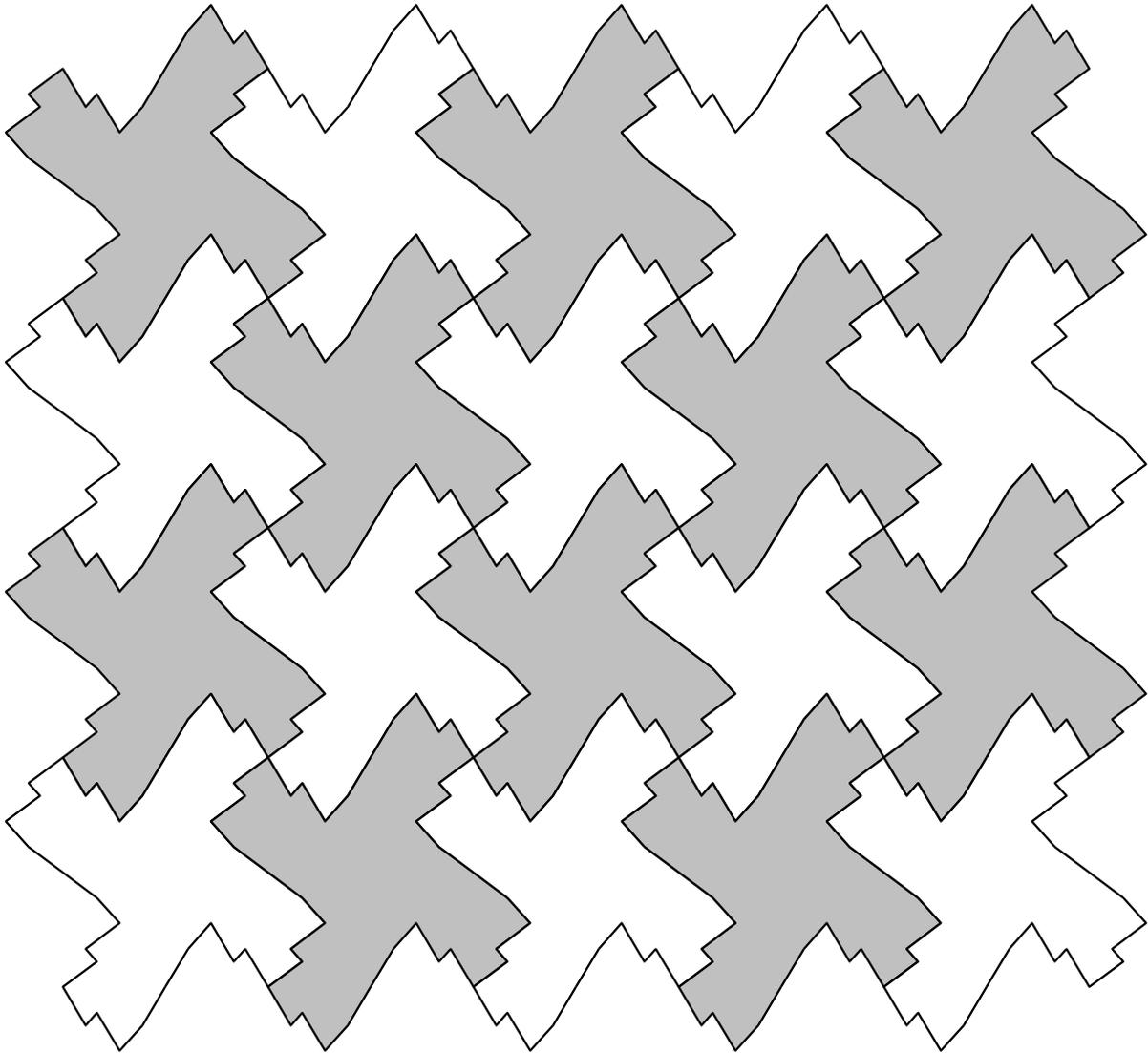


Tessellation Challenge

In this challenge, you will be investigating tessellations. Here's what we are talking about. Consider the pattern shown below.

