

Fractals:

Part 1

Fractals are an important concept to understand when studying Reform Lines. In order to understand fractals and their importance when studying Reform Lines, we need to define the word “Fractal”.

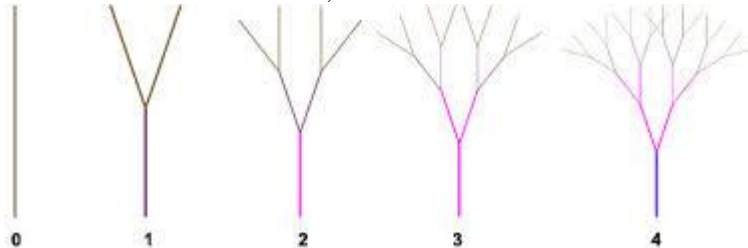
Fractal

- any of various extremely irregular curves or shapes for which any suitably **chosen part is similar in shape to a given larger or smaller part** when magnified or reduced to the same size
- a mathematical set that has a non-integer and constant Hausdorff dimension; a geometric figure that is **self-similar at all scales**

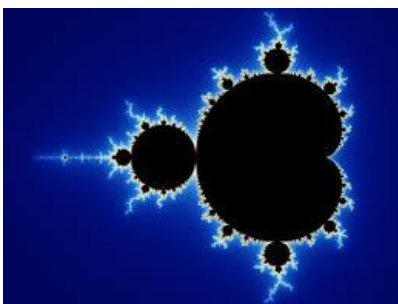
Based on the definitions above, we see that the word “fractal”, is connected to the idea of a **pattern or structure that occurs at different scales.**

There are different types of fractals. They all follow the principle of a pattern that occurs at different scales. However, the different types of fractals have small differences. The different types include:

- **Exact self-similarity:** This is the strongest type of self-similarity; **the fractal appears identical at different scales**, such as the Fractal Tree.



- **Quasi self-similarity:** This is a loose form of self-similarity; **the fractal appears approximately (but not exactly) identical at different scales.** Quasi-self-similar fractals **contain small copies of the entire fractal in distorted and degenerate forms.** e.g., the Mandelbrot set's satellites are approximations of the entire set, but not exact copies.



- **Statistical self-similarity:** This is the weakest type of self-similarity; **the fractal has numerical or statistical measures which are preserved across scales.** Most reasonable definitions of "fractal" trivially imply some form of statistical self-similarity. Random fractals are examples of fractals which are statistically self-similar, but neither exactly nor quasi-self-similar.

<https://en.wikipedia.org/wiki/fractals>

When studying Fractals in connection to Reform Lines, we will notice that **the pattern, or structure of the Reform Line - 5 key waymarks, and 4 dispensations - will be repeated at different scales.** However, the Fractals that are connected to Reform lines, are **Quasi self-similar fractals** and **not Exact self-similar fractals.**

Questions

1. Define the word Fractal.
2. Explain Why Fractals are important when studying Reform Lines.
3. Explain the phrase “Quasi self-similar fractal” in your own way.
4. Explain why Fractals that are connected to Reform Lines are Quasi self-similar fractals and not Exact self-similar fractals.
5. Draw the Reform Line of the 144000, as well as a fractal of it. Overlay the agricultural model on top of both Reform Lines.

Activity

Draw a fractal