



# Northside High School

## Geometry Curriculum

### Unit 9: Circles

Unit Length: 23 days

#### Domain: Circles

- Cluster 10: Understand and apply theorems about circles.
- Cluster 11: Find arc lengths and areas of sectors of circles.

#### Domain: Congruence

- Cluster 4: Make geometric constructions.

#### Domain: Expressing Geometric Properties with Equations

- Cluster 12: Translate between the geometric description and the equation of a conic section.

#### Standards:

- HSG.C.A.1:
  - Prove that all circles are similar.
- \*HSG.C.A.2:
  - Identify, describe, and use relationships among angles, radii, segments, lines, arcs, and chords as related to circles.
  - Note: Examples include but are not limited to the following: the relationship between central, inscribed, and circumscribed angles and their intercepted arcs; angles inscribed in a semi-circle are right angles; the radius of a circle is perpendicular to a tangent line of the circle at the point of tangency.
- HSG.C.A.3:
  - Construct the inscribed and circumscribed circles of a triangle.
  - Prove properties of angles for a quadrilateral inscribed in a circle.
- \*HSG.C.B.5:
  - Derive using similarity that the length of the arc intercepted by an angle is proportional to the radius.
  - Derive and use the formula for the area of a sector.
  - Understand the radian measure of the angle as a unit of measure.
- HSG.CO.D.13:
  - Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.



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- \*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.
    - Note: Students should also be able to identify the center and radius when given the equation of a circle and write the equation given a center and radius.
- HSG.CO.E.14:
  - Apply inductive reasoning and deductive reasoning for making predictions based on real world situations using:
    - Conditional Statements (inverse, converse, and contrapositive).
    - Venn Diagrams.
      - Note: This is not intended to be an isolated topic but instead to support concepts throughout the course.

*\*Guaranteed Viable Curriculum*

### Vocabulary to Emphasize:

- Circle.
- Center.
- Radius.
- Diameter.
- Circumference.
- Arc.
- Minor Arc.
- Major Arc.
- Arc Length.
- Arc Measure.
- Sector.
- Sector Area.
- Inscribed Angle.
- Central Angle.
- Chord.
- Secant.
- Tangent.
- Semicircle.



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## Geometry Curriculum

### Unit 9: Part 1: Equations of Circles, Sector Area, Arc Length

5 days

(This part of the unit will occur **before** the Aspire Review and Aspire Testing)

Essential question: How does Geometry apply to circles in the coordinate plane?

Learning Goal	Notes	Bellwork/Exit	Practice
Students will be able to Write equations of Circles and graph them in the coordinate plane.	Equations of Circles Notes and Practice.  Pre-AP: <ul style="list-style-type: none"><li>Notes.</li><li>Practice.</li></ul>	<b>BW:</b> <ul style="list-style-type: none"><li>Equations of Circles BW #1.</li></ul> <b>Pre-AP bellwork:</b> <ul style="list-style-type: none"><li>Derive the Equation of a Circle.</li></ul> <b>Exit:</b> <ul style="list-style-type: none"><li>Circles Odd One Out.</li></ul>	<b>Pre-AP Homework:</b> <ul style="list-style-type: none"><li>Equations of Circles Practice.*</li></ul> <small>*resource adapted from Holt Geometry worksheets</small>
Students will be able to Write equations of Circles and graph them in the coordinate plane.		<b>BW:</b> <ul style="list-style-type: none"><li>Equations of Circles BW #2.</li></ul>	Equations of Circles Practice.* <small>*resource adapted from Holt Geometry worksheets</small> <b>Pre-AP:</b> <ul style="list-style-type: none"><li>Do “Equations of Circles Math Libs” found below.</li></ul>
Students will be able to Write equations of Circles and graph them in the coordinate plane.	<b>Pre-AP:</b> <ul style="list-style-type: none"><li>Use algebra tiles to demonstrate completing the square.</li><li>Completing the Square Notes.</li></ul>	<b>BW:</b> <ul style="list-style-type: none"><li>Equations of Circles BW #3.</li></ul>	Equations of Circles Math Libs. <b>Pre-AP:</b> <ul style="list-style-type: none"><li>Completing the Square practice.*</li></ul> <small>*Resource found at: <a href="https://cdn.kutasoftware.com/Worksheets/Alg2/Equations%20of%20Circles.pdf">https://cdn.kutasoftware.com/Worksheets/Alg2/Equations%20of%20Circles.pdf</a></small>



