GeoGebra; Show arc length is measuring a distance in a linear unit using a Unit Circle paper plate & string; Show the difference between the arc length & area of a sector formulas: Degrees (proportions) & Radians (derive then show how to use). Arc Length & Area of Sector practice; Quizlet vocabulary & word wall.
G.GSR.8.3 Write and graph the equation of circles in standard form.	LT: o I am learning to write and graph circles in standard form. Terminology:
	General Form is $x^2 + y^2 + Cx + Dy + E = 0$ Standard Form is $(x - h)^2 + (y - k)^2 = r^2$

SC:
o I can identify the center and radius of a circle from an equation in standard form.
o I can identify the center and radius of a circle from the graph of a circle.
o I can write the equation of a circle in standard form given the graph of the circle.
o I can graph a circle from the standard form equation of a circle.
o I can use methods like completing the square to take the equation of a circle from general form to standard form. (Note: The leading coefficient of the quadratic terms should be limited to 1.) (What course will students learn completing the square?)
LA&R:
 Desmos and 3-Act Tasks; GeoGebra; TI-nSpire CAS calculator – students do the math then use the graphing calc to check that both forms graph the same circle. <u>Desmos online graphing calculator</u>; Quizlet vocabulary & word wall.