"Reflection" Classroom Activities

Short description: Learn the meaning of the geometric term reflection and see several examples in this animated "Math Shorts" video.

Long description: In this animated "Math Shorts" video, learn about reflection, one type of movement for geometric shapes. The animation begins by relating the geometric meaning of reflection to its more common understanding—a mirror image—and then displays geometric shapes on a coordinate plane reflecting through the x and y axis. The animation also explains how to ensure that a shape has been correctly reflected and how to record the coordinates of a shape and its reflected image.

Activity Text

Learning Outcomes
Students will be able to
- reflect a polygon across a line of reflection
- indicate the coordinates of both the original polygon and the reflection

Common Core State Standards: 8.G.A.3, 8.G.A.1

Vocabulary: Reflection, line of reflection, coordinate grid

Materials: Graph paper, rulers, protractors

Procedure
1. Introduction (2 minutes, whole group)
Ask the students what it means for an object to reflect another one. Talk about mirrors, and how objects sitting in front of a mirror are reflected in the mirror itself. (The objects appear exactly the same, except that left and right are reversed.)

2. Video (8 minutes, whole group)
Show students the video. Call their attention to the idea of reflections on a coordinate grid. Tell them that this will relate to the activity that they will do.

3. Activity (15 minutes, individuals)
Hand out graph paper, a ruler, and a protractor to each student. Explain to students that they will design a geometric figure in one quadrant and then reflect it into at least one other quadrant. When students draw their polygons, they must indicate the coordinate of the vertices. They must do the same thing when drawing the reflections.

Tell students that they can earn points as follows by designing more complicated shapes or reflecting a shape into more quadrants:

- Polygon with 3–4 sides: +1 point
- Polygon with 5–8 sides: +2 points
- Polygon with 9+ sides: +3 points
- Polygon with at least one set of parallel lines: +1 point
- Measuring interior angles of the polygon and one of its reflections: +2 points
- Reflecting over either x = 0 or y = 0: *1 points
- Reflecting over both x = 0 and y = 0: *2 points
- Reflecting over either x = y or x = -y: *2 points

When students have completed the activity, they should tally their points and give their paper to a classmate for review. The classmate should check to see that the original shape has been accurately reflected across the different lines of reflection and that the coordinates are correct.

4. Conclusion (5 minutes, whole group)
Ask students whether the reflected polygon appeared stretched, smaller, larger, or in any way different than the original polygon. Then, ask about the angles within the reflected polygon: Are the angle measurements the same or different in the reflected shapes? Finish by bringing the conversation back to the idea of a mirror. In a reflection, the mirror just reflects what it sees. It does not distort shape or size. Geometric reflection works the same way.