Making Tessellations

Learning Targets:
1. I can verify experimentally the properties of rotations, reflections, and translations. (8.G.1)
2. I can describe a sequence of rotations, reflections, and translations that exhibits congruence between two congruent figures. (8.G.2)
3. I can describe a sequence of rotations, reflections, translations, and dilations that exhibits the similarity between two similar two-dimensional figures. (8.G.4)

Materials:
- Grid paper, isometric dot paper, stiff paper, an angle ruler or protractor, transparent tape, and colored pencils or markers

Instructions:
- Draw square PQRS on grid paper.
- Draw triangle 1 as shown below.
- Draw triangle 1', the image of triangle 1 under a 270° rotation about point P.
- Draw triangle 2 as shown below.
- Draw triangle 2', the image of triangle 2 under a 270° rotation about point R.

Now you will start with a copy of a square PQRS and perform the same rotations as before. However, this time you will cut out triangles 1 and 2 and rotate the cut pieces.
- Copy square PQRS and triangles 1 and 2 onto a stiff sheet paper. Cut out square PQRS.
- Cut out triangle 1, and rotate it 270° about point P, and tape it place.
• Cut out triangle 2, rotate it 270° about point R, and tape it in place.

Trace copies of your finished shape to make a tessellation. Recall that a tessellation is a design made by fitting together copies of a basic shape without gaps or overlaps. You can decorate the basic shapes to make your tessellation more interesting.

We say that the shape below tessellates because it can be used to make a tessellation.

Start with a square, and try to make your own tessellating shape. Cut out pieces from the square, rotate them, and tape them in place. As you work, think about the question:

*Will any cutout shape and any rotation turn a square into a shape that tessellates?*

When you find a shape that tessellates trace it several times to make a tessellation. Tape your basic shape to the paper.

Now, see if you can make a tessellating shape from a rhombus with angles of 60° and 120°. You may find it easier to make your design on isometric dot paper and then cut out a copy from stiff paper. As you work, think about this question:

*Will any cutout shape and any rotation turn a rhombus with 60° and 120° angles into a shape that tessellates?*

If you find a shape that tessellates, trace it several times to make a tessellation. Tape you basic shape to the paper. If you were unable to make a shape that tessellates, explain why you think your efforts were unsuccessful.