

Title: Origami

Topics: shapes, symmetry, history of origami

Related Disciplines: mathematics, art

Objectives:

- A. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line symmetric figures and draw lines of symmetry (CCSS.Math.4.G.3).
- B. Engage effectively in collaborative discussion.
- C. Identify characteristics and properties of two- and three-dimensional geometric shapes.
- D. Apply transformations and use symmetry to analyze mathematical situations.

Lesson:

A. Introduction (20 minutes)

1. Show a short video that introduces what origami is and provides a short history of the art form (<https://www.youtube.com/watch?v=w0lcsQnGk6c>). Be sure to read the text aloud to students because it moves fast across the screen.
2. Question for students:

Q: What do you think origami has to do with math?

A: Origami is made up of different shapes and angles. We can use origami figures as a tool for learning geometry.

3. Before leading students in creating their own origami figures, review some geometry vocabulary using the attached PowerPoint presentation.

Line of Symmetry:

Q: Where is the line of symmetry on the UFO?

Triangle:

Q: Can someone find another triangle on the dinosaur?

Polygons:

Q: Are these polygons regular or irregular?

Q: What kind of polygon is the red shape?

Q: How about the blue one?

Q: And the yellow one?

Angles:

Q: *What type of angle is outlined in purple?*

B. Class Project (60 minutes)

Materials: Square pieces of paper, document camera to model the origami folding, copies of worksheet titled "Origami Ladybug Geometry"

Steps:

Lead students in creating their own origami ladybugs using the attached PowerPoint presentation.

Step 1: Fold your paper in half to make a triangle.

Step 2: Fold the outside corners down, but leave a small gap in between to show the ladybug's body.

Step 3: Flip your ladybug over and fold the top point down. Flip the bug back over and fold only the very top of the point back over again.

Step 4: Lastly, we will round the body of the ladybug by tucking in some of the sharp corners. Bend back the two outside points on the wings and the point on the bottom of the bug's body.

Step 5: You can choose to add some spots to your ladybug if you'd like.

Step 6: Those who finish early can make origami whales or penguins.