Symmetry is everywhere, but it's often hard to notice. This lesson explores a few ways to identify it. By folding and making mirror images for different shapes, students will discover a new world of symmetrical figures.

**Learning Objectives**

Students will be able to identify symmetrical figures, draw lines of symmetry, and explain why or why not a figure has symmetry.

**Materials and Preparation**

- Large image of a butterfly with outstretched wings
- Heart, triangle, and square cut from construction paper
- Small hand mirrors
- Brightly colored pieces of yarn (each approximately four inches in length)
- Sandwich bags containing different symmetrical and non-symmetrical shapes cut from white paper
- Lined paper

**Key Terms:**

- symmetry
- line of symmetry
Lesson

Introduction *(5 minutes)*

- Display the image of the butterfly.
- Ask the class to share some things they notice about the image. Some guiding questions you could ask are: *What are the colors of the butterfly's wings? How are the wings shaped?*
- Once students touch on the idea that the wings match in some way, introduce the word "symmetry." Explain that something has **symmetry** if it can be split into two mirror-image halves. For example, a butterfly is symmetrical because you can fold a picture of it in half and see that both sides match.

Explicit Instruction/Teacher Modeling *(10 minutes)*

- Let your students know that the next activity will involve using a mirror to check figures for symmetry. Model the checking process before having students begin the activity.
- Hold up the construction paper heart, then hold up a mirror across its center to reflect its left half. Lift the mirror and ask students whether the reflection matches what's behind the mirror.
- Think aloud to confirm whether the figure is symmetrical. Ask and answer the following questions: *The right half seems to match the reflection of the left half, but would the two halves match if I were to fold it? Are the two halves the same size and shape?* If the answer is yes for both, then the heart is symmetrical.
- Check for symmetry in other directions by holding the mirror across different parts of the heart and repeating the process of thinking aloud.
- Show the class that the heart is only symmetrical in one direction. Fold the heart vertically and horizontally to show where the halves match and do not match.
- Place a piece of bright colored yarn across the vertical fold. Explain that the piece of yarn, which marks where you held the mirror and made the proper fold, represents the heart's **line of symmetry**.
- Refer back to the butterfly image and show how the butterfly's line of symmetry runs vertically down the middle of its body.
- Repeat the modeling process for the triangle and square, placing pieces of yarn across their lines of symmetry.

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Guided Practice/Interactive Modeling \( (15 \text{ minutes}) \)

- Organize your students into groups of 2-3 students. Give each group a hand mirror, a bag of shapes, and some yarn pieces.
- Have the groups repeat the process you modeled to check their shapes for symmetry.
- After about 10 minutes, pause the activity. Have different groups share what they've found thus far.
- As each shape is discussed, reinforce why it does or doesn't have symmetry.

Independent Working Time \( (10 \text{ minutes}) \)

- Have students continue the activity independently.

Extend

Differentiation

- **Enrichment:** Have advanced students examine more complicated figures during Independent Working Time. You can give each student half an image of a symmetrical figure found in nature (e.g. a leaf or flower) and ask him to draw the other half on a sheet of paper.
- **Support:** Help struggling students by folding some of their shapes for them. This will help them see where the line of symmetry usually lands.

Technology Integration

An interactive whiteboard may be used to display different shapes and draw lines of symmetry.

Related Books and/or Media

- **BOOK:** *Seeing Symmetry* by Loreen Leedy

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Review

Assessment *(5 minutes)*

- Distribute sheets of lined paper to the class.
- Have each student write three sentences defining symmetry and line of symmetry.
- Under those sentences, have students write whether they think a star would have symmetry. Remind them to explain their reasoning.

Review and Closing *(10 minutes)*

- Review the concept of symmetry once again, repeating its definition and demonstrating it using a symmetrical shape.
- Have students partner up and think of examples of symmetrical figures.
- Close the lesson by allowing volunteers to share examples given by their partners.