Golden Rectangle

The Fibonacci sequence is also related to a very common and visually pleasing rectangle called the “golden rectangle.” The sides of the golden rectangle have the following proportions:

$$L/S = (L+S)/L = 1.618$$

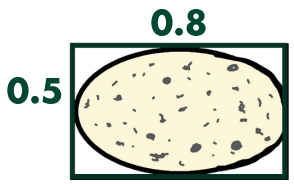
L = long side S = short side

This is approximately the same ratio as two consecutive Fibonacci numbers:

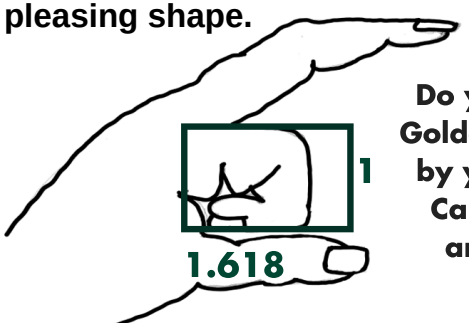
As the pair of Fibonacci Numbers get higher the closer the approximation to the Golden ratio.

3/2 = 1.5 2 3 1.5
5/3 = 1.66...
8/5 = 1.6 5
... ...
377/233 = 1.61802...
... ...

Cliff swallow eggs have the proportion of the golden rectangle



The golden rectangle is found in nature and widely used in art, architecture, and many common objects due to this pleasing shape.



Do you see the Golden rectangle by your hand? Can you find any more?

Nature's Numbers

At Home Nature Observation Project

Can you find any Fibonacci's Numbers in your natural surroundings? Take out a piece of paper and record, sketch, or count the number of examples you can find.

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Nature's Numbers

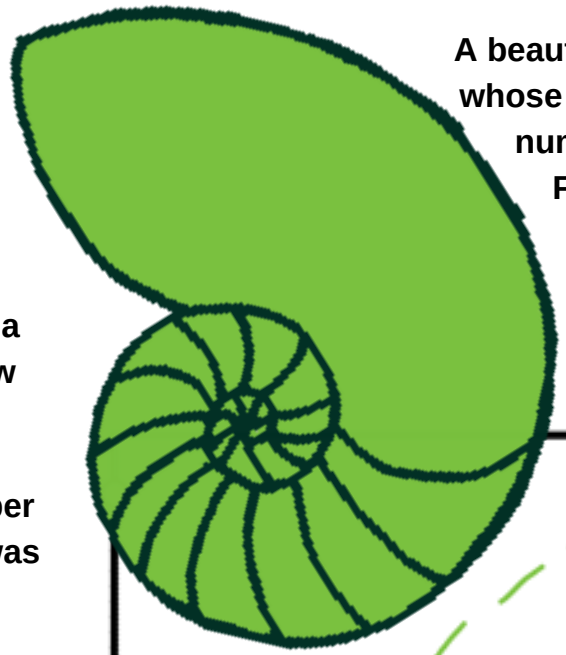
Leonardo of Pisa, who wrote under the pen name Fibonacci, was a thirteenth century mathematician. He developed a sequence of numbers while solving a hypothetical problem that asked how fast a pair of rabbits might breed.

His sequence began with the number one and each number that followed was equal to the sum of the previous numbers.

1 1 2 3 5 8 13 21

(1), (1+0), (1+1), (2+1), (3+2), (5+3), (8+5), (13+8)

Although Fibonacci's Sequence was first derived for a hypothetical problem, the sequence appears in the natural world. For example, the spiral shape of a fern's new leaf, the branching pattern of many plants, and the number of petals in a variety of flowers.



A beautiful spiral can be drawn by using squares whose dimensions are successive Fibonacci numbers as building blocks (see below). The Fibonacci spiral is nearly identical to the spiral found in many natural objects such as ammonites, ram horns, ocean waves, and the galaxy. Also note that you created the "golden rectangle".

1 + 1 = 2 + 1 = 3 + 2 = 5 + 3 = 8 + 5 = 13 + 8 = 21 + 13 = 34 + 21 = 55