FLOWER FUNCTIONS

AFTER 2: Fibonacci- Numbers in Nature

Background: "Numbers in Nature" explores the Fibonacci sequence as found in nature. This website, http://www.maths.surrey.ac.uk/hosted-sites/R.Knott/Fibonacci/fibnat.html#section3 is a nice reference for learning about the Fibonacci sequence. This activity integrates math and science. Through careful observations, students notice mathematical patterns and sequences in nature!

VA Standards Addressed: Math 4.15

Preparation: Collect or purchase pine cones. (Remember to ask permission if looking for cones on public or private land.) This activity does not work with every species of pine; test your cones before collecting or buying. On the website, you can view the spirals drawn in both directions. You might also use pineapples or flowers. Keep in mind: it is best to use native flowers rather than cultivars that are altered by humans.

Instructional Strategy:

1. Hook with the video found here:
    https://www.youtube.com/watch?v=P0tLbl5LrJ8
2. Instruct students to explore the pattern in their small groups. The Fibonacci sequence (named for the Italian mathematician Leonardo of Pisa who lived from about 1170-1240 A.D.) is: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144…
3. Ask the students to describe the pattern they find using mathematical language. Each subsequent number is equal to the sum of the previous two numbers of the sequence. Ask: In this sequence, the next number would be…?

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Numbers in Nature Student Page

Practicing Fibonacci:

Fibonacci sequences appear in nature, such as the branches of trees, leaf arrangement on a stem, the fruitlets of a pineapple, flower petal numbers, an uncurling fern, a snail shell, and the arrangement of scales on a pine cone.

Look at your pinecone. Use a pencil to trace the spirals from the base of the cone (where it connects to a branch).

How many spirals did you count?

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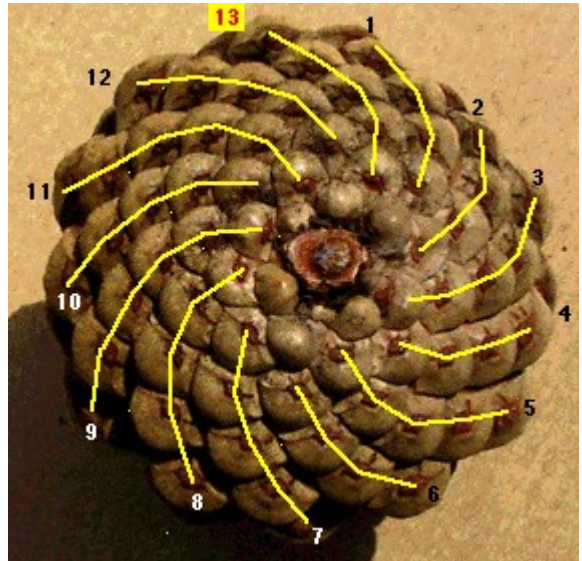
Now, trace the spirals in the opposite direction. Now count them. How many did you count?

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Do these numbers "fit" the Fibonacci sequence? Explain your reasoning.

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Extending Fibonacci:

Look for the Fibonacci numbers in other places in nature. For example:
- Cut an apple crosswise: How many chambers are there with seeds?
- Does a banana break into sections lengthwise? How many?

Where else in nature can you find the Fibonacci sequence?