Unit 6: Angle Relationships & Volume
Algebra Prep
8 Class Meetings
Revised May 2025

Essential Questions

- How do translations, reflections, rotations, and dilations relate to each other?
- When would we need to solve for volumes of cones, cylinders, and spheres?

Enduring Understandings with Unit Goals

EU 1: Lines, angles, and shapes have certain relationships
- Find interior and exterior angles of a triangle
- Identify and find angles formed when parallel lines are cut by a transversal.

EU 2: Volume can be measured in various shapes including cylinders, cones, and spheres.
- Apply the formulas to calculate the volume of a cylinder, cone, and sphere

Standards

Common Core State Standards:

- **8.G.A.5**: Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.
- **8.G.C.9:** Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.
Competency 2: Speak to diverse audiences in an accountable manner.
Competency 3: Develop the behaviors needed to interact and contribute with others on a team.
Competency 4: Analyze and solve problems independently and collaboratively.
Competency 5: Be responsible, creative, and empathetic members of the community.

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Unit Content Overview

1. **Determine angles of triangles and parallel lines**
    - Find measures of interior and exterior angles of triangles
    - Identify and find types of angles created when parallel lines are cut by a transversal
    - Vocabulary: triangle, complementary angle, supplementary angle, interior angle, exterior angle, side, angle measure, degree, parallel lines, alternate-interior angle, alternate-exterior angle
2. **Using formulas to find the volume of cylinders, cones, and spheres.**
    - Determine the volume of a cylinder, cone, and sphere.
    - Vocabulary: area, circle, denominator, exponent, formula, improper fraction, integer, irrational number, mixed number, number line, numerator, perimeter, rational number, rectangle, whole number, volume, decimal

Interdisciplinary Connection:

- Language Arts - Word Problems

Daily Learning Objectives with *Do Now Activities*

Students will be able to…

- Find the measures of interior and exterior angles in a triangle
    - *TWPS – Describe how you can determine the missing angle in the triangle below. Explain your work.*
- Identify and find measures of angles formed by parallel lines being cut by a transversal**
    - *TWPS – What is the error in the student's work when determining the measures of the angles below?*
    - *TWPS – How are corresponding angles related to vertical angles?*
- Find the volume of a cylinder and determine missing measurements if given the volume
    - *TWPS – Where do you see cylinders in your own life? How could you measure their volume?*
- Find the volume of a cone and determine missing measurements if given the volume
    - *TWPS – How is the formula for volume of a cylinder related to the formula for that of a cone?*
- Find the volume of a sphere and determine missing measurements if given the volume
    - *TWPS – How could you determine the radius of the sphere if you are given the volume? How is this different from finding the radius of a cylinder?*

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Instructional Strategies/Differentiated Instruction

- Whole-group instruction
- Creating authentic connections for students
- Rephrasing and restatement of information and concepts
- Guided notes
- Student-led instruction
- Independent problem-solving
- Collaborative problem-solving
- Cross-curricular problem solving (independent and collaborative)
- Accountable Talk
- Manipulatives
- Cumulative Homework
- Visuals to support instruction
- Small group instruction
- Pre-teaching and reteaching
- Multiplication charts
- Number lines
- Explicit instruction
- Color-coding
- Small group check in
- Differentiated homework assignments
- Differentiated assessments

EL DIFFERENTIATED INSTRUCTION:

- Word Walls with visuals
- TWPS (Think, Write, Pair, Share)
- Pre-reading strategies
- Culturally responsive teaching
- Explicit Modeling
- Key Vocabulary
- Graphic Organizers
- Strategic Grouping
- Non-verbal Assessments

Assessments

FORMATIVE ASSESSMENTS:

- Whiteboards
- Mid-class check-ins
- Exit Slips
- Student-led instruction
- Homework

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- Accountable Talk Discussions
- Daily Do Now
- Performance Task – Cone Conundrum
    - Summative Performance Task Assessment Rubric

SUMMATIVE ASSESSMENTS:
- Pear Assessment Quiz 1 – EU 1
- Unit 6 Test – EU 1 and EU 2
- Performance Task – Cone Conundrum

Unit Task

Unit Task Name: Cone Conundrum

Description: In this task, students will apply their knowledge of finding volumes of various shapes (EU 1) to answer a series of questions and create functions representing the calculated values. Students will need to show correct mathematical work while explaining their work in creating relevant functions.

Evaluation: Summative Performance Task Assessment Rubric

Unit Resources

- Worksheets
- Calculator
- Laptops
- SBAC Prep Online
- Pear Assessment
- Kahn Academy
- Gimkit
- Quizizz
- Individual Whiteboards
- 2 Truths & One Lie
- State Common Core Standards Transition Tasks
- Online resources