

# Fill-in Fractal

A fractal is a geometric shape that has a never-ending repeating pattern. Many famous fractals are self-similar, which means that they consist of smaller copies of themselves. They contain patterns at every level of magnification and can be created by repeating a procedure or iterating an equation infinitely.

A shape does not have to be exactly identical to be classified as a fractal. Instead shapes that display inherent and repeating similarities are the main requirement for being classified as a fractal.

## Materials

- A sheet of paper
- Pencil and/or pen in different colors
- Ruler

## Instructions

1. Draw an equilateral triangle
2. Draw a point in the middle of each of the three sides of the triangle, & then connect those points to form a new triangle.
3. Repeat Step Two for the outer three triangles, drawing a point in the middle of each of the sides & connecting the points to form a new triangle.
4. Each time we repeat step 2 is called an iteration, or how many times we've repeated the same operation. We now have a big triangle in the middle pointing down, and 3 smaller ones pointing down. If we continue to repeat step 2, however, we would draw a point in the middle of each side of the 9 triangles pointing up and connect those points to form new triangles, repeating the process for each of the newly created triangles that are pointing up. If you want to stop here, color each of the triangles pointing up black, and leave the triangles pointing down white.
5. Challenge: How many iterations can you do?

