Geometry CP Unit 9: Circles

Unit #:	APSDO-00018039	Duration:	3.0 Week(s)	Date(s):	

Team:
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Grades:
9, 10
Subjects:
Mathematics

Unit Focus

In this unit, students will investigate lines, segments, and angle properties of circles and use these properties to solve problems. The will also use inequality properties of circles and use the radii to compare the ratios of areas and volumes. In addition, students will apply properties of rotations and reflections to circles. Summative assessments may include projects, labs, and tests. Primary instructional materials include Glencoe Geometry Integration, Application, and Connections, 1998.

Stage 1: Desired Results - Key Understandings

Established Goals

Common Core
Mathematics: 9

- 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.CO.A.1*
- Prove that all circles are similar. *CCSS.MATH.CONTENT.HSG.C.A.1*
- Identify and describe relationships among inscribed angles, radii, and chords. *CCSS.MATH.CONTENT.HSG.C.A.2*
- Construct the inscribed and

Transfer

T1 (T50) Based on an understanding of any problem, initiate a plan, execute it and evaluate the reasonableness of the solution.
T2 (T53) Articulate how mathematical concepts relate to one another in the context of a problem or in the theoretical sense.
T3 (T51) Examine alternate methods to accurately and efficiently solve problems.
T4 (T52) Use appropriate tools strategically to deepen understanding of mathematical concepts.
T5 (T40) Describe, classify, and compare objects by their attributes.
T6 (T43) Infer the relationship between objects based on their shape, location, and measurements.
T7 (T44) Apply appropriate theorems and formulas to determine the unknown.

Meaning

Understandings	Essential Questions

circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle. *CCSS.MATH.CONTENT.HSG.C.A.3*
- Construct a tangent line from a point outside a given circle to the circle. *CCSS.MATH.CONTENT.HSG.C.A.4*
- Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. *CCSS.MATH.CONTENT.HSG.CO.A.4*
- 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.C.B.5*
- Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another. *CCSS.MATH.CONTENT.HSG.CO.A.5*
- Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent. *CCSS.MATH.CONTENT.HSG.CO.B.6*
- Look for and make use of structure. *CCSS.MATH.MP.7*
- Reason abstractly and quantitatively. *CCSS.MATH.MP.2*

U1 (U406) Every geometric theorem or formula is an established relationship that can be applied to a specific set of figures.
U2 (U510) Every problem is a member of a category of problems that has a similar structure and set of characteristics.
U3 (U560) Patterns and structures are characterized by consistent relationships.

Q1 (Q405) How do I use measurements about the shape to calculate additional information about it?
Q2 (Q406) What is the theorem/formula necessary to solve this problem? (Gr. 5-12)
Q3 (Q511) What characteristics/attributes define this type of problem?
Q4 (Q512) What information is needed and how do I use it to solve a problem?
Q5 (Q561) How does understanding the pattern/structure help me solve the problem?

Acquisition of Knowledge and Skill

Knowledge

Skills

S1

Define and apply line and segment relationships in a circle

S2

Define and apply line and angle relationships in a circle

S3

Apply circle inequality properties

S4

Draw and identify reflected figures

S5

Describe relationships between rotations and reflections (i.e., identify a rotation as two reflections over intersecting lines)

Stage 3: Learning Plan

Coding	Code	Description of Learning Activity