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<b>Students will be able to Calculate Sector Area and Arc Length.</b>	Arc Length & Sector Area Graphic Organizer.*  Arc Length & Sector Area Foldable.* *resources from <a href="http://newellssecondarymath.blogspot.com/2016/05/sector-area-and-arc-length.html">http://newellssecondarymath.blogspot.com/2016/05/sector-area-and-arc-length.html</a>	<b>BW:</b> <ul style="list-style-type: none"><li>• Circumference &amp; Area BW.</li></ul>	Arc Length & Sector Area Intro Examples.* *resource from <a href="http://newellssecondarymath.blogspot.com/2016/05/sectorarea-and-arc-length.html">http://newellssecondarymath.blogspot.com/2016/05/sectorarea-and-arc-length.html</a>
<b>Students will be able to Calculate Sector Area and Arc Length.</b>		<b>BW:</b> <ul style="list-style-type: none"><li>• Arc Length BW.</li></ul>	Arc Length & Sector Area Practice #1.

Unit 9 CFA #1, Version A.

Unit 9 CFA #1, Version B.



# Northside High School Geometry Curriculum

## Unit 9: Part 2: Lines & Segments in Circles

7 days

(This part of the unit will occur **after** the Aspire Review and Aspire Testing)

Essential question: How do lines & segments relate in circles?

Learning Goal	Notes	Bellwork/Exit	Practice
<b>Students will be able to recognize different parts of a circle.</b>	Circle Basics Foldable.* *resource from <a href="http://newellssecondarymath.blogspot.com/2016/04/circle-basics-unit-part-1.html">http://newellssecondarymath.blogspot.com/2016/04/circle-basics-unit-part-1.html</a>  <b>Pre-AP Notes:</b> <ul style="list-style-type: none"><li>Circle Theorems Discovery* (to be used throughout the unit.)</li></ul> *Resource found at: <a href="https://www.teacherspayteachers.com/Product/Discovering-Circle-Theorems-Guided-Inquiry-Reference-Pack-2004034">https://www.teacherspayteachers.com/Product/Discovering-Circle-Theorems-Guided-Inquiry-Reference-Pack-2004034</a>	<b>BW:</b> <ul style="list-style-type: none"><li>Pre-Assessment.</li></ul> <b>Exit:</b> <ul style="list-style-type: none"><li>Exit Question.</li></ul>	Circle Vocabulary Practice.* *resource adapted from Holt Geometry worksheets.
<b>Students will be able to apply properties of arcs and chords to solve for parts of a circle.</b>	Circles Vocab Review.* *resource from <a href="http://newellssecondarymath.blogspot.com/2016/04/circle-basics-unit-part-1.html">http://newellssecondarymath.blogspot.com/2016/04/circle-basics-unit-part-1.html</a>  Arcs & Chords Foldable.* (Skip #4 on notes) *resource from <a href="http://newellssecondarymath.blogspot.com/2016/05/arcs-and-chords.html">http://newellssecondarymath.blogspot.com/2016/05/arcs-and-chords.html</a>	<b>BW:</b> <ul style="list-style-type: none"><li>Circle Segment Vocab BW.</li></ul>	Arcs & Chords Practice.* *resource from <a href="http://newellssecondarymath.blogspot.com/2016/05/arcs-and-chords.html">http://newellssecondarymath.blogspot.com/2016/05/arcs-and-chords.html</a>
	Chords Review Notes.* *resource from <a href="http://newellssecondarymath.blogspot.com/2016/05/arcs-and-chords.html">http://newellssecondarymath.blogspot.com/2016/05/arcs-and-chords.html</a>	<b>BW:</b> <ul style="list-style-type: none"><li>Chords BW.</li></ul>	Arcs and Chords Kuta Practice.* *Resource from <a href="https://cdn.kutasoftware.com/Worksheets/Geo/11-Arcs%20and%20Chords.pdf">https://cdn.kutasoftware.com/Worksheets/Geo/11-Arcs%20and%20Chords.pdf</a>



