

MATH MCS MYP UNIT PLANNER

Teacher(s)	Echo Fritch	Subject group and discipline	Accelerated Geometry B/Algebra 2		
Unit title	Unit 2 Circles & Volume (GaDOE Accelerated Geo B/Alg II Unit 1)	MYP year	5	Unit duration (hrs)	15 hours (4 Weeks)

Inquiry: Establishing the purpose of the unit

Key concept	Related concept(s)	Global context
Relationships	Generalization Measurement Pattern	Orientation in space and time

Statement of inquiry

Generalizing patterns in the world can lead to recognizing broader relationships.

Inquiry questions

Factual—

What are the parts of a circle?

What are the properties of tangents?

What are the properties of chords in a circle?

What are the formulas for arc length and sector area?

What are the formulas for volume of a prism, cone, pyramid, cylinder, and sphere?

Conceptual—

How can we use the properties of chords to solve problems?

How is a tangent line related to the radius of a circle at the point of tangency?

How can we solve for angles and arcs by intersecting chords, tangents, and secants?

How can we solve for segment lengths formed by intersecting chords, tangents, and secants?

How is the measure of an inscribed angle related to its intercepted arc?

<p>How are the formulas for volume of a pyramid and volume of a cone alike?</p> <p>How does volume relate to a cross section parallel to the base of a three-dimensional figure?</p> <p>Debatable—</p> <p>Which geometric shape will fill a pail of sand the fastest?</p> <p>How can you use measure and geometric knowledge of circles to design space cities with specific parameters?</p>	
MYP Objectives	Assessments
<p>MYP Objective D: Applying Mathematics in Real Life</p> <p>Contexts: A Day at the Beach Performance Task</p>	<p>Common Unit Quiz</p> <p>Common Unit Tests</p> <ul style="list-style-type: none"> ● Test 1 - Circles ● Test 2 - Cumulative
Approaches to learning (ATL)	
<ul style="list-style-type: none"> • Make inferences and draw conclusions • Understand and use mathematical notation • Apply skills and knowledge in unfamiliar situations 	

Action: Teaching and learning through inquiry

Content Standards
<p><u>Understand and apply theorems about circles</u></p> <p>MGSE9-12.G.C.1 Understand that all circles are similar.</p> <p>MGSE9-12.G.C.2 Identify and describe relationships among inscribed angles, radii, chords, tangents, and secants. 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.</p> <p>MGSE9-12.G.C.3 Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.</p> <p>MGSE9-12.G.C.4 Construct a tangent line from a point outside a given circle to the circle.</p> <p><u>Find arc lengths and areas of sectors of circles</u></p> <p>MGSE9-12.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.</p> <p><u>Explain volume formulas and use them to solve problems</u></p> <p>MGSE9-12.G.GMD.1 Give informal arguments for geometric formulas.</p> <ol style="list-style-type: none"> a. Give informal arguments for the formulas of the circumference of a circle and area of a circle using dissection arguments and informal limit arguments. b. Give informal arguments for the formula of the volume of a cylinder, pyramid, and cone using Cavalieri’s principle. <p>MGSE9-12.G.GMD.2 Give an informal argument using Cavalieri’s principle for the formulas for the volume of a sphere and other solid figures.</p> <p>MGSE9-12.G.GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.</p> <p><u>Write expressions in equivalent forms to solve problems</u></p>

MGSE9-12.A.CED.4 Rearrange formulas to highlight a quantity of interest using the same reasoning as in solving equations. Examples: Rearrange Ohm’s law $V = IR$ to highlight resistance R ; Rearrange area of a circle formula $A = \pi r^2$ to highlight the radius r . Represent and solve equations

