

# ART ADVENTURES

At-Home Art Project

## Kaleidoscopes



This *At-Home Art Project* is an exploration of **tessellations** and **symmetry**. **Tessellations** and **symmetry** are mathematical concepts that are often used in art. A **tessellation** is a pattern of shapes that fit perfectly together to cover a surface with no overlaps or gaps. **Symmetry** is when a shape or object has two completely identical sides that are either facing each other or are around an axis. An object is **asymmetrical** if there are no sections that are the same. An object has **radial symmetry** when you can divide it evenly around a center point and all the “slices of the pie” are the same, like a pizza!

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## Look at Art



*Iznik Plate, Turkey, 16th century*

This plate was made during the 16th century (1500s) by ceramic artists of the Ottoman Empire in what is now the country of Turkey. These artists often created floral designs inspired by the nature around them. On this plate there are tulips in different stages of blooming and a cypress tree in the center. This plate is an example of **bilateral symmetry**. Imagine a line drawn down the center of the cypress tree, creating two identical sides.

## Did You Know?!



Iznik is a city in Turkey where the ceramic artists of the Ottoman Empire continued their tradition of painting tiles, vases, and other ceramic objects into modern times, preserving the techniques and knowledge for future generations.

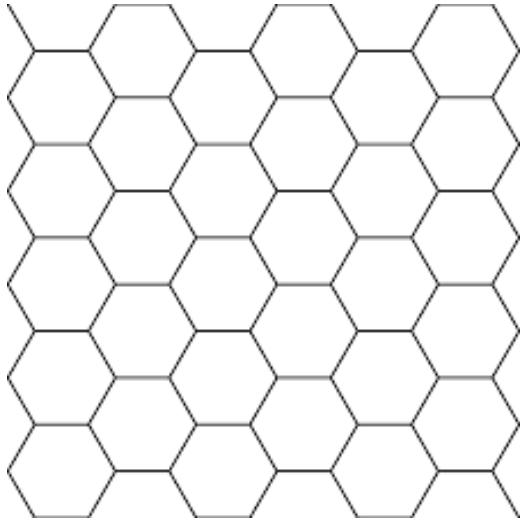


*Mausoleum Doors, Iran, 16th century*

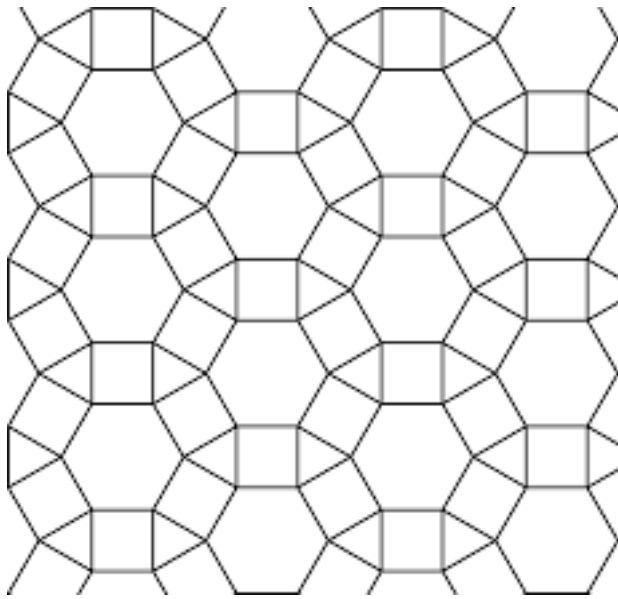
These doors originally opened into the **mausoleum** housing the tomb of Imamzada Sulayman, the son of a spiritual leader in Iran. The doors are each divided into five sections. The center three sections are decorated with wood carvings of star designs meant to symbolize the eternal heaven one hopes to enter when they pass away. The artist who made these doors was the son of a carpenter who came from a long line of skilled wood craftsmen.

What patterns or symmetry can you find on these doors? The carved patterns are a good example of **tessellation**.

