COMMON CORE CONNECTION: **PRECISE PATTERNS**

WORKS OF ART
1. *Amphora with Funerary Scenes*, Workshop of Painter of Athens, 720–710 BCE (Geometric)
2. *Herakles and the Erymanthian Boar*, Greek, 520 BCE (Archaic)
3. *Red Figure Amphora with Musical Scene*, Niobid Painter, ca. 460–450 BCE (Classical)

COMMON CORE CONNECTION: Standards for Mathematical Practice: MP6—Attend to Precision

OVERVIEW
Students will learn about patterns used by ancient Greek artists. They will create their own patterns and calculate how to draw the patterns on an amphora.

VOCABULARY

*Amphora* a large Greek storage vase with an oval body usually tapering toward the base, and two handles extending from just below the lip to the shoulder; plural form is amphorae

*Circumference* the outer boundary, especially of a circular area; perimeter

*Meander* an interlaced, angular design; fretwork

*Palmette* a motif in decorative art which resembles the fan-shaped leaves of a palm tree

*Pattern* a discernible regularity in the world or in a manmade design; the units of a pattern repeat in a predictable manner

*Radius* straight line extending from the center of a circle or sphere to the circumference or surface
ACTIVITY

1. Show students images of the amphorae (More examples and information about the amphorae included in this lesson are available at art.thewalters.org. Further examples are available at britishmuseum.org).

   Ask students:
   *What do you think these objects are? How do you think they were used in ancient Greece?*
   An amphora is a two-handed vessel used to store wine, oil, honey, or grain. Some highly decorative vases, which depict funerary scenes, were made for burial in tombs. Others were created as prizes for the Panathenaic festival, which was celebrated in Athens every four years in honor of the goddess Athena. Amphorae were formed on a potter’s wheel using terracotta, a clay-based material.

2. Lead a discussion to compare and contrast the geometric patterns and depictions of figures on amphorae from the Geometric, Archaic, and Classical periods of Greek art.

   Ask students:
   *What shapes do you see on the amphorae? What patterns do you see? How did the artists use patterns to create decoration on the amphorae? How did the artists depict people and what stories do the amphorae tell?*

   Amphorae in the geometric style included abstract motifs as well as designs such as triangles and meanders (also known as the key or fret design) that fill the amphora surface. The palmette design was common on amphorae from the Archaic and Classical periods. In addition, figures were featured more prominently than on earlier versions. On black-figure amphorae, the artist painted figures and decorations directly on the terracotta surface, and then scratched away contours and details. On red-figure amphorae, the artist painted rather than scratched details on the figures which allowed for greater realism, better representation of the human figure, and advances in the rendering of perspective.

3. Tell students that it is their turn to become amphora artists. On the board, model how to create a pattern using different shapes, for example □◯◊ □◯◊ □◯◊ in a 1,2,3, 1,23... pattern. On a piece of scrap paper, students will brainstorm ideas for their own patterns using geometric shapes and lines. They should have sketches for two final patterns.

4. Ask students: *In order to paint your patterns on an amphora, what mathematical formulas and measurements would you need to ensure that your patterns fit precisely around the 3-dimensional vessel without any gaps or overlapping?*

5. Tell students that the radius at the top or neck of an amphora is 2" and the radius at the bottom or base of an amphora is 4". Ask students to use this information to calculate the circumference (C=2πr) of the amphora at the top and bottom.

6. Students will divide the circumference of the amphora by the number of possible units in their patterns to determine the width of their units. Ask students: *Based on the circumference at each location, what would be the width of each unit of your pattern if you draw 10 units? What would be the width of each unit if you draw 15 or 20 units?*

7. Once students determine the number and width of units for their pattern, they will carefully measure and draw each unit to scale using a ruler and/or compass. They will then cut out each unit to use as a template to draw their two patterns to scale on a piece of paper. Ask students to measure the lengths of their patterns.

   *Do the lengths of the patterns equal the circumferences that you calculated in step 5? Why or why not?*

8. Extension: Give students a copy of the amphora template and ask them to draw their patterns in addition to a figural theme based on their knowledge of ancient Greece.
Red Figure Amphora with Musical Scene, Niobid Painter, ca. 460–450 BCE (Classical)