



Sponge, coral, and soft coral.
Courtesy Florida Keys National Marine Sanctuary

Now THAT's Complex!

A habitat is a place where an animal or plant lives and grows. How many habitats do you see in this picture? There are thousands! This is because the branched and wrinkled shape of the sponges and corals produce many different spaces of many sizes that can provide shelter to other organisms. The variety of habitats found on coral reefs is one of the reasons that a square foot of coral reef supports more species than any other marine environment.

Here's a way to show how coral reefs create a wide variety of habitats by repeatedly dividing a space into smaller and smaller pieces.

What You Will Need:

- Colored pencils or fine-point markers
- Ruler
- Copy of "Triangle Graph Paper"

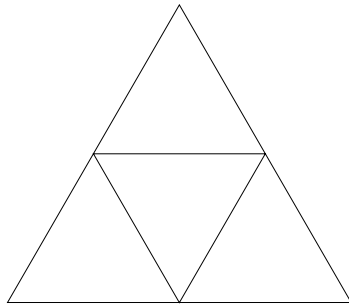
What You Will Do

Make a Sierpinski triangle that shows how repeatedly dividing a fixed space produces an infinite series of increasingly smaller spaces.

How to Do It:

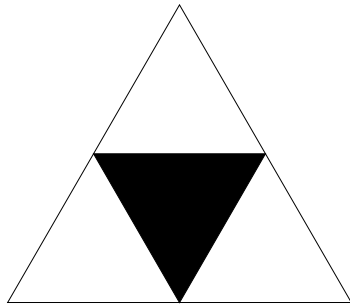
1. Begin by drawing an equilateral triangle measuring 16 cm on each side. This triangle is drawn in red on the "Triangle Graph Paper."
2. Find the midpoint of each side (8 cm), and join these midpoints as shown in Step 1.

Step 1



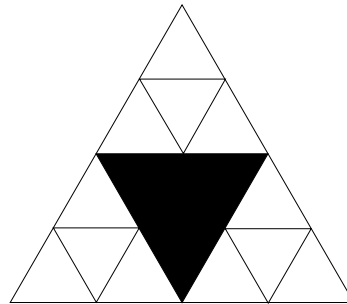
3. Shade the triangle in the middle as shown in Step 2.

Step 2



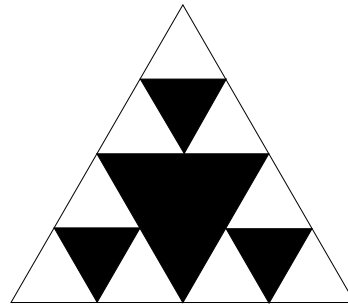
4. Find the midpoints of each side of the three outer triangles (4 cm), and join these as shown in Step 3.

Step 3



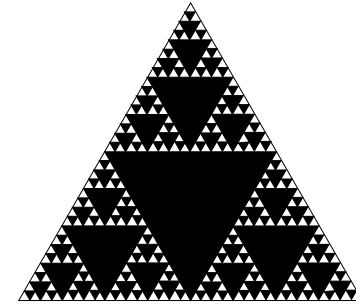
5. Shade each of the middle triangles as shown in Step 4.

Step 4



6. Continue this process three more times, until the midpoints measure 0.5 cm, shading the middle triangles each time, until the drawing appears similar to Step 5. You have made many different-size "habitats," simply by dividing the space over and over again. Theoretically, you could continue this process indefinitely to make an infinite number of habitats!

Step 5



Want to Do More?

The Sierpinski Triangle is an example of fractals, which are geometric figures that have special properties and are often found in nature. For more information about fractals, visit <http://math.rice.edu/~lanius/frac/>.

This activity was adapted from "Architects of Seamount Ecosystems" (6 pages, 300k) by Mel Goodwin, The Harmony Project, Charleston, SC; from the Ocean Explorer 2004 Gulf of Alaska Seamount Expedition <http://www.oceanexplorer.noaa.gov/explorations/04alaska/background/edu/media/GOA04.Form.pdf>

Triangle Graph Paper

