

Unit #3 Volume

Content Area: **Template**

Course(s):

Time Period:

Length: **5 weeks**

Status: **Published**

State Mandated Topics Addressed in this Unit

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N/A	N/A

Volume

Learning Objectives

- Objective 1 - Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.★
- Objective 2 - Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.
- Objective 3 - Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.★
- Objective 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.

Essential Skills

- Essential Skill 1 - Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.★
- Essential Skill 2 - Give informal arguments for the formulas of circumference and area of a circle.
- Essential Skill 3 - Give informal arguments for the volume of a cylinder, a pyramid, and a cone.
- Essential Skill 4 - Use dissection arguments, Cavalieri's principle, and limit arguments.
- Essential Skill 5 - Use the volume formula for cylinders, pyramids, cones, and spheres to solve problems.
- Essential Skill 6 - Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

Standards

MATH.9-12.G.GMD.A.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.
MATH.9-12.G.GMD.A.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
MATH.9-12.G.GMD.B.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.
MATH.9-12.G.GPE.B.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.

Instructional Tasks/Activities

- G.GMD.A.1 Activity #1 – Developing Circumference Formula
- G.GMD.A.1 Activity #1a – Learning about Pi
- G.GMD.A.1 Activity #2 – Developing Parallelogram Formula
- G.GMD.A.1 Activity #3 – Developing Triangle Formula
- G.GMD.A.1 Activity #4 – Developing Trapezoid Formula
- G.GMD.A.1 Activity #5 – Developing Regular Polygon Formula
- G.GMD.A.1 Activity #6 – Developing Circle Formula
- G.GMD.A.1 Activity #7 – Investigating Volume Formula for Pyramids
- G.GMD.B.4 Activity #1 – Cross Section of a Cube
- G.GMD.B.4 Activity #2 – 2D Cross Sections & 3D Solids

Assessment Procedure

- Classroom Total Participation Technique
- Classwork
- DBQ
- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Journal / Student Reflection
- Kahoot
- Other named in lesson
- Peer Review
- Performance
- Problem Correction
- Project
- Quiz
- Rubric
- Teacher Collected Data
- Test

- Worksheet

Recommended Technology Activities

- Appropriate Content Specific Online Resource
- Appropriate Content Specific Online Resource
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Gimkit
- GoGuardian
- Google Classroom
- Google Docs
- Google Slides
- Google Slides
- Kahoot
- MagicSchool AI
- Other- Specified in Lesson
- Quiziz
- Screencastify

Accommodations & Modifications & Differentiation

Accommodations and Modifications should be used to meet individual needs. Their IEP and 504 plans should be used in addition to the following suggestions.

Gifted and Talented

- Compare & Contrast
- Conferencing
- Debates
- Jigsaw
- Peer Partner Learning
- Problem Solving
- Structured Controversy
- Think, Pair, Share
- Tutorial Groups

Instruction/Materials

- alter format of materials (type/highlight, etc.)
- color code materials
- eliminate answers
- extended time
- extended time
- large print
- modified quiz
- modified test
- Modify Assignments as Needed
- Modify/Repeat/Model directions
- necessary assignments only
- Other (specify in plans)
- other- named in lesson
- provide assistance and cues for transitions
- provide daily assignment list
- read class materials orally
- reduce work load
- shorten assignments
- study guide/outline
- utilize multi-sensory modes to reinforce instruction

Environment

- alter physical room environment
- assign peer tutors/work buddies/note takers
- assign preferential seating
- individualized instruction/small group
- modify student schedule (Describe)
- other- please specify in plans
- provide desktop list/formula

Honors Modifications

Resources

- <http://geometrycommoncore.com/>
- <https://education.ti.com/en/timathnspired/us/standards-search>
- <https://www.engageny.org/resource/high-school-geometry>