**Regular tessellations** are made up of the same simple shape over and over:

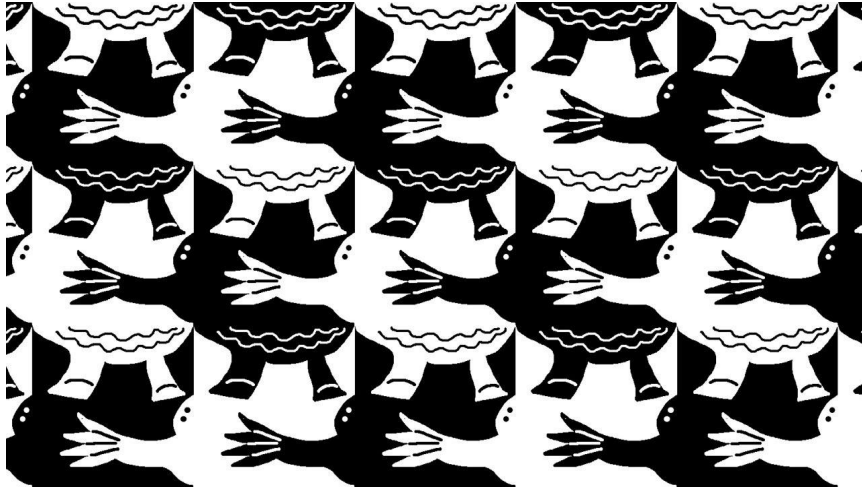


**Semiregular tessellations** are made up of two or more simple shapes:



**Demiregular tessellations** are made up of multiple kinds of organic shapes:





Look closely at the *Mausoleum Doors* again. What kind of tessellation can you see?

### *Challenge:*

*Which one of the images below has radial symmetry? What about bilateral symmetry? Asymmetry? Next, explore inside or outside your home to find more symmetrical objects. See if you can also spot some tessellations. Snap a few pictures or sketch the objects that you discover.*



Answer Key:

Butterfly – Symmetry

Snail – Asymmetry

Flower – Radial Symmetry

## Shape & Pattern Scavenger Hunt

A **tessellation** is a pattern of shapes that fit perfectly together to cover a surface with no overlaps or gaps. Shapes and patterns are all around us!

Use the list below to explore **shapes** and the **patterns** they create—inside, outside, or both! Collect the objects you find, take pictures, or make rubbings (this is done by placing an object under a piece of paper and rubbing a crayon across the paper).

When you find something new, ask yourself: What do I **see**? What do I **think** about this object? What do I **wonder** about it?

How did the shapes you found form patterns? Which one was your favorite, and why? What did you find that was unique or surprising?

### Look for...

- Circle
- Oval
- Heart
- Triangle
- Diamond
- Square
- Rectangle
- Star
- Pentagon
- Hexagon
- Octagon
- What else can you find?

## Make Art: Kaleidoscopes

A kaleidoscope is a tube that you look through that contains two or more mirrors, or reflective surfaces, that are tilted toward each other. The tube also has a compartment at one end filled with small, colorful objects. When you look through the eyepiece and turn the kaleidoscope tube, the colorful objects will reflect off the mirrors and make symmetrical patterns. A kaleidoscope uses reflection and gravity to create infinite symmetrical tessellations.

### **Supplies:**

- Two (2) toilet paper rolls
- Clear tape
- Scissors
- Piece of card stock (thick paper)
- Aluminum foil or a sheet of mylar
- Sequins or beads
- Glue
- Piece of clear plastic (like the lid of a to-go container)
- Colored paper or markers for decorating the outside

### **Steps:**

1. Cut a piece of mirrored paper that is four (4) inches by six (6) inches. You can buy mirrored mylar or glue a piece of aluminum foil to card stock.
2. Fold the mirrored paper into a triangle and tape it together. Then, slide it into one of the toilet paper rolls.
3. Trace the end of the toilet paper roll onto the clear plastic twice. Cut out the two circles.
4. Slide one of the plastic circles into the tube about half an inch (you may need to trim it so it will fit). It should rest against the end of the paper triangle.
5. Take the second toilet paper roll and cut about an inch off the end so that you have two pieces. You will only need the small inch-long piece.
6. Cut the inch-long piece down its side and slide it into the end of the longer main tube. This short tube should slide up against the first plastic circle. You do not need to tape it to the main tube.
7. Tape the second plastic circle to the end of the newly made inch-long tube. You may need to trim it to fit.
8. Fill the inch-long tube with sequins or beads and slide it into the end of the main tube. This serves as the rotating mechanism of the kaleidoscope.
9. If you want to make an eyepiece, trace the end of the toilet paper roll onto card stock and cut it out. Draw a smaller circle in the center and cut that out so you have a donut shape. Tape it into place.
  
