Marietta City Schools

2023–2024 District Unit Planner

Accelerated Grade 6/7 Mathematics

Unit title	Unit 7: Exploring Area Volume	**MYP year**	*1*	**Unit duration (hrs)**	*20 hours total*

Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): ***What will students learn?***

GA DoE Standards

Standards

6.GSR.5: Solve relevant problems involving area, surface area, and volume.
6.MP: Display perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration and expression. Seek help and apply feedback. Set and monitor goals.

MCS.Gifted.S3C Use a variety of strategies for solving authentic, complex, real world problems through evaluative thinking and the engineering design processes.
MCS.Gifted.S4B. Recognize and examine the value of others strengths, thoughts, ideas, and feelings during collaboration.
MCS.Gifted.S4D Respectfully collaborate and effectively communicate exchanges of constructive/critical feedback.
MCS.Gifted.S6 Students will become self-directed, independent learners.

Concepts/Skills to support mastery of standards

Expectations		Evidence of Student Learning (not all inclusive; see Grade Level Overview for more details)		
6.GSR.5.1	Explore area as a measurable attribute of triangles, quadrilaterals, and other polygons conceptually by composing or decomposing into rectangles, triangles, and other shapes. Find the area of these geometric figures to solve problems.	***Age and Developmentally Appropriate*** • Students should build on prior knowledge of area to investigate the area of other polygons through geometric and spatial reasoning tasks.	***Strategies and Methods*** • Students should be able to use knowledge of area of a rectangle to determine the area of a triangle. • Students should have opportunities to find the area of a triangle by decomposing the rectangle into two triangles. • Students should conclude the area of the triangle is half the area of the rectangle and the area of the rectangle is twice the area of the triangle. Therefore, the formula for the area of a triangle is $\frac{1}{2}$ x base x height or $\frac{base\ x\ height}{2}$. • Students should be able to use geometric and spatial reasoning to calculate the area of a triangle, quadrilateral, and regular polygon by composing or decomposing into shapes, such as, but not limited to triangles, rectangles, trapezoids, rhombi, etc. • Students should be presented with mathematical problems found in the real world. • Students should be able to decompose regular and irregular polygons into triangles and quadrilaterals in a way that makes sense from their perspective.	***Terminology*** • A polygon is a closed figure with at least three straight sides and angles; a polygon is regular only when all sides are equal and all angles are equal; and a polygon is irregular when all sides are not equal or all angles are not equal.

6.GSR.5.2	Given the net of three-dimensional figures with rectangular and triangular faces, determine the surface area of these figures.	***Strategies and Methods*** • Students should use various tools and strategies including a picture or physical model of a net to measure the surface area of three-dimensional figures that are composed of rectangular and triangular faces when solving practical, mathematical problems.	***Age and Developmentally Appropriate*** • Students should be provided the net of three-dimensional figures to ensure developmental appropriateness.	
6.GSR.5.3	Calculate the volume of right rectangular prisms with fractional edge lengths by applying the formula, V = (area of base) x (height).	***Age and Developmentally Appropriate*** • Fractional edge lengths should be limited to fractions with a denominator of 2, 3, and 5. • At this grade level, problems should not include volume displacement.	***Fundamentals*** • Students should make the connection between (length) x (width) and the area of the base to connect this formula to other three-dimensional volume formulas.	***Strategies and Methods*** • Students should be able to calculate the volume of a right rectangular prism with fractional edge lengths and show that the volume is the same as would be found by multiplying the edge lengths of the prism. • Students should apply the formula for the volume of a right rectangular prism in the context of solving authentic, mathematical problems to meet this learning objective.

