Finding Fibonacci

FIFTH GRADE

The Fibonacci Sequence is a pattern of numbers that are often found in nature. The sequence is created by starting with 1 and adding the previous number together, for example, 0+1=**1**, 1+1=**2**, 1+2=**3**, 2+3=**5**, 3+5=**8** and so on. Chances are students will be able to identify Fibonacci numbers in your school garden as they can be found in the number of petals on a flower, points on a leaf, number of spirals in a sunflower or pinecone, spiral pattern of growth in a succulent or leaves growing on a stem.

SUBJECT

SOCIAL SCIENCE/MATH

TIME

30 - 45 MIN

MATERIALS

A few pinecones or sunflowers to use as props

Blank lined paper, 1 sheet per student

Pencils, 1 per student

Clipboards, 1 per student

DIRECTIONS

- Start this activity in the classroom and show the two-minute trailer for the book Blockhead by Joseph D'Agnese (https://youtu.be/XItCNf5Bjew) for a quick introduction to Fibonacci. Write the numbers 1, 1, 2, 3, 5, 8, 13, 21, 34, and ask students to try to find the pattern.
- Begin to reveal the pattern if students do not figure it out. The pattern is created by starting with 1 and adding the previous number together. Write the pattern on the board 0+1=1, 1+1=2, 1+2=3, 2+3=5, 3+5=8. Ask what comes next? Continue to write more of the sequence asking them to add the numbers as you display them on the board.
- The sequence was discovered as early as 200 BC in India by an ancient scholar named Pingala, but it was made famous centuries later by Leonardo of Pisa, known as Fibonacci.
- Explain that the Fibonacci sequence is found in nature, and use the pine cone or a sunflower as an example. Count the number of spirals at the top of the pine cone. Is it a Fibonacci number? Chances are it is (although there can be anomalies from time to time). Pass a few pine cones around so students can count the number of spirals themselves.
- Task students to explore the garden looking for Fibonacci numbers.
  - Look for spirals, such as inside the head of a sunflower – how many spirals did you count?
  - Count the number of petals on flowers, the number of tips on leaves, the number of leaves on a stem, etc. – are they Fibonacci numbers?
  - Look at plants from a birds eye view to identify how the leaves are arranged in a spiral and do not overlap. This is Fibonacci too!
- Record observations on the blank paper and include a description of what they found, how it is related to the Fibonacci sequence (is it a spiral, or number?), and draw a picture of the item.
- Extension: If students want to know more about the Fibonacci sequence after this activity, consider showing this 5-minute video: Doodling in Math: Spirals, Fibonacci, and Being a Plant (https://youtu.be/ahXIMUkSXX0), getting the book Blockhead: The Life of Fibonacci by Joseph D'Agnese, or play the full read aloud from YouTube (https://youtu.be/sc1CjKc1NGc).

SOURCE

Adapted from:

- Schoolyard | Fibonacci Sequence 101