

## COMMON CORE MATH AND ISLAMIC ART

One of the skills highlighted in the Common Core State Standards for mathematics involves generating and analyzing patterns and pattern relationships. Islamic art made for a religious purpose or setting does not include images of people, and often focuses on intricate geometric designs. A close look at Islamic art provides an opportunity, not only for the reinforcement of these Common Core skills, but also for a glimpse inside this important culture.



*Star Tile*, 13th century  
Iran or Persia  
Tin-enameled and luster-painted pottery  
9 5/8 x 9 5/8 inches (24.4 x 24.4 cm)  
Gift of the Associate Committee of Women, 1916  
1916-166

### Curricular Areas

Mathematics

### Grade Level

For grades 4–8, adaptable for elementary and high school

### Common Core Academic Standards

- [CCSS.Math.Content.4.OA.C.5](#)
- [CCSS.Math.Content.5.OA.B.3](#)

### Art Images Required

Click on the titles below to view high-resolution photographs on the Philadelphia Museum of Art website. Images that are also available in the Artstor Digital Library are indicated by an ID number or search phrase. Entering that number or phrase into the Artstor search bar will direct you to the corresponding image in that database.

- [Star Tile](#), 13th century, Iran or Persia  
Artstor search: Not available, although several similar images can be found by entering “star, Iran”
- [Tile Mosaic Panel](#), 16th century, Iran  
Artstor search: 1931-76-1
- [Palmette and Cloud Band Rug](#), 17th, 19th, or early 20th century, Iran  
Artstor search: 1941-98-1

## Lesson Process

1. Whether existing in nature, in works of art, or in architectural design, patterns have three characteristics. There is a unit—perhaps a star or a leaf. There is a sequence of repetition of the unit (or units). And there is a system—some way the repetition is organized. For example, the system could be spiral, linear, or mounded (units piled on top of each other). Look around the classroom. What patterns can you see? Can you identify the three elements of any of those patterns? Think of the natural world. Are there patterns in nature that you can recall and describe? (NOTE: Patterns in nature can often be incomplete or inexact.)
2. Pull up the image of the *Star Tile* and look closely. Take a minute to silently note details of this tile. How many points does this star have? How about the small blue star in the center, how many points does it have? This tile is more complicated than just one star inside another. What other designs are repeated in this tile? (Answer: Blue “leaves” or “flowers.”) Point out to students that some of the designs are actually Arabic writing. Arabic writing often becomes a part of the intricate designs in Islamic art. Have students draw a simple sketch of the basic lines and shapes of the tile. From this sketch, have them identify the unit, sequence, and system. (NOTE: There can be more than one correct response, depending on what design within the tile is being examined.)
3. Pull up the image of the *Tile Mosaic Panel* and look closely. Take some time to read the information given about this panel on the Museum’s website, listen to the audio stop, and click on the Teacher Resources tab. Discuss the original location and purpose of this mosaic panel. What shapes do you see in this panel (there are many), and what patterns can you find? Working in pairs (or in small groups of three), have students focus on one pattern and identify the unit, sequence, and system. (NOTE: With added complexity, responses will naturally vary.)
4. A pattern can be thought of as a regularity in the world. Scientists seek patterns as they try to formulate or prove new theories about how the world works. In nature, patterns can be found in spirals (like the seeds in the center of a sunflower), meanders (like the way a stream moves through a valley), waves, foams (like sponges or ocean foam), and cracks (like a dried-up lake bed). Of course, there are many other types of patterns, both natural and man-made. (NOTE: Extend this discussion by observing a collection of photographs of nature, emphasizing some of these patterns.)
5. Works of art are considered primary sources. We can look at the works mentioned in this lesson plan and learn about the people and/or cultures that created them. For example, consider both the *Mosaic Panel* and the *Star Tile*. What colors seem to dominate? What shapes? What are some possible reasons that the color blue is so dominant in these tiles from Iran? We know that the *Mosaic Tile* was made for a Sufi monastery. What ideas come from this added information? Why might images of flowers, leaves, and vines be important? Discuss your ideas. How could you find support for your ideas?
6. Notice that there are no depictions of people in these tiles. While some secular (non-religious) art does include people and animals, you will find that religious art from the Islamic world does not. What are possible reasons for this? How could you find support for your ideas? Research this aspect of Islamic art further. (NOTE: The Metropolitan Museum’s [Heilbrunn Timeline of Art History](#) is a good source for your students. You can also download a teaching packet from the National Gallery of Art called [Islamic Art and Culture](#).)

# PHILADELPHIA MUSEUM OF ART

## Assessment

1. Display the image *Palmette and Cloud Band Rug*. After reading about this object and examining it in detail, present or write about a pattern you see here. Be sure to include the three characteristics of patterns in your response. What else have you seen in the tiles from the lesson plan that also applies to this rug?

## Enrichment

1. The *Star Tile* contains patterns. However, it is also part of a larger work. Picture this tile as one of many tiles making up part of a wall, floor, or ceiling. (NOTE: If students have a difficult time imagining this, perhaps use several of their sketches to indicate how the larger pattern might appear.) Even though we don't have this larger pattern, can you describe a POSSIBLE sequence and system for the star unit? With a partner, sketch how this larger pattern might look.
2. Research the topic of Aniconism in Islamic art. How does what you learn from your research help you understand these works and other works you may see from this culture?