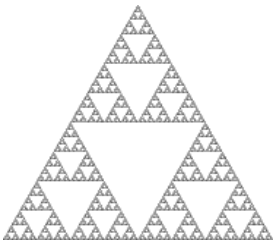
Fractal Scavenger Hunt!

What is a fractal?

A fractal is a never-ending pattern, or a pattern that can be seen repeating itself over and over as you look more closely. From oxford dictionary it is “a geometric figure each part of which has the same statistical character as the whole”. Fractals are images where the proportions look exactly the same but the scale of the pattern or image gets smaller and smaller.

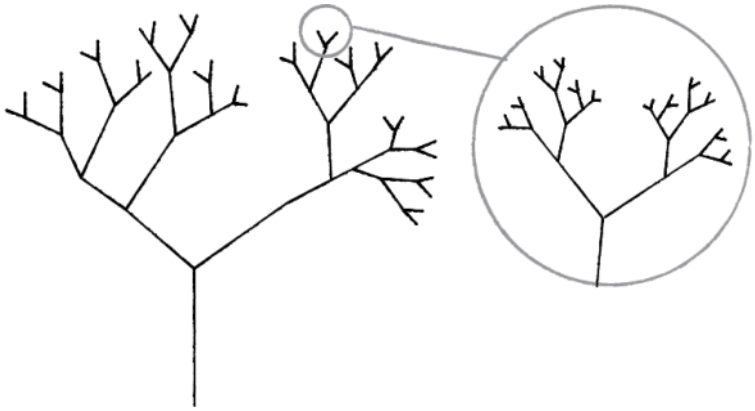
Examples:



This image of triangles is a fractal because as you zoom in on the photo you will see a copy of the original image, the scale just keeps getting smaller.

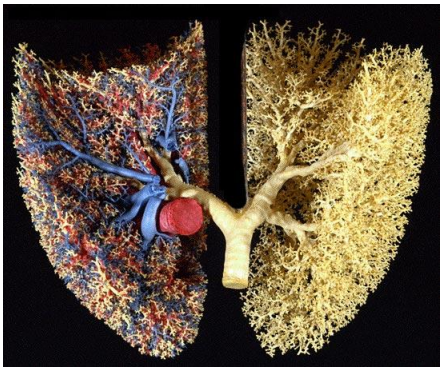
Examples of fractals in nature:

Trees: Trees are fractals because the shape of the whole tree from a distance is mimicked as you look closer at the branches. Each branch can be seen as a mini tree. The angle of the branches are exactly the same.



Leaves: Ferns are fractals because each leaf of a fern resembles the whole fern itself. Additionally, the pattern of the veins on a leaf are fractals because the veins on the entire leaf contain a similar pattern to the veins when you look with a microscope.

Human Lungs: Our lungs are also fractals because the shape of them as a whole looks like the shape when you look more closely. It is also interesting to note that lungs resemble trees! Both are used to convert oxygen to carbon dioxide and vice versa.



Romanesco, Broccoli, & Cauliflower: Broccoli and Cauliflower are both fractals because the whole vegetable resembles each piece when you cut it up smaller and smaller. Romanesco is an especially cool fractal because the pattern of spirals keeps repeating itself on smaller and smaller scales.

Nautilus shell: These shells are fractals because the whole shell itself has the same pattern as the smaller parts of the shell as you look closer. Each angle is the exact same measurement which creates a pattern over and over.

Sunflower: The pattern of sunflower seeds on a sunflower is a fractal because the seeds are created in the same way. The first seed was created then it rotates by a certain consistent angle to create another seed. This is related to the Fibonacci sequence which is a mathematical sequence that is created by a pattern by adding the last two numbers in the sequence. Ex. 1,1,2,3,5,8,13,21,34,55… etc.

Bark and Rocks: Some patterns on bark and in rock formations can also be fractals.

Pine Cones: Pine cones also display fractal patterns.

Activity:

There are many examples of fractals in nature! Now we will explore the garden/ island to try to find examples of fractals in real life. Draw a picture of the fractals you find and describe why they are fractals.

Name: _____

Fractals in Nature

Explore the area to find examples of fractals you can see in nature. Draw a picture of the item and explain how it is a fractal.
