

Understand and apply theorems about circles (Standards G.C.1-4)	
<b>Standard II.G.C.1:</b> Prove that all circles are similar.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> <li>Recognize that any two circles are related by a dilation, possibly along with a translation.</li> <li>Write up a formal argument explaining their reasoning for why two circles must be similar.</li> </ul>	
Related Standards: Current Course	Related Standards: Future Courses
<a href="#">II.G.C.2</a> ; <a href="#">II.G.C.5</a> ; <a href="#">II.G.SRT.1</a> ; <a href="#">II.G.SRT.2</a> ; <a href="#">II.G.SRT.5</a> ; <a href="#">II.G.GPE.1</a> ; <a href="#">II.G.GPE.4</a>	<a href="#">III.F.TF.1</a> ; <a href="#">III.G.MG.1</a> ; <a href="#">III.G.MG.3</a> ;

## Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> <li>Correctly name shapes (<a href="#">K.G.2</a>)</li> <li>Know the area and circumference of a circle (<a href="#">7.G.4</a>)</li> <li>Know precise definition of circle (<a href="#">I.G.CO.1</a>)</li> </ul>
Academic Vocabulary
Resources
<a href="https://www.uen.org/core/core.do?courseNum=5620#71552">Curriculum Resources</a> : <a href="https://www.uen.org/core/core.do?courseNum=5620#71552">https://www.uen.org/core/core.do?courseNum=5620#71552</a>

Understand and apply theorems about circles (Standards G.C.1-4)	
<b>Standard II.G.C.2:</b> Identify and describe relationships among inscribed angles, radii, and chords. <i>Relationships include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.</i>	
Concepts and Skills to Master	
<ul style="list-style-type: none"> <li>• Explore various properties related to circles (include measures of central, inscribed and circumscribed angles)</li> <li>• Form conjectures about the relationships they find.</li> <li>• Develop justifications for why their conjectures work.</li> </ul>	
Related Standards: Current Course	Related Standards: Future Courses
<a href="#">II.G.C.1</a> ; <a href="#">II.G.C.3</a> ; <a href="#">II.G.C.4</a> ; <a href="#">II.G.C.5</a> ; <a href="#">II.G.GPE.1</a> ; <a href="#">II.G.GPE.4</a> , <a href="#">II.G.CO.9</a> , <a href="#">II.G.CO.10</a> , <a href="#">II.G.CO.11</a>	<a href="#">III.G.MG.1</a> ; <a href="#">III.G.MG.3</a>

## Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> <li>• Correctly name shapes (<a href="#">K.G.2</a>)</li> <li>• Draw points, lines, line segments, ray, angles, and parallel and perpendicular lines. Identify these in two-dimensional figures. (<a href="#">4.G.1</a>)</li> <li>• Know the area and circumference of a circle (<a href="#">7.G.4</a>)</li> <li>• Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment (<a href="#">1.G.CO.1</a>)</li> </ul>
Academic Vocabulary
inscribed angle, central angle, circumscribed angle, chord, tangent line
Resources
<a href="https://www.uen.org/core/core.do?courseNum=5620#71552">Curriculum Resources</a> : <a href="https://www.uen.org/core/core.do?courseNum=5620#71552">https://www.uen.org/core/core.do?courseNum=5620#71552</a>

Understand and apply theorems about circles (Standards G.C.1-4)	
<b>Standard G.C.3:</b> Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> <li>• Inscribe a circle in a triangle.</li> <li>• Circumscribe a circle about a triangle.</li> <li>• Prove that opposite angles in a quadrilateral inscribed in a circle are supplementary.</li> <li>• Identify how to find the incenter and circumcenter of a triangle.</li> <li>• Use the incenter and circumcenter to construct the incircle and circumcircle of a triangle.</li> <li>• Recognize that the opposite angles of a quadrilateral inscribed in a circle are supplementary, and justify why that is the case.</li> </ul>	
Related Standards: Current Course	Related Standards: Future Courses
<a href="#">G.CO.C</a> , <a href="#">G.CO.12</a>	

## Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> <li>• Use a variety of construction methods.</li> <li>• Know the relationship between an inscribed angle and its intercepted arc (<a href="#">II.6.G.C.2</a>).</li> </ul>
Academic Vocabulary
inscribed, circumscribed, angle quadrilateral
Resources
Curriculum Resources: <a href="http://schools.utah.gov/curr/mathsec/Core/HighSchoolCurriculum.aspx">http://schools.utah.gov/curr/mathsec/Core/HighSchoolCurriculum.aspx</a>

Understand and apply theorems about circles (Standards G.C.1-4)	
<b>Standard G.C.4:</b> Construct a tangent line from a point outside a given circle to the circle.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> <li>• Construct a line from a point tangent to a point on the circle.</li> <li>• Think about properties they know about circles and how they could help them find the tangent line.</li> <li>• Write a clear description for how to construct a tangent line.</li> <li>• Provide a justification for why the construction using properties of circles.</li> </ul>	
Related Standards: Current Course	Related Standards: Future Courses
<a href="#">G.CO.12</a> , <a href="#">G.GMD.1</a>	

## Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> <li>• Use a variety of construction techniques.</li> </ul>
Academic Vocabulary
tangent, circle
Resources
Curriculum Resources: <a href="http://schools.utah.gov/curr/mathsec/Core/HighSchoolCurriculum.aspx">http://schools.utah.gov/curr/mathsec/Core/HighSchoolCurriculum.aspx</a>

Find arc lengths and areas of sectors of circles. Use this as a basis for introducing the radian as a unit of measure. It is not intended that it be applied to the development of circular trigonometry in this course (Standards G.C.5)

**Standard II.G.C.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.

#### Concepts and Skills to Master

- Use the concept of similarity to understand that arc length intercepted by a central angle is proportional to the radius.
- Develop the definition of radians as a unit of measure by relating to arc length.
- Discover that the measure of the central angle in radians is the constant of proportionality.
- Derive the formula for the area of a sector.
- Relate the length and area of sectors to the fraction of the circle cut off by the corresponding central angle.
- Develop and use general formulas for arc length and sector area.
- Recognize radian as an alternative method to define the measure of an angle based on the arc it cuts off.

#### Related Standards: Current Course

[F.TF.1](#), [F.TF.2](#)

#### Related Standards: Future Courses

### Support for Teachers

#### Critical Background Knowledge

- Understand similarity ([II.GRT](#)).
- Calculate circumference and area of a circle. ([7.G.4](#))

#### Academic Vocabulary

sector, arc length, constant of proportionality, radian, circumference, area

#### Resources

Curriculum Resources: <http://schools.utah.gov/curr/mathsec/Core/HighSchoolCurriculum.aspx>