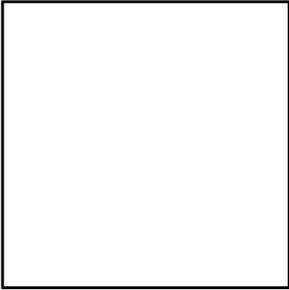


As you can see, it is made up of one basic shape that is repeated over and over. This shape can be used to completely fill a plane with no gaps. Shapes that do that are said to tessellate. The above pattern is called a tessellation. Color can be added to create beautiful designs. In this challenge, you will learn about three basic types of tessellations. They are called (1) translations, (2) slide reflections, and (3) rotations. They all start out using a square.

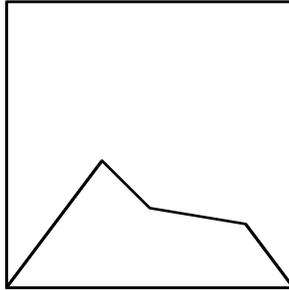
Tessellation Challenge page 2 Translations

Here is what you can do to create a tessellation called a translation.

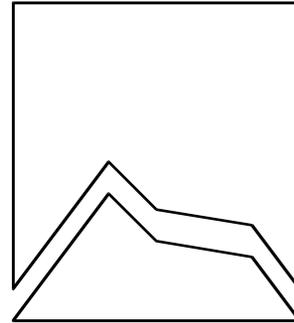
Step 1: Draw a square.



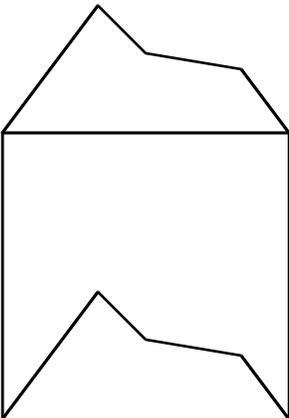
Step 2: Create a design on one end of the square.



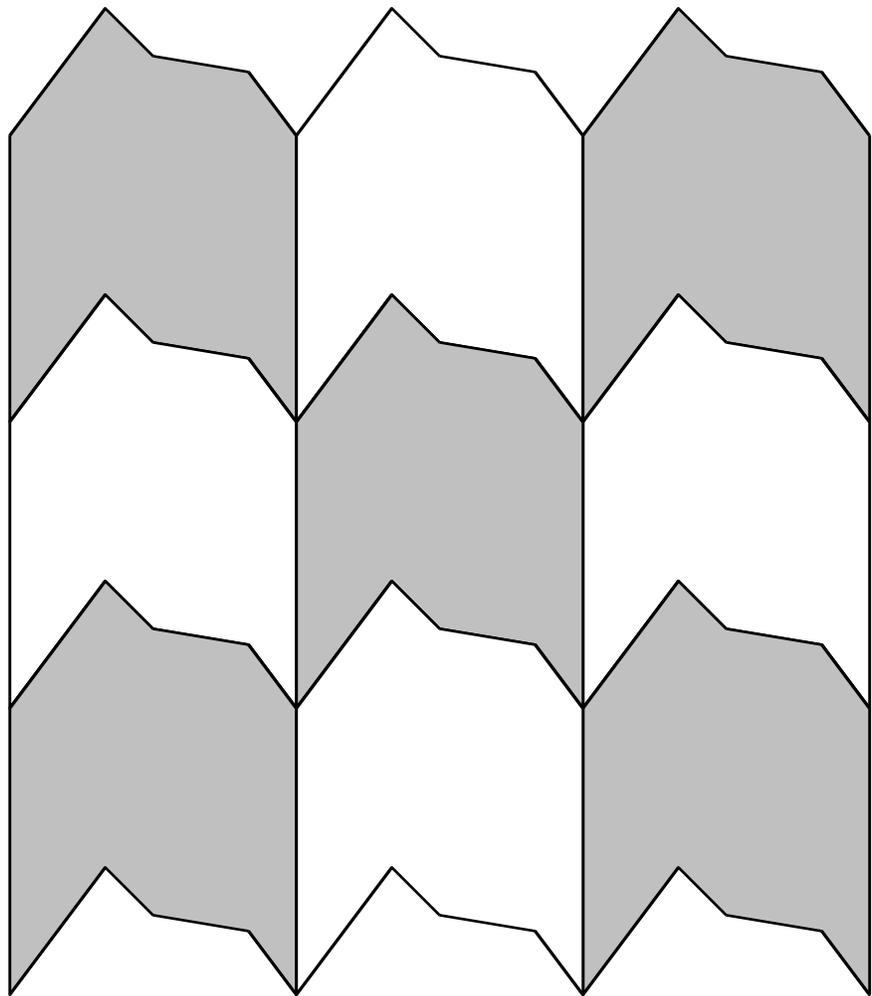
Step 3: Cut out your design.



