



Classroom Activity

10 Big Question: How will we conserve species diversity?

The mathematics of nature

The spiral form of the nautilus shell is logarithmic, meaning its radius grows exponentially with the angle. It's also known as the Fibonacci spiral because of its relationship to the Fibonacci numbers. There are many examples of such spirals in nature. In this activity you will explore the mathematics of a logarithmic spiral and look at where nature has found it useful.

Start by watching this series of videos about the Fibonacci numbers in nature from Vi Hart. There's three parts:

- > <http://youtu.be/ahXIMUkSXX0>
- > http://youtu.be/IOIP_Z_-0Hs
- > <http://youtu.be/14-NdQwKz9w>

Now it's your turn for some research and hands-on fun. Using the internet and/or other reference sources available to you, see if you can answer the following questions and attempt the hands-on exercises:

- > What are the Fibonacci numbers?
- > Who was Fibonacci?
- > What is the golden ratio?
- > Is the nautilus shell a Fibonacci spiral?
- > Make a list of other examples found in nature.
- > Draw a Fibonacci spiral.
- > Collect some natural samples and see if they follow the Fibonacci pattern or some other pattern.
- > Attempt to make an origami nautilus shell following the tutorial here:
[+] <http://xinjingrushui.com/node/83>