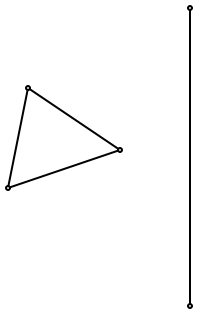
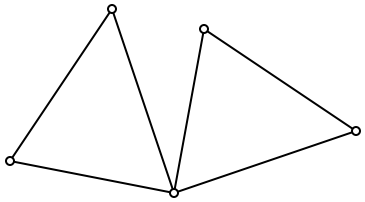
Tutorial

Have students construct a triangle (using three points and connecting them with segments) and have them draw a line segment (with the straightedge tool) next to their triangle.



Have students predict what their triangle will look like if they reflect it across that line. Next have students select their line segment and go to the **Transform** menu and **Mark Mirror**. Then have students select their triangle (they can select all components of the triangle or they can use the pointer tool and draw a box around the triangle and all of it will be selected). Then have students go to the **Transform** menu and select **Reflect**. Hopefully, their prediction will be correct!

Next have students pick a vertex on their triangle and select that point. Have them go to the **Transform** menu and **Mark Center**. Next have them select the entire triangle (as they did before) and go back to the **Transform** menu and choose **Rotate**. They will be prompted to enter an angle. Have them enter any angle measurement they choose. Now their shape should look something like this:



Have students explore this tool by entering different angles and selecting different vertices. Have students explore the program to figure out how to translate objects. This can be done several ways, but the best way to do this for tessellations is translating by a marked vector. Construct two points in Sketchpad and select them in the order you want an object to be translated, then go to the **Transform** menu and choose **Mark Vector**. Now you can draw an object and select the object, go to the **Transform** menu and choose **Translate**.

Hints

1. Have students look at the tessellations they created by hand at the beginning of class. Have them use their physical representations to figure out how to use transformations to tessellate in Sketchpad.
2. Have students explore the transformations using the midpoints of their shapes.
3. Look at the point in the center of the quadrilateral. All four colors meet at that point. Therefore at each vertex, all four colors must meet to be a total of 360°.