

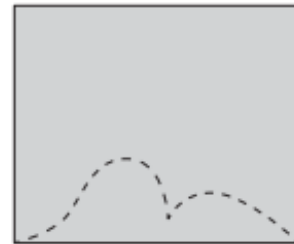
## A) TRANSLATION TESSELATION

### Try This:

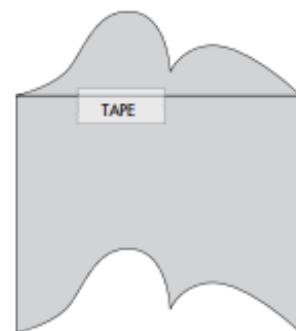
Step 1 Cut an index card in half, creating a 2.5" x 3" rectangle.

Step 2 Find the area of the rectangle (length x width).

Step 3 Draw a line between two adjacent corners on one of the long sides of the rectangle. Your line can be squiggly or made up of straight segments. Whatever its shape, your line must connect two corners that share one side of the rectangle.

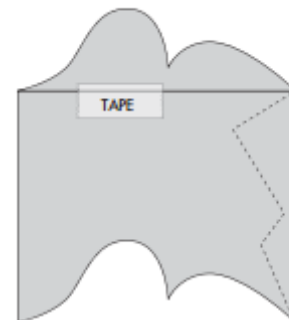


Step 4 Cut along the line you drew. Take the piece you cut off and slide it straight across to the opposite long side of the rectangle. Line up the long, straight edges of the two pieces and tape them together.



Step 5 Can you tessellate with this shape? Try tracing this shape several times, creating a row going across a piece of paper. Line up the cut edges of the shape as you trace it.

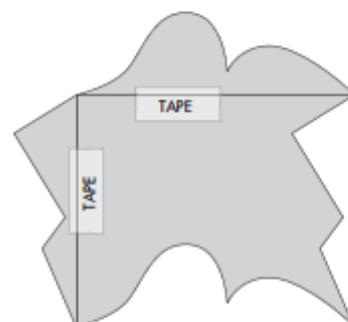
Step 6 Now draw another line that connects two adjacent corners on one of the short sides of the shape.



Step 7 Cut along this new line. Take the piece you cut off and slide it straight across to the opposite side of the shape. Line up the straight edges and tape them together.

Step 8 You have now created a shape that you can use as a pattern to make a tessellation.

What's the area of this shape? Write the letter A on one side of the shape and turn it over and write the letter B on the other side.

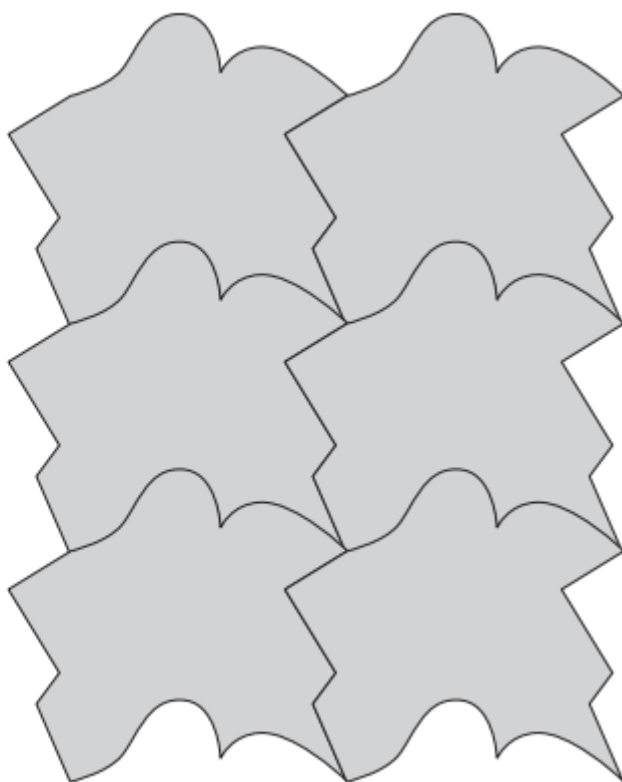


Step 9 On your grid paper, carefully trace around your pattern shape.

Can you figure out where to place the pattern so that your paper will be covered with repetitions of this shape with no overlaps and no gaps? Try to cover your whole sheet of paper by tracing the pattern, moving it, then tracing it again.

If you start with side A facing up do you ever have to turn it over to side B to make your tessellation? If you only have to slide the piece without flipping it over or rotating it, then you are making a *translation* tessellation.

In math, translation means shifting the position of a shape without moving it in any other way.



Step 10 Look for a clever way to color in the resulting design on your sheet of paper.

Does your shape look like a fish? A bird? An elephant?

Make a pattern with at least 9 (or more!) of the base pattern.

Mount it on construction paper if necessary.

### Going Further:

To view the work of M. C. Escher, go to:

<http://www.mcescher.com/Gallery/gallery-recogn.htm>

To see tessellations that other students have made, go to:

<http://www.worldofescher.com/contest/>

The site includes an ongoing contest for the best tessellation, and has a "Hall of Fame" that includes a number of tessellations by middle-schoolers.