

MATH MCS MYP UNIT PLANNER

Teacher(s)	Schumacher, Hull	Subject group and discipline	Geometry - Honors		
Unit title	Unit 4: Circles	MYP year	5	Unit duration (hrs)	30 hours (8 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		
<p>Factual—</p> <ul style="list-style-type: none"> What are important circle vocabulary definitions? What are the parts of a circle? What are the important circle formulas to memorize? What do circumference and area represent? What is Cavalieri's Principle? How are 2-dimensional cross-sections identified from 3-dimensional shapes? <p>Conceptual—</p> <ul style="list-style-type: none"> Why are all circles similar? How is arc length proportional to the radius? How are secant and tangent lines constructed? What are the relationships between parts of a circle (angles, chords, tangents, secants, radii)? How are inscribed triangles and circumscribed triangles constructed? What are the properties for a quadrilateral inscribed in a circle? How do arc length and area of a sector relate to proportionality? How do you describe geometric formulas using informal arguments? What is the process to problem solve using geometric modelling of 3 dimensional shapes and volume calculation? 		

Debatable—

Do all cross-sections of fluid shaped have the same relationship with volume as cross sections of rigid shapes?

MYP Objectives**Assessments**

MYP Assessment – Rubric B
MYP Assessment – Rubric C

- Circle vocab and angles in circles Quiz MYP C Rubric
- Volume Quiz
- Circles Part A Test
- Circles Part B Test (cumulative with volume)

Approaches to learning (ATL)

- Give and receive meaningful feedback
- Negotiate ideas and knowledge with peers and teachers
- Use and interpret a range of discipline-specific terms and symbols
- Draw reasonable conclusions and generalizations
- Apply existing knowledge to generate new ideas, products or processes
- Apply skills and knowledge in unfamiliar situations

Action: Teaching and learning through inquiry**Content Standards**

MGSE9-12.G.C.1 Understand that all circles are similar.

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.

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.

MGSE9-12.G.C.4 Construct a tangent line from a point outside a given circle to the circle. Find arc lengths and areas of sectors of circles

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. Explain volume formulas and use them to solve problems

MGSE9-12.G.GMD.1 Give informal arguments for geometric formulas. 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.

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.

MGSE9-12.G.GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. Visualize relationships between two-dimensional and threedimensional objects

MGSE9-12.G.GMD.4 Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

Learning Activities and Experiences

Topic	Resources	Content Covered	Standards
Subunit – Test 1 8 Days			
Assessments for this Subunit: 1 HW Quiz (formative), MYP-B Quiz (formative), and Unit 4a Test (summative)			
Circle Similarity, Vocab, Formula	Circles Vocabulary	<ul style="list-style-type: none"> Basic circle vocabulary definitions 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. 	MGSE9-12.G.C.1
	Are all Circles Similar?	<ul style="list-style-type: none"> All circles are similar 	MGSE9-12.G.C.1
	Additional Resources: •		
Circle Segments and Constructions	10-2 Lines Tangent to a Circle Pearson enVision pg. 427 – 434	<ul style="list-style-type: none"> Identify lines that are tangent to a circle using angle measures and segment lengths. Solve problems involving tangent lines. 	MGSE9-12.G.C.2 MGSE9-12.G.C.3 MGSE9-12.G.C.4
	10-3 Chords Pearson enVision pg. 436 – 443	<ul style="list-style-type: none"> 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. 	MGSE9-12.G.C.2 MGSE9-12.G.C.3 MGSE9-12.G.C.4
	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. 	MGSE9-12.G.C.2 MGSE9-12.G.C.3 MGSE9-12.G.C.4
	Additional Resources:		
Circle Angles	10-4 Inscribed Angles Pearson enVision pg. 444 - 450	<ul style="list-style-type: none"> Identify and describe relationships among inscribed angles, include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles. 	MGSE9-12.G.C.2
	Additional Resources:		
Circumference/Area	Area and circumference of a circle	<ul style="list-style-type: none"> Give informal arguments for the formulas of the circumference of a circle and area of a circle using dissection arguments and informal limit arguments. 	MGSE9-12.G.GMD.1
	3-Act Task Earth Watch Pearson enVision pg. 435		

	Additional Resources:		
Subunit – Test 2 10 Days			
Assessments for this Subunit: 1 HW Quiz (formative), MYP-D Quiz (formative), and Unit 4b Test (cumulative/summative)			
Arc Length Area of a Sector	10-1 Arcs and Sectors Pearson enVision pg. 419 - 426	<ul style="list-style-type: none"> Calculate the length of an arc when the central angle is given in degrees or radians. Calculate the area of sectors and segments of circles. 	MGSE9-12.G.C.2 MGSE9-12.G.C.4 MGSE9-12.G.C.5
	Additional Resources:		
Volume of Geometric Shapes	11.2 Volumes of Prisms and Cylinders Pearson enVision pg. 470 – 478	<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. 	MGSE9-12.G.GMD.3
	3-Act Task Box ‘Em Up Pearson enVision pg. 479		
	11.3 Pyramids and Cones Pearson enVision pg. 480 – 486	<ul style="list-style-type: none"> Understand how the volume formulas for pyramids and cones apply to oblique pyramids and cones. Model three-dimensional figures as pyramids and cones to solve problems. 	MGSE9-12.G.GMD.1 MGSE9-12.G.GMD.2 MGSE9-12.G.GMD.3
	11.4 Spheres Pearson enVision pg. 487 - 492	<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. 	MGSE9-12.G.GMD.3
	Additional Resources: <ul style="list-style-type: none"> Circles Art Project 		
Cross-sections/ Density	11.1 Three-Dimensional Figures and Cross Sections Pearson enVision pg. 465 – 470	<ul style="list-style-type: none"> Use Euler’s Formula to calculate the number of vertices, faces, and edges in polyhedrons. Describe cross sections of polyhedrons. Describe rotations of polygons about an axis. 	MGSE9-12.G.GMD.4
	Additional Resources:		
Personalized Learning and Differentiation			

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

Pearson enVision Textbook and online resource

GA DOE Unit 4 Resources