

Grade Five -DaVinci Kids
<http://goo.gl/WiHMTc>

Big Idea: What can patterns in the natural world tell us about environment?
All patterns are data.

Guiding Questions:

Why should we pay attention to changing patterns in nature?
How was DaVinci Impacted by Nature in his designs?
How have patterns in nature impacted innovation of today?

Guiding Teaching Methods:

Inquiry: Using co-created Inquiry questions as well as a collaborative investigation of Fractals, students will have an opportunity to narrow down a specific choice relating to the Big Idea.

Design Thinking: Students will dive into the math concepts and design of Fractals and use an algebraic expression to discover the design nature of the pattern and relate this 'discovery' to the big idea. Students will access a variety of ways to represent and Design the Fractal pattern, from food art, using Pulses (beans, seeds), drawing and using Minecraft.

Problem Based Learning: Students will make connections to how patterns in nature and data play an important role in how we solve problems. They will find Fractals themselves and draw conclusions about how the data of the particular Fractal can tell them something/inform them.

Reggio:

Pre-Information: https://docs.google.com/document/d/1o-dga_C5zffSIg5_jQA5JJBWtTDhIGwgje-UZogF9M4/edit

Provocation:

<https://docs.google.com/presentation/d/1mUuvNRecz4JJpb11xJfVedNp54XzdfJs91QwIAroFHE/edit?usp=sharing>

Post-Information and follow up

https://docs.google.com/document/d/1xZJKclnRmsL1ZxpQ1aSo4SWTOILR38P9-Zf_fVEWB7Q/edit

Overview of the topic, Background

Fractals are designs that repeat the same design by creating smaller, self-similar images of itself. Benoit Mandelbrot is known as the "Father of Fractals". He discovered the Fractal pattern in nature and devised a mathematical equation to represent the pattern.

Questions for students (Minds on Topic):

https://docs.google.com/document/d/1eEkECHG5yh7PKx3bm_W6phEYcVZg7jNwpTVaVvP7xKM/edit

Lesson Sequence:

Schedule for day:

https://docs.google.com/document/d/1Oyz-gpVfYfB1BWf5WqU6_YhP7IQgUN9RYHRPqNWyOGE/edit

-
- 1) Sign into computers as preparation for day
(ensure students can access the Hub, Email, Google Drive)
- 2) Explore: Fractal Activities(Self-Directed as they arrive).
-
- 3) 10:00 Introduction to lesson inquiry/Big Idea in Kitchen:**
- the patterns (we can see the patterns in data) of eating in North America related to eating pulses and sustainable living
-
- 4) 10:20 - 10:40
Minds-On Investigation -Whole Group at Computers/
- Information Scavenger Hunt
https://docs.google.com/document/d/1eEkECHG5yh7PKx3bm_W6phEYcVZg7jNwpTVaVvP7xKM/edit?usp=sharing
 - <https://goo.gl/PBdqtd>
-
- 5) 10:40 - 11:00
Kahoot <https://getkahoot.com/>
- Discussion/Facts
-
- 6) Snack
- 7) Provocation/Video/Information (20 Minutes)
- <https://docs.google.com/presentation/d/1mUuvNRecz4JJpb11xJfVedNp54XzdfJs91QwIAroFHE/edit?usp=sharing>
 - Video**Mandelbrot Set 21:18 <http://youtu.be/3yE4d7O17wE>
-
- 8) 11:30 - 12:15
Activities: Split into two groups
Kristy: Math Wau
(<https://www.khanacademy.org/math/recreational-math/vi-hart/vi-cool-stuff/v/wau-the-most-amazing-ancient-and-singular-number>)
Connect to Pi, Phi and Wau
- OR Fractal Fractions Math
<https://www.khanacademy.org/math/recreational-math/vi-hart/vi-cool-stuff/v/fractal-fractions>

Zoe: Inquiry Questions/Literacy at Computer

<https://goo.gl/thTd37>

- What makes a Fractal?
- Students will take research 1-2 important examples of Fractals in Nature. They will later have an opportunity to recreate these fractals in their own way using another tool.
- Students will share their work using a collaborative book format:

http://www.fractaluniverse.org/v2/?page_id=83

9) LUNCH 12:15 - 12:45

- Fractal in Food... a little fun! <https://www.youtube.com/watch?v=yRD1DFkNh4A>
- [Art Examples](#)

10) Questions/Inquiry - Collaborative

<https://docs.google.com/document/d/1luk5xlw4fkM9mhPwYzs3qhm4WPQSxFTBJ7Lrapq8WXM/edit>

https://docs.google.com/document/d/1o0cT7IWhRpIPff9h3DT9t2PbIVZFG0_talVXpYtY4R0/edit

11) FRACTAL - MAKER (Applying Art/Assessment)

- in Minecraft
 - Pulse Art
 - Drawing
 - Coding
-

Fractal Collaborative Book

Example

https://docs.google.com/presentation/d/1G2f7HESavrRNif4SwwgpCjtYXDKY5ANqlk_RXeTKmBE/edit#slide=id.g7bdc33735_0110

Resources:

<http://www.demilked.com/amazing-nature-patterns/> Earths most stunning Fractal Patterns:

<http://www.wired.com/2010/09/fractal-patterns-in-nature/>

<http://fractalfoundation.org/resources/fractal-trianglethon/>