10. If you need more directions, check out these video resources here from [WhatsUpMoms](#) and [MakeKidsCrafts.com](#):



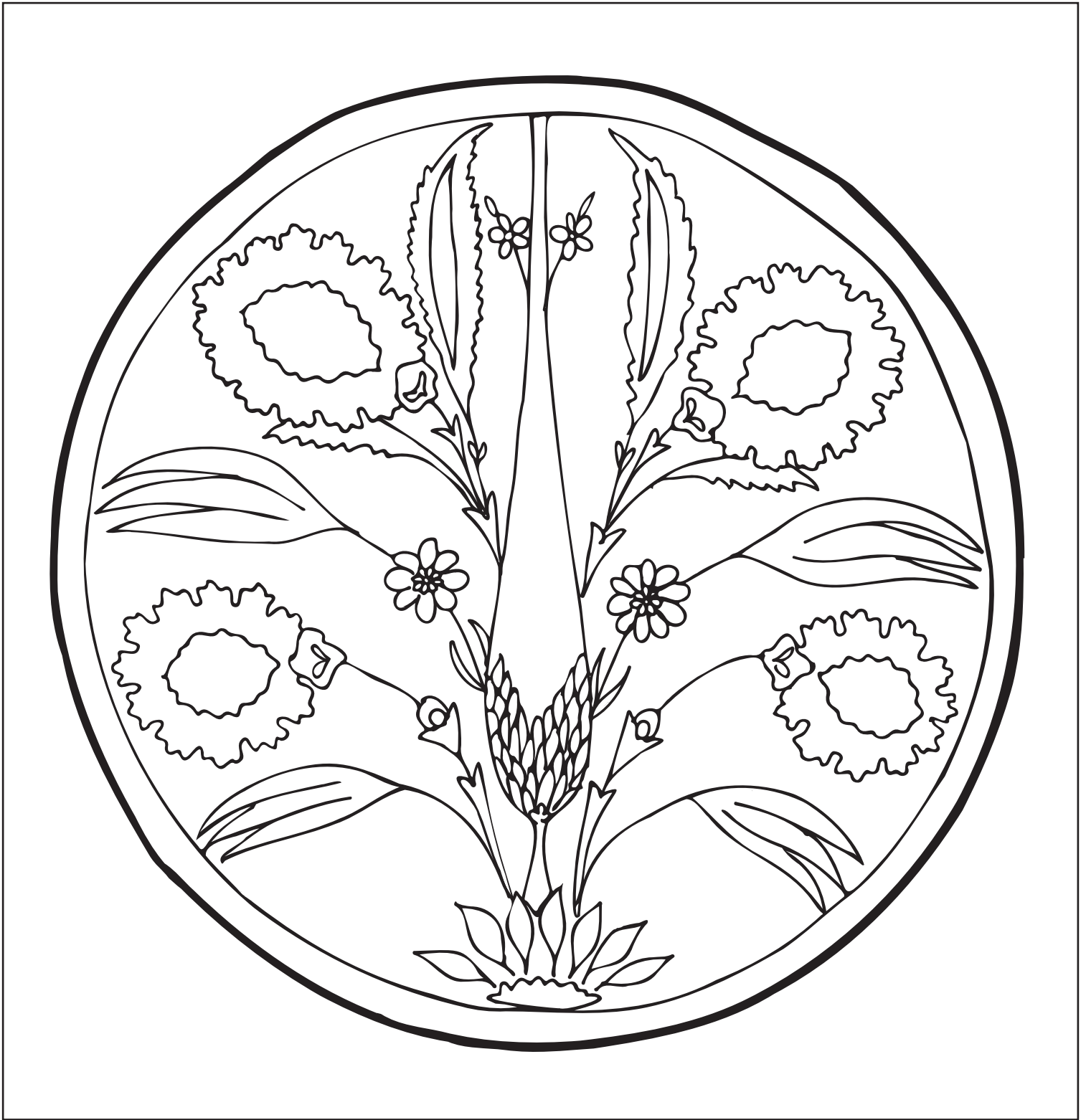
<https://www.youtube.com/watch?v=yShrIOj34r0>

<https://www.youtube.com/watch?v=uvPFJpwuzFM&t=23s>

**SHARE:** Send pictures of your artwork to [familyprograms@thewalters.org](mailto:familyprograms@thewalters.org) so that we can add them to our online gallery. Please include your first name and age.

**REFLECT:** Tell us about your experience by completing this quick [survey](#).

Summer Art Adventures are made possible by the Women's Committee of the Walters Art Museum, The Ludwig and Nancy Sternberger Charitable Foundation, Ellin & Tucker, and members and donors to the Walters Art Museum.



Iznik Plate  
Turkey, Iznik  
2nd quarter 16th century

The designs on this plate are inspired by **nature**. They are **symmetrical** through the middle of the plate, meaning the left and right sides are the same. Something is **asymmetrical** when the two sides are not the same. Add more nature-inspired designs to this plate. Will you make them **symmetrical** or **asymmetrical**? This plate was originally painted blue and green. What colors will you choose for your plate?