Vocabulary:

K12 Mathematics Standards Glossary

2- Dimensional	**Dimension**	**Lateral Faces**	**Rectangles**	**Surface area**	**3-Dimensional**
Edge	**Net**	**Rectangular Prism**	**Trapezoid**	**Area**	**Equilateral Triangle**
Parallelogram	**Rhombus**	**Triangles**	**Bases of Prism**	**Face**	**Polygon**
Right Triangle	**Triangular Prism**	**Composing**	**Fractional edge length**	**Polyhedron**	**Right rectangular prism**
Scalene Triangle	**Volume**	**Vertices**	**Cubic Units**	**Isosceles Triangle**	**Prism**
Decomposing	**Kite**	**Quadrilaterals**	**Square**	**Volume of a prism**	

Key concept	Related concept(s)	Global context
Form The shape and underlying structure of an entity or piece of work, including its organization, essential nature and external appearance.	**Measurement, Space, Model**	**Orientation in Time and Space Natural and Human Landscapes and Resources**

Statement of inquiry

Understanding simple shapes helps us enhance our environments.

Inquiry questions

Factual

- How do simple figures help us find the area of more complex figures?
- How is absolute value used to determine the distance between two points?
- How can I use manipulatives and nets to help compute the surface areas of prisms?

Conceptual

- What kind of problems can be solved using surface areas of rectangular and triangular prisms?
- What kind of problems can be solved using volumes of fundamental solid figures?

Debatable:

- Decomposing is more efficient than using composing to determine the area of an irregular shape?

MYP Objectives	Assessment Tasks	
*What specific MYP **objectives** will be addressed during this unit?*	***Relationship** between summative assessment task(s) and statement of inquiry:*	*List of common formative and summative assessments.*
Criteria D (Applying Math to real-world context)	Assessments will involve students in solving real-world style problems based on calculating surface area and volume of 2D and 3D figures.	**Formative Assessment(s):** Unit 7 CFA MYP Task: Candy Box Design Challenge **Summative Assessment(s):**

		Unit 7 Summative
Approaches to learning (ATL)		
Category: Social **Cluster:** Collaboration Skills **Skill Indicator:** Give and receive meaningful feedback.		

Learning Experiences Add additional rows below as needed.		
Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation**
6.GSR.5.1 Explore area as a measurable attribute of triangles, quadrilaterals, and other polygons conceptually by composing or decomposing into rectangles, triangles, and other shapes. Find the area of these geometric figures to solve problems.	**Area of Special Quadrilaterals** *Illustrative Mathematics* The purpose of this task is for students to use what they know about the area to find the areas of special quadrilaterals. An open-ended task like this provides a great opportunity for students to explain their reasoning and may lead to student critiques of each other's reasoning MP.3.	Students can take pattern blocks to create the irregular figures and take them apart to find the areas.
6.GSR.5.2 Given the net of three-dimensional figures with rectangular and triangular faces, determine the surface area of these figures. **6.GSR.5.3** Calculate the volume of right rectangular prisms with fractional edge lengths by applying the formula, V = (area of base) x (height).	**The Candy Box Challenge** In this activity, students will gain a deeper understanding of surface area and volume by designing various box shapes with a fixed volume of 24 cubic inches. This engaging task encourages students to think creatively, apply mathematical concepts, and enhance their communication skills. Through sketches, calculations, and reflection, students will explore the relationship between surface area, volume, and practical design considerations.	Extension: Look at other real-life examples: Offer examples of real-world objects (e.g., cereal boxes, gift boxes) and challenge students to calculate the surface area and volume. This can help struggling students see the practical application of the concepts. Using solid, physical objects can help students who struggle visualizing dimensions.
Content Resources		
6-11 Savvas Correlation to 2021 standards • Georgia Standards Lessons and Resources website • Savvas Topic 7 • https://www.Mathigon.org/polypad • Savvas Math Tools: https://media.pk12ls.com/curriculum/math/enVision6-8/enV6-8_html5tools_launch/index.html • Geogebra: https://www.geogebra.org/geometry?lang=en • Illuminations Shape Tool: https://www.geogebra.org/geometry?lang=en • Annenburg Solids: https://www.learner.org/wp-content/interactive/geometry/prisms/		

- XY Pegboards