

Symmetrical Cube Designs

Reporting Category Geometry

Topic Identify and create lines of symmetry

Primary SOL 2.15 The student will

- a) draw a line of symmetry in a figure; and
- b) identify and create figures with at least one line of symmetry.

Materials

- Symmetrical Sort Cards (attached)
- One-inch cubes
- Symmetrical Design Grid (attached)
- Music to play
- Crayons

Vocabulary

line of symmetry, symmetrical, unsymmetrical

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Distribute Symmetrical Sort Cards, one to each student. Ask each student to determine whether his/her image has a line of symmetry and if it does, draw it. Create a T-chart on the board with the two sides labeled Symmetrical and Unsymmetrical. Ask each student to come up and place his/her sort card image in the appropriate category. Have the class decide whether the placement is correct.
2. Ask students to write a definition of the word *symmetry*, and then have them share their definitions. Have students collaboratively create a class definition, and post it on the board. Use examples from the sort.
3. Explain that students will get to make symmetrical designs today, using one-inch cubes. Give each student a copy of the Symmetrical Design Grid with a line of symmetry drawn vertically down the center, a set of one-inch cubes, and crayons. Direct each student to create, when you play music, half of a design on one side of the line, using the cubes. Play the music, and tell students to begin. Stop the music, and tell students to move away from their designs to other students' designs. Play the music again, and have each student use cubes to make the design in front of him/her symmetrical by completing a mirror image of the design on the other side of the line. When the designs are symmetrical, have students use crayons to record the entire symmetrical image.
4. Repeat step 3 as many times as needed during the class period.
5. To conclude, ask each student to select one of the designs he/she recorded and to trace the line of symmetry with a finger. Pose the question, "Does this design have more than one line of symmetry?" Discuss their responses. If they find other lines of symmetry, have them draw the lines with a crayon.

Assessment

- **Questions**
 - Does a given design have more than one line of symmetry?
 - What would you have to change in a given design to make it symmetrical?
- **Journal/Writing Prompts**
 - Draw a picture of your teacher and explain whether he or she is symmetrical or not.
 - Draw a picture of an animal that is symmetrical, and show the line of symmetry. Does it have more than one line of symmetry?
- **Other**
 - Use the recorded designs as an informal assessment.

Extensions and Connections (for all students)

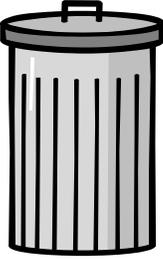
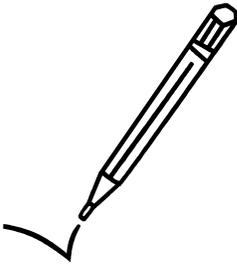
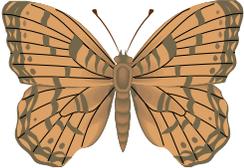
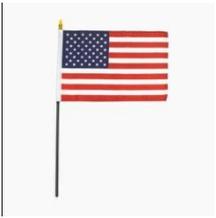
- Have students bring in one object from home that is symmetrical and one object that is not symmetrical. Do a class sort of the objects. Use tape to show lines of symmetry.
- Challenge students to find an object in the room that has multiple lines of symmetry.
- Find lines of symmetry in pattern block shapes. Then, order the shapes from the least lines of symmetry to the most lines of symmetry.

Strategies for Differentiation

- Group students in pairs, and repeat the activity as follows: One partner places one cube on his/her side of the line, and then the other partner must match it on the other side. They continue creating the symmetrical design, one cube at a time.
- Give students sheets of one-inch grid paper with a diagonal line drawn on it. Challenge them to create symmetrical designs, using the diagonal line as the line of symmetry.

Symmetrical Sort Cards

Copy cards on cardstock, and cut apart on the dotted lines.

Symmetrical Design Grid

