Unit 4 Relationship in Geometry
Math 6

Last Update: August 1, 2025

*Archdiocesan Curriculum > Grade 6 > Math > Length of unit 28 to 34 days

Stage 1: Desired Results

General Information

This unit focuses on developing students' understanding of the coordinate plane and applying geometric concepts in two and three dimensions. Students will learn to graph rational numbers, identify and analyze polygons, calculate distances, and determine perimeter and area. The unit progresses to exploring surface area using nets and solving volume problems involving rectangular prisms. Emphasis is placed on conceptual understanding, real-world applications, and connecting mathematical skills across topics.

Essential Question(s)

- How can rational numbers be used to locate points on the coordinate plane?
- What do the coordinates of a point tell us about its position?
- How can we use geometry to solve real-world problems involving distance, perimeter, area, and volume?
- In what ways do different geometric figures relate to each other on the coordinate plane?
- How can nets help us understand and calculate the surface area of three-dimensional shapes?

Enduring Understanding/Knowledge

Students will:

- Locate rational ordered pairs on the coordinate plane.
- Solve problems by graphing and identifying polygons in the coordinate plane.
- Use absolute value to find the distance between two points with the same x- or y-coordinate.
- Find the perimeter and area of polygons on the coordinate plane.

Review/Assess

- Find the area of parallelograms.
- Find the area of triangles.
- Find the area of trapezoids.
- Find the area of composite figures.

Review/Assess

- Use nets to find surface area.
- Find the volume of a rectangular prism.
- Write equations to solve problems involving volume of rectangular prisms.

Review/Assess

Vocabulary

New	Review
• coordinate plane • ordered pair • origin • quadrant • x-axis • y-axis • polygon • vertex • reflection • base of a triangle • diagonal • height of a triangle • base of a trapezoid • height of a trapezoid • trapezoid • composite figure • net • pyramid • surface area	• axes • coordinates • rectangle • x-coordinate • y-coordinate • hexagon • isosceles triangle • pentagon • quadrilateral • right angle • right triangle • transformation • area • base • height • base of a parallelogram • height of a parallelogram • parallelogram • solid figure • volume

Connections to Catholic Identity / Other Subjects

Religion/Catholic Identity:

- Calculate the size of Noah's Ark using the dimensions provided in Genesis 6:15-16. (Note a *cubit* is approximately 18 ins or 44 cm.)
- Research units of measure used in the Bible.

Other Subject Here:

- Shapes both 2D and 3D can be easily integrated into art projects.
- Social Studies classes can research different units of measure used throughout history. See the link below in resources.

Differentiation

Enrichment

- Include more advanced rational numbers (fractions and decimals in the same expression)
- Complete order of operations problems that include more terms and more rational numbers.

Supports

- Order of Operations Foldable
- List of keywords for operations

Standards & Benchmarks

Polygons on the Coordinate Plane:

6.NS.2
Explain how opposite signs of numbers indicate locations on opposite sides of 0 on the number line; identify the opposite of the opposite of a number.

6.AF.3
Solve equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ fluently for cases in which p, q and x are all nonnegative rational numbers. Represent real-world problems using equations of these forms and solve such problems. (E)

6.AF.5
Solve real-world and other mathematical problems by graphing points with rational number coordinates on a coordinate plane. Include the use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. (E)

6.NS.C.6.a
Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself. For example, –(–3) = 3, and that 0 is its own opposite.

6.G.A.3
Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

Area of Triangles and Special Quadrilaterals:

6.GM.3
Find the area of complex shapes composed of polygons by composing or decomposing into simple shapes; apply this technique to solve real-world and other mathematical problems.

6.G.A.1
Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

CCSS.Math.Content.6.G.A.1
Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

6.G.1
Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

6.2.3.5
Find the area of special quadrilaterals and polygons by composing into rectangles or decomposing into triangles and other shapes. Apply these techniques in contextual mathematical situations. (MP2, MP5)

Surface Area and Volume:

6.GM.4
Find the volume of a right rectangular prism with fractional edge lengths using unit cubes of the appropriate unit fraction edge lengths (e.g., using technology or concrete materials) and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths to solve real-world and other mathematical problems. (E)

6.G.A.4
Represent three-dimensional figures using nets made up of rectangles and triangles and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
6.G.A.2
Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ (where B stands for the area of the base) to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
CCSS.Math.Content.6.G.A.2
Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
CCSS.Math.Content.6.G.A.4
Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Teaching Ideas/Resources

Websites/Resources:

- **Surface Area and Nets Notes** – This note sheet allows students to see nets of 3D shapes that allow students to have all the info in the same spot. You may consider writing the volume formula for rectangular prisms on this note sheet also.
- **3-D Art and Geometry Project** - Students create 3-D shapes with patterns to explore the shapes in the real world.
- **Ancient Units of Measure** - This website details units of measure used in ancient history.
- Patterns in Nature - This website and video details how patterns show up and repeat in nature.
- **Graphing Pictures** – This site contains sets of coordinate pairs to graph different pictures from cartoon characters to sports logos.