Step 4: Slide the cut out part up to the other end of the square and tape the two pieces together.



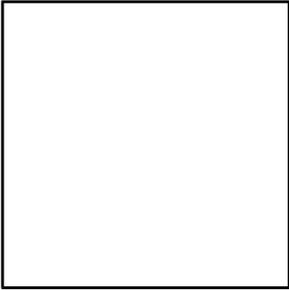
Step 5: This is your basic shape. You can use this as a pattern to completely fill a region. Your shape will tessellate. Color can be added as desired.



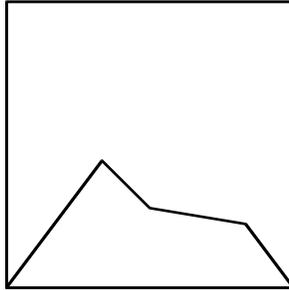
Tessellation Challenge page 3 Slide Reflections

Here is what you can do to create a tessellation called a slide reflection.

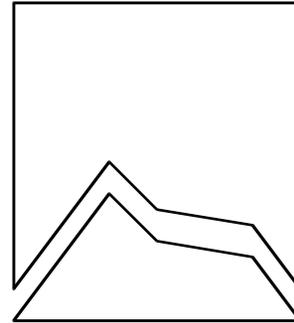
Step 1: Draw a square.



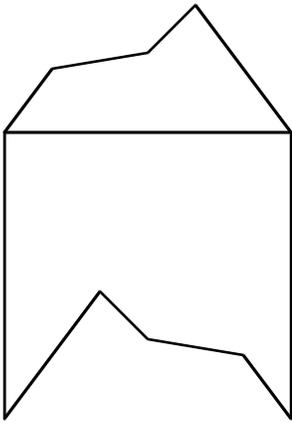
Step 2: Create a design on one end of the square.



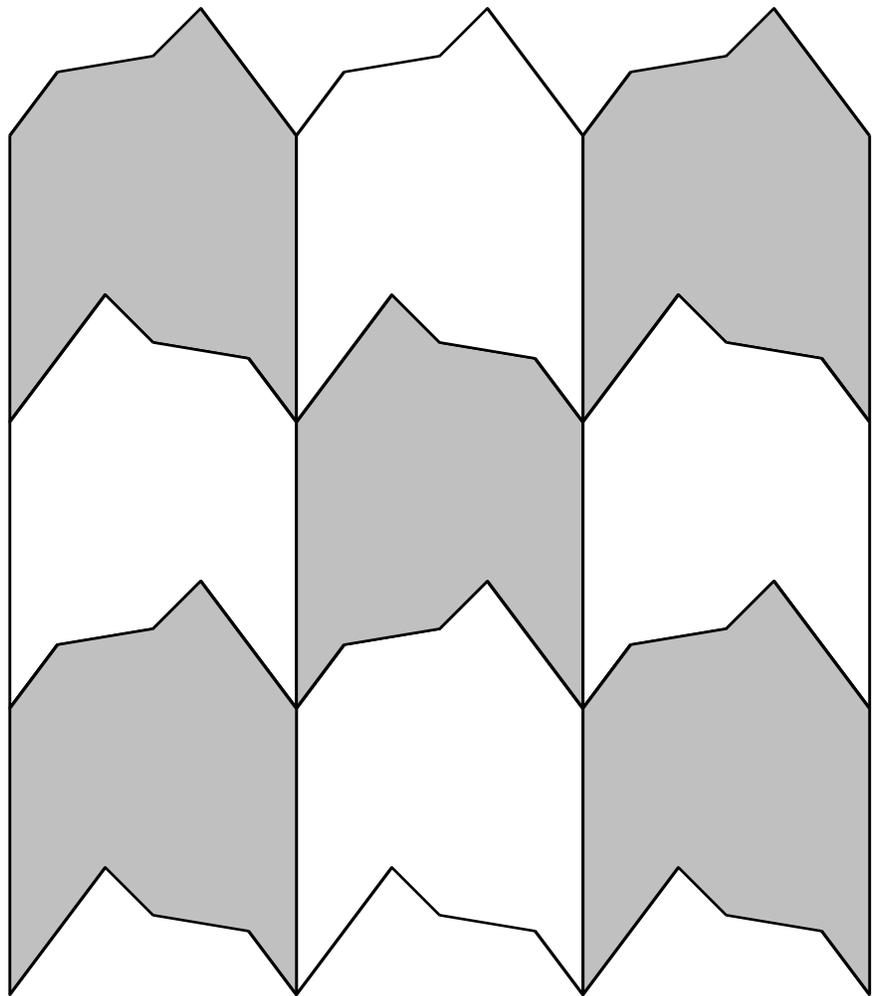
Step 3: Cut out your design.



