Unit F - *Circles*

Overview

During this unit students use many concepts learned throughout the course to solve problems involving circles. Segments and angles associated with circles are examined. Problems on the coordinate plane again bridge Algebra and Geometry. Proofs are not done in this unit.

21st Century Capacities: Analyzing, Synthesizing

Stage 1 - Desired Results

ESTABLISHED GOALS/ STANDARDS

MP 1 Make sense of problems and persevere in solving them
MP2 Reason abstractly and quantitatively
MP7 Look for and make use of structure

CCSS.MATH.CONTENT.HSG.CO.A.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.

CCSS.MATH.CONTENT.HSG.C.A.1
Prove that all circles are similar.

CCSS.MATH.CONTENT.HSG.C.A.2
Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a*

Transfer:

Students will be able to independently use their learning in new situations to...

1. Draw conclusions about graphs, shapes, equations, or objects. (Synthesizing)
2. Demonstrate fluency with math facts, computation and concepts.
3. Make sense of a problem, initiate a plan, execute it, and evaluate the reasonableness of the solution. (Analyzing)

Meaning:

UNDERSTANDINGS: *Students will understand that:*	ESSENTIAL QUESTIONS: *Students will explore & address these recurring questions:*
1. Mathematicians flexibly use different tools, strategies, symbols, and operations to build conceptual knowledge or solve problems. 2. Mathematicians examine relationships to discern a pattern, generalizations, or structure. 3. Mathematicians analyze characteristics and properties of geometric shapes to develop mathematical arguments about geometric relationships.	A. What math tools/models/strategies can I use to solve the problem? B. Does this solution make sense? C. How does classifying bring clarity?

diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle. CCSS.MATH.CONTENT.HSG.C.B.5 Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector. CCSS.MATH.CONTENT.HSG.GPE.A.1 Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	*Acquisition:*	
	Students will know…	*Students will be skilled at…*
	1. How to identify a major or minor arc 2. The formula for the area and circumference of a circle 3. If a radius is perp to a chord, then it bisects the chord (and the converse) 4. The perp. bisector of a chord passes through the center of the circle 5. If 2 chords are equidistant from the center of a circle, then they are congruent (and converse) 6. The standard form of the equation of a circle and how changing its parameters changes the circle 7. The difference between the measure and the length of an arc 8. The relationship between a radius and a tangent that meet on a circle (perpendicular) 9. Opposite angles of inscribed quadrilaterals are supplements 10. Vocabulary: sector, circle, center, radius, concentric, interior, exterior, diameter, chord, arc, central angle, minor arc, major arc, semicircle, secant, tangent, point of tangency, central angles, inscribed angles, inscribed, circumscribed, circumcenter, incenter	1. Identifying where a point is located: in the interior, exterior, or on the circle 2. Identifying chords, radii, diameters, tangents of circles 3. Applying circle area and circumference formulas to find the area of a sector or length of an arc 4. Graphing circles from an equation and writing an equation of a graphed circle 5. Solving a wide variety of problems involving circles, and associated lines, segments and angles 6. Finding the measure of the intercepted arc of inscribed and central angles 7. Solving problems involving circumscribed and inscribed polygons