Learning Activities and Experiences

Topic	Resources	Content Addressed	Standards Addressed
Subunit – Circles 6 Days Quiz: Circles (Days 1 – 3); Test: Circles (Days 1 – 5)			
Lines and Line Segments with Circles	Parts of a Circle	<ul style="list-style-type: none"> Circle Vocabulary 	C.1
	10-2 Lines Tangent to a Circle Pearson enVision pg. 427 – 435	<ul style="list-style-type: none"> Tangents to a circle Properties of tangents Identify lines that are tangent to a circle using angle measures and segment lengths. Solve problems involving tangent lines. 	C.1 C.2
	10-3 Chords Pearson enVision pg. 436 – 443	<ul style="list-style-type: none"> Properties of Chords Prove and apply relationships between chords, arcs, and central angles. Find lengths of chords given the distance from the center of the circle and use this information to solve problems. Solve problems using properties of angles for a quadrilateral inscribed in a circle. 	C.2 C.3 C.4 C.5
	Additional Resources: Teacher Created Notes		
Angles related to Circles	10-4 Inscribed Angles Pearson enVision pg. 444 – 450	<ul style="list-style-type: none"> Identify and apply relationships between the measures of inscribed angles, arcs, and central angles. Identify and apply the relationships between an angle formed by a chord and a tangent to its intercepted arc. 	C.2
	10-5 Secant Lines and Segments Pearson enVision pg. 451 – 458	<ul style="list-style-type: none"> Recognize and apply angle relationships formed by secants and tangents intersecting inside and outside a circle. Recognize and apply segment length relationships formed by secants and tangents intersecting inside and outside a circle. Solve for angles and arcs formed by intersecting chords, tangents, and secants. 	C.2

	<p>Additional Resources:</p> <ul style="list-style-type: none"> Teacher Created Notes Pearson <p>3 Act Task Earth Watch Pearson enVision pg. 435</p> <p>STEM Mini-Project Design Space Cities Pearson enVision pg. 418</p>		
<p>Subunit – Volume, arc length/area of a sector</p> <p>4 Days</p> <p>Quiz: Arc Length and Area of Sector; Unit 1 Cumulative Test</p>			
Arcs and Sectors	<p>10-1 Arcs and Sectors</p> <p>Pearson enVision pg. 419 – 426</p> <p>Performance Task pg. 426</p>	<ul style="list-style-type: none"> Finding arc length and sector area of a circle 	GMD.1.a
	<p>Additional Resources:</p> <p>Teacher Created Notes:</p>		
3-Dimensional Figures	<p>11.2 Volumes of Prisms and Cylinders</p> <p>Pearson enVision pg. 470 – 478</p>	<ul style="list-style-type: none"> Understand how the volume formulas for prisms and cylinders apply to oblique prisms and cylinders. Model three-dimensional figures as cylinders and prisms to solve problems. 	GMD.3
	<p>3-Act Task Box ‘Em Up</p> <p>Pearson enVision pg. 479</p>		
	<p>11.3 Pyramids and Cones</p> <p>Pearson enVision pg. 480 – 486</p>	<ul style="list-style-type: none"> Understand how the volume formulas for pyramids and ones apply to oblique pyramids and cones. Model three-dimensional figures as pyramids and cones to solve problems. 	GMD.1 GMD.2 GMD.3
	<p>11.4 Spheres</p> <p>Pearson enVision pg. 487 - 492</p>	<ul style="list-style-type: none"> Use Cavalieri’s Principle to show how the volume of a hemisphere is related to the volume of a cone and cylinder. Calculate volumes and surface areas of spheres and composite figures. 	GMD.3
	<p>Additional Resources:</p> <p>Teacher Created Notes</p>		
<p>Personalized Learning and Differentiation</p>			

Teachers differentiate by providing examples (work samples or task-specific clarifications of assessment criteria); structuring support (advance organizers, flexible grouping, peer relationships); establishing flexible deadlines, and adjusting the pace.

-SWD/504- Accommodations provided

-ELL- Five Principle ELL Curriculum Framework and Vocabulary Supports

-Intervention Support- Re-teaching Activities in Small Groups with Progress Monitoring

-Extensions- Enrichment Tasks and Projects

Resources

DOE Framework Tasks

Savvas Textbook Materials

DOE Geometry End-of-Course Milestone Formula Sheet