Title of Book: **Blockhead: The Life of Fibonacci**
Author: **Joseph D'Agnese**
Publisher: **Henry Holt and Company/ 2010**
ISBN: **978-0-8050-6305-9**

Grade Levels for Recommended Use: Third Grade – Eighth grade

(3.7) Patterns, relationships, and algebraic thinking. The student uses lists, tables, and charts to express patterns and relationships. The student is expected to:
(B) identify and describe patterns in a table of related number pairs based on a meaningful problem and extend the table.

Brief Summary: Set in the Middle Ages, Leonardo growing up in Italy is called "blockhead" for daydreaming about number patterns. This "biography" explains how Leonardo Fibonacci discovered that most things in nature follow a set pattern, now called the Fibonacci sequence. The book has visual references to Fibonacci's work, such as swirling features suggestive of the spiral, a key element in the mathematician's theories of nature. O'Brien's illustrations place Fibonacci in his native Pisa using Hindu-Arabic numerals (which he promoted vigorously and rightly ascribes to India), as well as presenting a visual solution to his most famous mathematical word problem with rabbits.

Materials needed:

Art Paper or legal size paper, rulers, and pencils

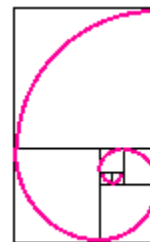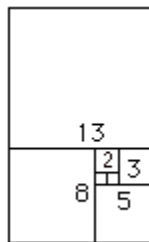**Suggested Activity***: Fibonacci Rectangles and Shell Spirals*

Before reading the book, show a trailer for the book:
http://www.amazon.com/Blockhead-Life-Fibonacci-Joseph-DAgnese/dp/0805063056

Math + Nature = Fibonacci

Use the website to show the animated version:
http://www.maths.surrey.ac.uk/hosted-sites/R.Knott/Fibonacci/fibnat.html

1. Make a picture showing the Fibonacci numbers 1,1,2,3,5,8,13,21,..
2. Turn paper lengthwise. Measure a square on the bottom right of 5 by 5.
3. Start with two small squares of size 1 next to each other on the top left of the 5 by 5 square.
4. On top of both of these draw a square of size 2 (=1+1).
5. Now draw a new square - touching both a unit square and the latest square of side 2 - so having sides 3 units long; and then another touching both the 2-square and the 3-square (which has sides of 5 units).
6. Continue adding squares around the picture, **each new square having a side which is as long as the sum of the latest two square's sides**. This set of rectangles whose sides are two successive Fibonacci numbers in length and which are composed of squares with sides which are Fibonacci numbers, we will call the **Fibonacci Rectangles**.
7. Starting with the "right" 1 by 1 square, draw a spiral in the squares, a quarter of a circle in each square. The spiral is not a *true* mathematical spiral (since it is made up of fragments which are parts of circles and does not go on getting smaller and smaller) but it is a good approximation to a kind of spiral that does appear often in nature. Such spirals are seen in the shape of shells of snails and sea shells.

Adapted by Dr. Faye Bruun, 2010