Step 4: Slide the cut out part up to the other end of the square. As you move it, turn it over. Tape the two pieces together as shown.



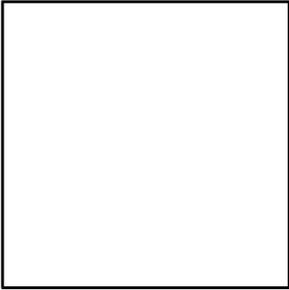
Step 5: This is your basic shape. You can use this as a pattern to completely fill a region. Your shape will tessellate. Color can be added as desired.



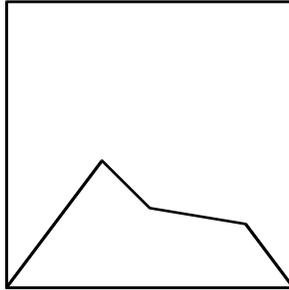
Tessellation Challenge page 4 Rotations

Here is what you can do to create a tessellation called a rotation.

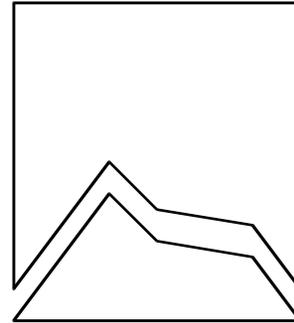
Step 1: Draw a square.



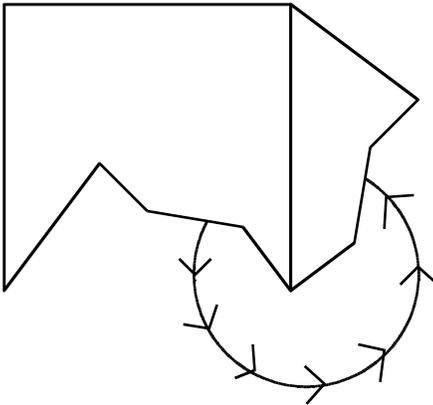
Step 2: Create a design on one end of the square.



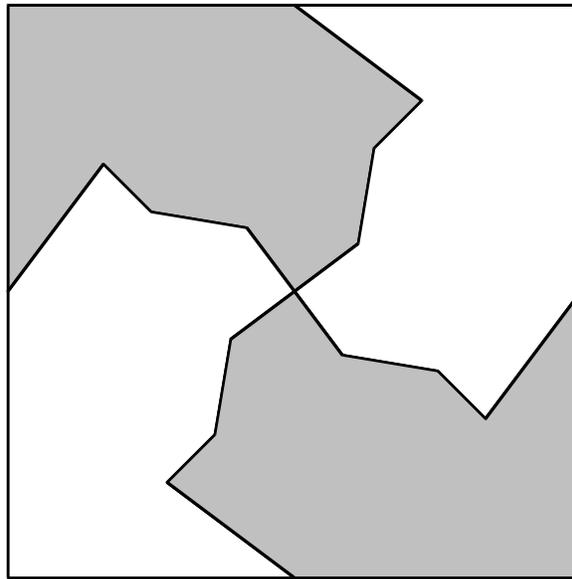
Step 3: Cut out your design.



Step 4: Rotate the cut out piece counter clockwise, as shown. Tape the two pieces together.



Step 5: This is your basic shape. You can use this as a pattern to completely fill a region. Your shape will tessellate. Color can be added as desired.



For this challenge, you must create a unique tessellation pattern using each one of these techniques. Each one should completely cover a region that is at least 10 inches long and at least 8 inches wide. Your final product must be colored. Of course, there are other ways to create patterns that will tessellate. Some of these begin with a rectangle (not a square). You may, if you chose, do this instead. In fact, you will receive a 10 points bonus if you do. Good luck in whatever you decide. You may collaborate with a classmate when you do this challenge. Your final pattern, however, must be unique.