Fibonacci Numbers

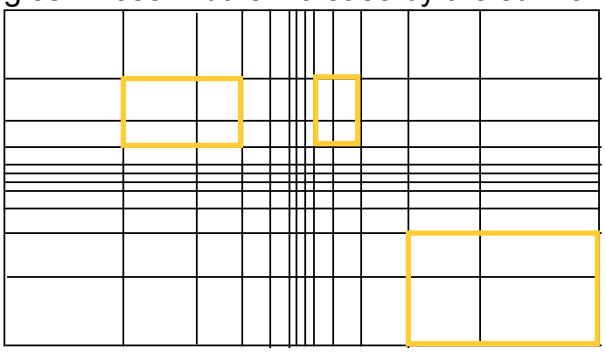
In the 13th century, an Italian mathematician named Leonardo Da Pisa (also known as Fibonacci = son of Bonacci) described an interesting pattern of numbers.

The sequence was this; 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, ...

Notice that given the first two numbers, the remaining sequence is the sum of the two previous elements. This pattern has been found to be in growth structures, plant branchings, musical chords, and many other surprising realms. As the Fibonacci sequence progresses, the ratio of one number to its following number is about 1:1.6. Actually, the further along the sequence that one continues, this ratio approaches 1:1.618033988749895. This is a very interesting number called by the Greek letter phi, φ. Early Greek artists and philosophers judged that a desirable proportion in Greek buildings should be width = φ times height. The Parthenon is one example of buildings that exhibit this proportion.

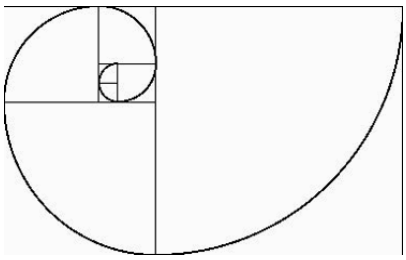
All of our coloring graphics exhibit the φ proportion.

The **lattice** is made of rectangles whose widths increase by the sum of the two previous widths.

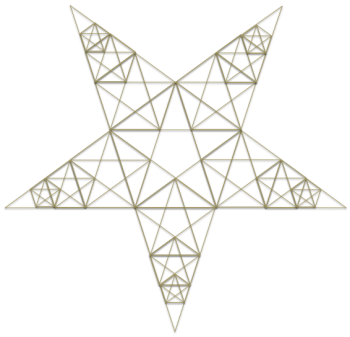
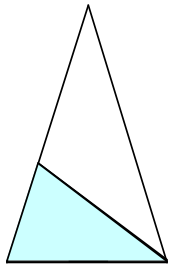
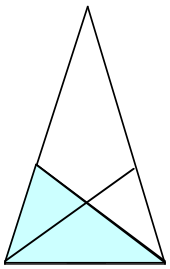
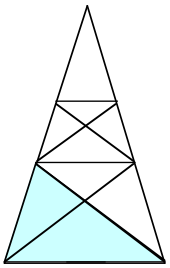
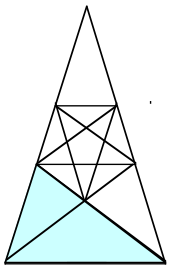


The **Spiral:** The Fibonacci sequence can be viewed as a spiral by drawing successive Fibonacci-sized squares. Start with a 1 x 1 square in the center of your paper. Beside that square place another 1 x 1 square. Since 1 + 1 = 2, the next square will be a 2 x 2. 1 + 2 is 3. So, the next square is 3 x 3, and so on. Each succeeding square is placed in a counter-clockwise position to the last square as they rotate around the initial 1x1 square.

The spiral is made of quarter circles embedded in squares whose sides increase by the sum of the two previous square sides.



Our **Pentagram** drawing is filled with Golden triangles and measures of phi. Any diagonal of a pentagon is phi times larger than the side of the pentagon. The length of one star point of a pentagram is phi times the interior pentagon's side or the base of the Golden Triangle that is the star's point.

Other fabulous φ facts;

φ is about 1.618033988749895

$\frac{1}{\varphi}$ is about .618033988749895

Do you notice anything cool with the two values above?

$\varphi - 1 = \frac{1}{\varphi}$

Since $\varphi = \frac{1}{\varphi} + 1$ then $\varphi = 1 + \frac{1}{\varphi} = 1 + \frac{1}{1+\frac{1}{\varphi}} = 1 + \frac{1}{1+\frac{1}{\frac{1}{\varphi}}}$ $etcetera$