Line of Symmetry

In this lesson students identify and draw the lines of symmetry by folding two-dimensional shapes. Folding a two-dimensional shape can help a student identify the lines of symmetry.

Opener

(5 min)

In today's lesson, the students learn to 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. Also, the students identify line-symmetric figures and draw lines of symmetry.

To begin the lesson, I give each student a sheet of copy paper. I ask the students to fold the sheet of paper in half horizontally. (I model this for the students with a sheet of paper.) What can you say about both parts of the paper? (I want the students to tell me that both parts of the paper are the exact same size.) Student response: 1) They look like a half. 2) They both are rectangles, 3) They are symmetrical.

Just to make sure that the other students understand, I ask this student, What do you mean when you say that they are symmetrical? Student response: They are the same on both sides. I let the students know that this is a line of symmetry. A line of symmetry is when a two-dimensional shape is folded and you get a mirror image of the other part. Can a shape have more than one line of symmetry? Student response: Yes. Let's find out.

Whole Class Discussion

(10 min)

To get the students to understand that a shape can have more than one line of symmetry, I have the students fold the piece of paper vertically. I tell the students that the paper must match up perfectly when they fold it. If it does, then that is a line of symmetry. The students now know that a shape can have more than one line of symmetry.

The Line of Symmetry slide deck is displayed on the Smart board. I use an example and a non-example of symmetry shown on slide 2 of the slide deck. There are two shapes with lines drawn through them. I want the students to tell me if these lines are lines of symmetry. We discuss that in a line of symmetry, whatever we see on one side, we need to see the exact same thing on the other side. I use the slide deck to explain that a shape can be divided in three different ways to find a line of symmetry: horizontally, vertically, and diagonally.

Skill Building/Exploration

(20 min)

I give the students practice on this skill by letting them work together. I find that collaborative learning is vital to the success of students. Students learn from each other by justifying their answers and critiquing the reasoning of others.

For this activity, students work collaboratively in pairs. Each pair has a bag of cut out shapes. They work together to find all of the lines of symmetry for the shapes. The shapes include: triangle, arrow, hexagon, trapezoid, parallelogram and pentagon.
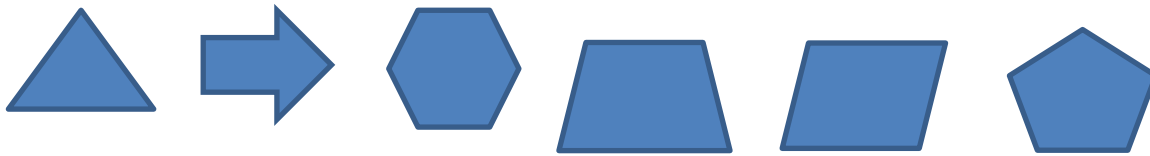
The students are guided to the conceptual understanding of symmetry through questioning. As students work through the shapes they justify their ideas to agree upon an answer. Examples of questioning include:

1. When you fold the shape, do you get a mirror image of the shape?

2. How many lines of symmetry does the shape have?

3. What can you do to find other lines of symmetry for the shape?
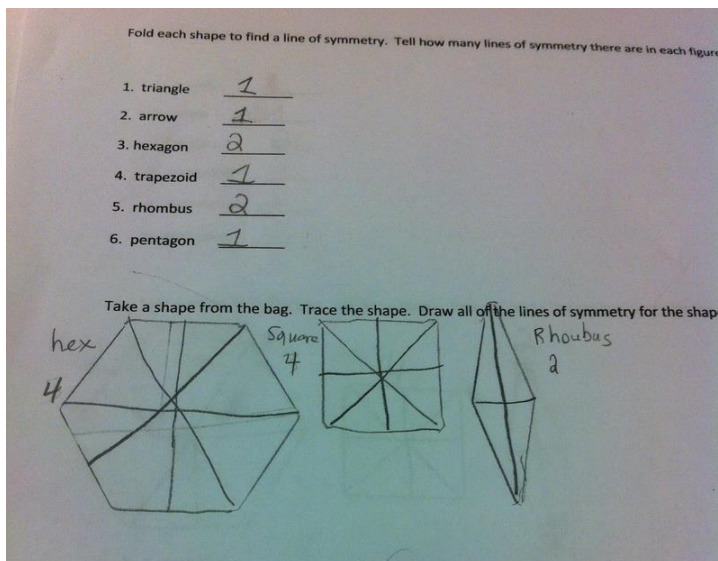
Student work sample

Closure
(15 min)

To close the lesson, I have students share their answers.   The students show how they folded their shapes in order to get a line of symmetry. I use this time to help students who may not fully understand symmetry using other student's examples. Students need to see good work samples as well as work that may have incorrect information, which we can discuss and correct.

Each student is given an Exit Ticket - Line of Symmetry to complete individually.

Results from exit ticket:

Only 6 students out of 16 students found the 2 lines of symmetry for the exit ticket. Most of the other students thought that there were 4 lines of symmetry for this shape. Even though the students did well during the lesson with the cut out shapes, we still have a lot of work to do on drawing lines of symmetry on a shape that we cannot fold.