

# Geometer Sketchpad #2

## Transformations

### Creating a Kaleidoscope

Directions:

Create Reflection Lines:

1. Using the segment tool, construct a segment that fills most of the screen.
2. While the segment is highlighted, choose “point on object” from the Construct Menu.
3. Using the pointer tool, select the line.
4. Choose “Rotate” from the Transform Menu.
5. Type in 60 where the pop-up screen asks for degrees.
6. Click “Rotate.”
7. Repeat steps 3 – 6 two more times, selecting the most recently constructed line each time.

Creating Object to Reflect:

1. Click in any blank space to make sure nothing is selected.
2. Choose the segment tool.
3. Create a polygon (it does not need to be a regular one) by creating a line segment then attaching another segment to the end of that one. To accomplish the “attaching,” click on an endpoint then move the mouse away and click again, you now have the next segment in your polygon.
4. End your polygon by attaching your last segment back to the first one. Just move the end of your last segment to the unused point of the first segment and click. Then choose the arrow tool.
5. To add color to your segment:
  - a. Select “preferences” from the Edit Menu.
  - b. Click on the “color” tab from the top of the Preferences pop-up screen.
  - c. Click on the color box next to the word “interiors.”
  - d. Choose the color you would like your polygon to be.
  - e. Click “ok.”
  - f. Click all of the vertices (end points) of your polygon.
  - g. Press Ctrl-P. This will add your color to your polygon.

To Reflect Your Polygon:

1. Click somewhere on the white space around your design.
2. Click the line segment to the left of your polygon.
3. Choose “Mark Mirror” from the Transform Menu.
4. Select all parts (vertices, lines, and color in center) of your polygon.
5. Choose “Reflect” from the Transform Menu.
6. Repeat steps 1 – 5 four more times.

Create as many polygons in different colors as you would like to create your own kaleidoscope.

How about a challenge...or two?

1. What happens if you use 45-degree rotations instead of 60-degree rotations? Try it.
2. Is there any other way you could rotate your objects? What happens if you translate instead of reflect?

When you are finished, save your kaleidoscope, you will put it in your portfolio at a later date.