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Learning Goal	Notes	Bellwork/Exit	Practice
Students will be able to apply properties of tangent lines to solve for parts of a circle.	Tangent Lines Foldable.* *resource from <a href="http://newellssecondarymath.blogspot.com/2016/04/circle-basics-unit-part-1.html">http://newellssecondarymath.blogspot.com/2016/04/circle-basics-unit-part-1.html</a>	<b>BW:</b> <ul style="list-style-type: none"><li>Chords BW #2.</li></ul>	Tangent Lines Practice.* *resource from <a href="http://newellssecondarymath.blogspot.com/2016/04/circle-basics-unit-part-1.html">http://newellssecondarymath.blogspot.com/2016/04/circle-basics-unit-part-1.html</a>
	Tangent Line Properties Review.* *resource from <a href="http://newellssecondarymath.blogspot.com/2016/04/circle-basics-unit-part-1.html">http://newellssecondarymath.blogspot.com/2016/04/circle-basics-unit-part-1.html</a>	<b>BW:</b> <ul style="list-style-type: none"><li>Chords BW #3.</li></ul>	Tangent Lines Worksheet.* *Resource adapted from Holt Geometry worksheets
Students will be able to apply properties of chords, secants, and tangents to solve for parts of a circle.	Chords, Secants and Tangents Notes Foldable.* *Resource adapted from Holt Geometry worksheets	<b>BW:</b> <ul style="list-style-type: none"><li>Tangent BW #1.</li></ul>	Chords, Secants and Tangents Worksheet.* *Resource adapted from Holt Geometry worksheets
		<b>BW:</b> <ul style="list-style-type: none"><li>Tangent BW #2.</li></ul>	Chords, Secants, and Tangents Worksheet #2.  <b>Pre-AP/Extension:</b> <ul style="list-style-type: none"><li>Explorations in Core Math Workbook Section 12-6.</li></ul>

Unit 9 CFA #2, Version A: Lines & Segments in Circles.

Unit 9 CFA #2, Version B: Lines & Segments in Circles.



# Northside High School

## Geometry Curriculum

### Unit 9: Part 3: Angles in Circles

7 days

(This part of the unit will occur after the Aspire Review and Aspire Testing)

Common Summative Assessment

Essential question: How do angles relate in circles?

Learning Goal	Notes	Bellwork/Exit	Practice
<b>Students will explore arc and angle measures in circles.</b>	Arcs & Central Angles Foldable.*  Arc Graphic Organizer.* *resources from <a href="http://newellssecondarymath.blogspot.com/2016/05/mtbos30-central-angles-and-arcs.html">http://newellssecondarymath.blogspot.com/2016/05/mtbos30-central-angles-and-arcs.html</a>	<b>BW:</b> <ul style="list-style-type: none"><li>Chords BW #4.</li></ul>	Arcs & Central Angle Practice.* *resource from <a href="http://newellssecondarymath.blogspot.com/2016/05/mtbos30-central-angles-and-arcs.html">http://newellssecondarymath.blogspot.com/2016/05/mtbos30-central-angles-and-arcs.html</a>
<b>Students will solve for central and inscribed angles using circle properties.</b>	Central & Inscribed Angle Notes.  <b>Pre-AP Notes:</b> <ul style="list-style-type: none"><li>Circle Theorems Discovery.* (to be used throughout the unit)</li></ul> *resource found at: <a href="https://www.teacherspayteachers.com/Product/Discovering-Circle-Theorems-Guided-Inquiry-Reference-Pack-2004034">https://www.teacherspayteachers.com/Product/Discovering-Circle-Theorems-Guided-Inquiry-Reference-Pack-2004034</a>	<b>BW:</b> <ul style="list-style-type: none"><li>Central Angles &amp; Arcs BW.</li></ul>	Central and Inscribed Angles Practice.* *Resource found at: <a href="http://www.letspracticegeometry.com/wp-content/uploads/2011/11/central-angles-and-inscribed-angles.pdf">http://www.letspracticegeometry.com/wp-content/uploads/2011/11/central-angles-and-inscribed-angles.pdf</a>



