

Tessellation Worksheet

1. You can create regular tessellations from which of the following polygons? (Recall that a regular tessellation is a tessellation in which there is only one shape that repeats.) Explain why or why not for each polygon.

Equilateral Triangle

Square

Regular Pentagon

Regular Hexagon

Regular Octagon

Regular Decagon

Regular Dodecagon

2. Create a tessellation by following the directions below:
 - a. Take a blank, unlined sheet of paper and cover the sheet with non-overlapping, touching squares either as squares or on point. Make sure that the sides of these squares are between $\frac{1}{2}$ inch and 2 inches long. Draw these squares in pencil.
 - b. Choose one square, which is located at or near the center of your sheet.
 - c. Draw a picture or design inside the square.
 - d. Tessellate this figure to the rest of the squares on your paper.
 - e. Color the figures as desired.

3. Create a tessellation by following the directions below:
 - a. Take a blank, unlined sheet of paper and cover the sheet with non-overlapping, touching equilateral triangles. Make sure that the sides of these triangles are between $\frac{1}{2}$ inch and 2 inches long. Draw these triangles in pencil.
 - b. Choose one triangle, which is located at or near the center of your sheet.
 - c. Start at one of the points of the triangle, and draw a squiggly line or a jagged line that ends at the center of the triangle.
 - d. Copy the line you just drew at each of the other two points of the triangle.
 - e. If you see a shape developing, you may want to draw the same squiggly or jagged line along each side of the triangle, which will make the shape more apparent. To make sure that your figure will still tessellate do the following:
 - i. From one end of the side to the midpoint of the side, draw your wiggly line however you want.
 - ii. Copy a reflection of the wiggly line you just drew on the second half of the side. This means that the parts that were outside the triangle on the first half of the line are now on the inside of the line and visa versa.
 - f. Add details to the figure you just made in the “triangle.”
 - g. Tessellate this figure to the rest of the triangles on your paper.
 - h. Color the figures as desired.

4. Create a tessellation by following the directions below:
 - a. Take a blank, unlined sheet of paper and cover the sheet with non-overlapping, touching squares as either squares or squares on point (choose the way that is opposite to what you chose in problem number 2). Make sure that the sides of these squares are between $\frac{1}{2}$ inch and 2 inches long. Draw these squares in pencil.
 - b. Choose one square, which is located at or near the center of your sheet.
 - c. Pick one of the sides of your square.
 - d. Draw a squiggly line or a jagged line from one end of the side to the other.
 - e. Pick another side of the square and copy the line you just drew on that new side.
 - f. On one of the remaining two sides, draw another squiggly line or a jagged line from one end of the side to the other.
 - g. Copy the line you just drew on the remaining side.
 - h. Erase the original straight lines of the square.
 - i. Draw lines as needed inside the “square” to create a figure such as a fish, cat, house, or weird-looking blob.
 - j. Tessellate this figure to the rest of the squares on your paper.
 - k. Color the figures as desired.

5. Use what you have learned so far to create **your own** tessellation, which is not made up of just one type of polygon. The following are suggestions you may want to follow:
 - a. Choose a figure or figures which you would like to tessellate such as a frog, a bird, a butterfly, or a tree. Make sure that the object is symmetric or partially symmetric.
 - b. Take a detailed picture of the object you chose and simplify the lines. (In artistic terms, think cubism).
 - c. Superimpose your figure on a polygon, which can be tessellated.
 - d. Adjust your figure so that it tessellates. For example if you chose a lizard, you may have to turn its head or move its tail. You may find that you need to use an additional figure. Recall in some of the animal tessellation examples used 2 or 3 or more animals.
 - e. Add details to your figure and tessellate it.