Geometric Fallacy and The Golden Series

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Topic: A look at a Geometric Fallacy and how it relates to the Fibonacci numbers, the Golden Ratio and the Golden Series.

Connection to Core Curriculum: CCSS.Math.Content.HSG.CO.B.6 Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.

Overview: This activity will give students an opportunity to explore properties of the Fibonacci numbers and the Golden Ratio. It is also designed to show how special and unique the Golden Ratio is.

Objectives: Participants will explain why the area of the rectangle in the first example is different from that of the square. They will then gain appreciation for the Golden Ratio and the Golden Series.

Materials Needed: Students will need a computer.

Technology: The applet "Geometric Fallacy and the Golden Series".

Role of Technology: The technology makes it possible to visualize and understand where the fallacy is in the square vs. rectangle area.

Web Reference: http://tube.geogebra.org/student/mOCs96NP8

Activity Plan: The Students will be given the link to the applet and can then complete the task and explore the areas of the squares and rectangles and determine why the fallacy exists in the first set. They can then examine the second set and learn about the Golden Ratio and the Golden Series.

Extensions: Students may want to further pursue study of the Golden Series which is both geometric and arithmetic.

Included documents: Discussion prompts.

References:

1. Livio, M. (2008). The golden ratio: The story of phi, the world's most astonishing number. Random House LLC.
2.Huntley, H. E. The Divine Proportion: A Study in Mathematical Beauty,. New York: Dover Publications, 1970. Print.