



Pop Up Science – Symmetry in Nature! Activity 1: Exploring Symmetry

Video Premiere
May 15, 2021
on Facebook!

What you need

- Small square or rectangular mirror
- Symmetry labels (provided)
- Picture examples (provided)
- Scissors
- Optional: Additional natural items such as leaves, flowers, etc. for examination

Follow the steps below to explore different types of symmetry in nature and learn how to identify lines of symmetry!

Preparation

1. Using your scissors, cut out the picture examples provided, as well as the symmetry labels.
2. Place the symmetry labels on a table or the floor, to create three different groupings.

What to do

1. Use the small mirror to find the line of symmetry (or lack of one) in each provided image.
2. To find bilateral (or reflectional) symmetry, you want to find where a line (in this case, the mirror) can be drawn through an object such that the two halves are mirror images of each other.
3. To find radial (or rotational) symmetry, you should be able to place the mirror along pretty much any angle and see a mirror image of the shape.
4. If you cannot find any lines of symmetry at all, the object is considered asymmetrical.
5. Place each image under the appropriate symmetry label heading.
6. Optional: Go on a nature walk outside and find some leaves, flowers, and other items and then see if you can identify their lines of symmetry!



Image from buggyandbuddy.com

What is happening?

In geometry, an object exhibits symmetry if it looks the same after a “transformation,” such as reflection or rotation. In biology, symmetry refers to a correspondence of body parts, in size, shape, and relative position, on opposite sides of a dividing line or distributed around a central point or axis. Many organisms exhibit either bilateral or radial symmetry, although some like sponges and amoebas are asymmetrical. By using the mirror, you were able to find lines of symmetry in different examples from nature and group them according to their property of symmetry. Most animals are bilaterally symmetrical, with a line of symmetry dividing their body into left and right sides. What kind of symmetry does YOUR body exhibit?

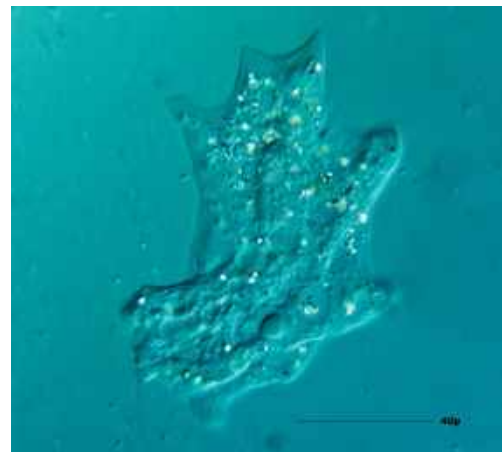
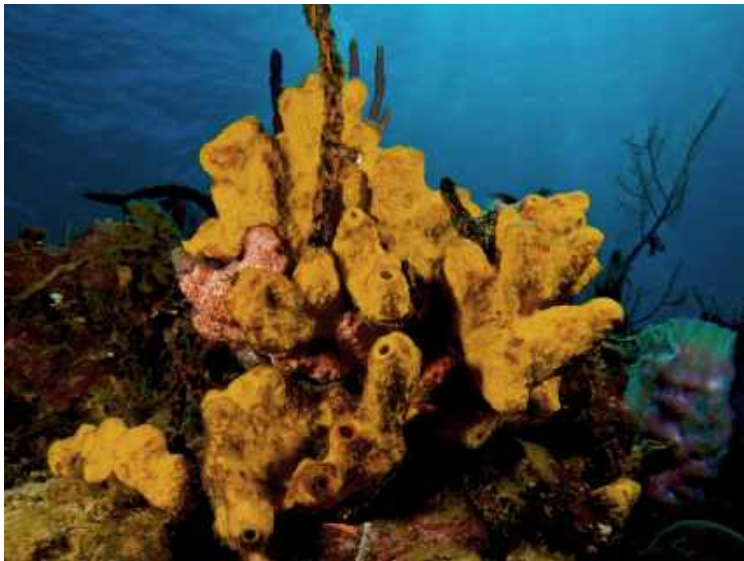


Symmetry Labels

<p>Bilateral (or Reflectional) Symmetry</p>	<p>Radial (or Rotational) Symmetry</p>	<p>Asymmetrical</p>
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Picture Examples







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Activity 2: Creating Symmetrical Sun Prints

What you need:

- Sun print paper (also called ‘cyanotype’ paper)
- Clear plastic panel (e.g., overhead projector transparency sheet)
- Plastic tub
- Water
- Sunlight
- Natural objects for designing your print (e.g., leaves, flowers, etc.)

Follow the steps below to make a beautiful symmetrical design using natural objects!

Preparation

1. Gather your materials.
2. Fill the plastic tub with water.
3. Important: Keep your sun print paper out of direct sunlight until you wish to create your design!

What to do

1. Arrange your natural objects, such as leaves and flowers, on the sun print paper in a symmetrical pattern (either bilateral/reflectional or radial/rotational).
2. Then place the clear plastic panel on top. You may need to use stones to hold the panel on top of the objects and paper on a windy day.
3. Place the arrangement in direct sunlight for about 10 minutes (up to 30 minutes on cloudy days).
4. After the necessary time has passed, remove the plastic panel and then carefully rinse the sun print paper in the tub with water for 1-5 minutes.
5. Allow the sun print paper to fully dry. If your paper curls once it is dry, you can flatten it by placing a heavy book on it for 24 hours.



Image from buggyandbuddy.com

What is happening?

You want to keep the sun print paper out of direct sunlight until you’re ready to make your design, because the paper begins to absorb UV light from the sun immediately. The color molecules in this special paper are sensitive to UV rays. While making your design, the areas exposed to sunlight will fade due to a molecular reaction called a “redox” reaction (oxidation by reducing an atom’s electrons), causing the exposed iron molecules to change color and bind with the paper fibers. During rinsing, the unexposed iron molecules rinse away because they are water soluble! If you live in an area with very little sunlight, you can use a fluorescent light for the same effect - although exposure time will vary.