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Learning Goal	Notes	Bellwork/Exit	Practice
Students will solve for central and inscribed angles using circle properties.	Inscribed Angle Theorems.* *resource from <a href="http://newellssecondarymath.blogspot.com/2017/05/inscribed-angles.html">http://newellssecondarymath.blogspot.com/2017/05/inscribed-angles.html</a>	<b>BW:</b> <ul style="list-style-type: none"> <li>Central &amp; Inscribed Angle Algebra BW.</li> </ul>	Inscribed Angle Theorems Practice Foldable.* *resource from <a href="http://newellssecondarymath.blogspot.com/2017/05/inscribed-angles.html">http://newellssecondarymath.blogspot.com/2017/05/inscribed-angles.html</a>  <b>Pre-AP/Enrichment:</b> <ul style="list-style-type: none"> <li>Homework: Central and Inscribed Angles.*</li> </ul> *Resource found at: <a href="http://www.letspracticegeometry.com/wp-content/uploads/2011/11/central-angles-and-inscribed-angles.pdf">http://www.letspracticegeometry.com/wp-content/uploads/2011/11/central-angles-and-inscribed-angles.pdf</a>
Students will solve for missing angles formed by secant lines and chords.	Angle Relationships in Circles: Chords and Secants.* *resource adapted from Holt Geometry worksheets.	<b>BW:</b> <ul style="list-style-type: none"> <li>Inscribed Angle BW.</li> </ul>	Angle Relationships in Circles Worksheet.* *resource adapted from Holt Geometry worksheets.
Students will solve for missing angles formed by secant lines and chords.		<b>BW:</b> <ul style="list-style-type: none"> <li>Circle Angles BW.</li> </ul>	Secant Angles Kuta Practice.* *resource from <a href="https://cdn.kutasoftware.com/Worksheets/Geo/11-Secant%20Angles.pdf">https://cdn.kutasoftware.com/Worksheets/Geo/11-Secant%20Angles.pdf</a>
Students will be able to calculate Sector Area and Arc Length.	Review Arc Length & Sector Area Notes.	<b>BW:</b> <ul style="list-style-type: none"> <li>Arc Length &amp; Sector Area BW #1.</li> </ul>	Arc Length & Sector Area Practice #2.* *resource adapted from Holt Geometry worksheets.
Students will be able to calculate Sector Area and Arc Length.		<b>BW:</b> <ul style="list-style-type: none"> <li>Arc Length &amp; Sector Area BW #2.</li> </ul>	Arc Length & Sector Area Scavenger Hunt.

Unit 9 CFA #3, Version A: Angles in Circles.

Unit 9 CFA #3, Version B: Angles in Circles.





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## Geometry Curriculum

Three days of review before the test:

- Days 1-2 : Review Equations of Circles Notes, and do Equations of Circles Task Cards.\*
- Day 3: CSA Review.

\*See Mrs. Robison for task cards.

Pre-AP: Equations of Circles Maze.

Unit 9 Common Summative Assessment.

<b>Unit 9 previous learning: Where do I start/What should they know?</b>	
7.G.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
8.G.4	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional.
8.G.6	Explain a proof of the Pythagorean Theorem and its converse.
8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.