Marietta City Schools

2025–2026 District Unit Planner

Geometry: Concepts & Connections

Unit title	Unit 7: Modeling with Equations and Measurement	**MYP year**	*5*	**Unit duration (hrs)**	13 hours

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

GA DoE Standards

Standards

G.GSR.9 Develop informal arguments for geometric formulas using dissection arguments, limit arguments, and Cavalieri's principle; solve realistic problems involving volume; explore and visualize relationships between two-dimensional and three-dimensional objects to model and explain real-life phenomena.

G.GSR.9.1 Use volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems including right and oblique solids.

Fundamentals

• Students should be able to verify experimentally the formulas for the volume of a cylinder, pyramid, sphere, prism and cone; emphasize volume as the product of the area of the base and the height for both prisms and cylinders.

• Students should be able to use and explain Cavalieri's Principle to show that the volume of an oblique solid can be found using right solids.

• Students should find the volume of solids and composite solids to explain real-life phenomena.

Terminology

• Prism – a solid figure that has the same cross section all along its length

G.GSR.9.2 Use geometric shapes, their measures, and their properties to describe objects and approximate volumes.

Strategies and Methods

• Students should be able to choose the appropriate geometric solid to approximate volumes of irregular objects.

Example

• Modeling a tree trunk or a human torso as a cylinder

G.GSR.9.3 Apply concepts of density based on area and volume in modeling situations.

Strategies and Methods

• Students should be able to choose the appropriate geometric figure or solid to approximate density of irregular objects in a geometric situation.

Example

• Persons per square mile, fish per cubic feet of a fish tank

G.MM.1: Apply mathematics to real-life situations; model real-life phenomena using mathematics.

G.MM.1.1 Explain mathematically applicable problems using a mathematical model.

Fundamentals

• Students should be provided with opportunities to learn mathematics through the exploration of real-life problems.

• Mathematically applicable problems are those presented in context where the context makes sense, realistically and mathematically, and allows for students to make decisions about how to solve the problem (model with mathematics).

G.MM.1.2 Create mathematical models to explain phenomena that exist in the natural sciences, social sciences, liberal arts, fine and performing arts, and/or humanities contexts.

Fundamentals

• Students should be able to use the content learned in this course to create a mathematical model to explain real-life phenomena.

G.MM.1.3 Using abstract and quantitative reasoning, make decisions about information and data from a mathematically applicable situation.

Fundamentals

• Students should be able to connect learning of geometric shapes and their properties to describe objects.

• Students should be able to apply geometric methods and data to make decisions about structures and solve real-world problems.

G.MM.1.4 Use various mathematical representations and structures with this information to represent and solve real-life problems.

Fundamentals

• Students should be able to construct a model by selecting and creating algebraic and geometric representations that describe relationships between variables in context.

Concepts/Skills to support mastery of standards

- Calculate volume of solids and composite solids
- Calculate missing measurements given volume of solids
- Estimate volume of irregular objects
- Calculate density with area and volume for solids and populations

Vocabulary

Base	Cavalieri's Principle	Cone	Cylinder	Density	Geometric Properties
Height	Irregular Object	Oblique Object	Prism	Pyramid	Right Solid
Sphere	Volume				

Notation

V = B*h V = 1/3 * B *h D = m / v Volume units of measure: m^3, ft^3, in^3, etc Density units of measure: g/m^3, kg/L^3, people/m^2, etc.

Key concept	Related concept(s)	Global context
Relationships	Representation Models	Globalization and sustainability

Statement of inquiry

Relationships between 3D models and representations can be used to help with urban planning and infrastructure.

Inquiry questions

Factual—

How do we calculate the volume of a solid?

What are cross sections?

Conceptual—

How do cross sections relate to the volume of a solid?

How do we derive the volume formulas of a cylinder, sphere, and pyramid?

Debatable-

How can you use measure and geometric knowledge of volume of solid to design space cities with specific parameters?

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.*
MYP C Communication **MYP D** Applications	Students will be able to communicate using mathematical language and correct forms of mathematical representation to describe the process of calculating the volume of a composite solid. Students will be able to identify relevant information and apply math strategies to reach a correct solution in the real-life situation of determining more favorable brands when comparing volume and price of concrete brands.	**Formative Assessment(s):** MYP C/D - Volume Skill Checks - Honors **Summative Assessment(s):** Unit 7 Test - Volume and Density

Approaches to learning (ATL)

MYP C - Volume
Category: Communication Skills
Cluster: Communication
Skill Indicator: Use and interpret a range of discipline-specific terms and symbols

MYP D - Volume

Category: Thinking Skills
Cluster: Transfer
Skill Indicator: Change the context of inquiry to gain a different perspective

Learning Experiences Add additional rows below as needed.		
Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation**
• G.GSR.9.1 Use volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems including right and oblique solids. • G.GSR.9.2 Use geometric shapes, their measures, and their properties to describe objects and approximate volumes.	**Volume of Composite Solids (Diagnostic, Explore, and Apply) GA DOE** **Description:** In this learning plan, students will calculate the volume of composite shapes. The lesson will help students decompose shapes into its components. **Learning Goal:** ● I can find the volume of composite solids made up of cylinders, prisms, pyramids, cones, and spheres.	- On-Level Only Task - Provide hands on volume manipulatives to “create” the composite shapes. - Extension (apply): Students can also determine the cost associated with the quantity of boxes by using sample prices for boxes online and creating a standard shipping price for each box.
• G.GSR.9.1 Use volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems including right and oblique solids. • G.GSR.9.2 Use geometric shapes, their measures, and their properties to describe objects and approximate volumes.	**Approximating Volume of Irregular Objects -** Part I and II (GA DOE) **Description:** In this learning plan, students will choose the appropriate geometric solid to approximate the shape of an irregular object and use the formula to estimate their volume. **Learning Goal:** ● I can choose the appropriate geometric solid to approximate volumes of irregular objects.	- Honors Only Task - Provide hands on volume manipulatives to “create” the irregular shapes - Extend: Challenge students to calculate volume of irregular shapes within the classroom
Content Resources		
Textbook Correlation: enVision A|G|A - Geometry **G.GSR.9.1** - Lesson 11-1, 11-2, 11-3, 11-4 **G.GSR.9.2** - Lesson 11-1, 11-2, 11-3, 11-4 **G.GSR.9.3** - Lesson 7-1, 9-1, 11-2		