Golden Ratio in Art

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**Description of Activity**

The golden ratio is a mathematical ratio found in nature that is used in designs and artwork. The reason we use the golden ratio in the visual arts is to create a more aesthetically pleasing composition. Once students understand the golden ratio and its importance they can begin utilizing the golden ratio in their own work- specifically when designing their guitar body. In this lesson students will be learning about the golden ratio through a variety of activities. They will analyze artwork, watch a lecture/prezi, analyze found images and objects, and watch a video, all on the golden ratio. By the time they are done with this lesson they should have a firm grasp of the concept. This activity is designed for introductory level high school students, but would be appropriate for middle school as well. It will likely take two blocks to complete, one day for learning, one day for review and quiz.

**Learning Objectives:**

1. Students will be able to describe the purpose of the golden ratio in visual arts.
2. Students will be able to differentiate between a work of art using the golden ratio and one without.
3. Students will be able to list several artists/art works that utilize the golden ratio.
4. Students will be able to describe the golden ratio in mathematical terms.

**Standards:**

National Standards for the Visual Arts

* Anchor Standard #7. Perceive and analyze artistic work.
* Anchor Standard #9. Apply criteria to evaluate artistic work.
* Anchor Standard #11. Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding.

**Materials Required:**

* Projector, magazine ads or paintings, plexiglass, expo pen, ruler,

**Safety:**

**safetys:**

* N/A

**References:**

* Prezi for activity part 1 <https://prezi.com/nnztvurrldgc/the-mysterious-golden-ratio/>
* Video for activity part 4 <https://www.youtube.com/watch?v=fwYfuJfIgaw>
* Other helpful websites: <https://designschool.canva.com/blog/what-is-the-golden-ratio/>
  + - <http://www.companyfolders.com/blog/golden-ratio-design-examples>
    - <https://www.guitar-muse.com/the-guitar-meets-the-golden-ratio-5624>

**Activity:**

Part 1

Share prezi from resources with students. Use the prezi to help explain the golden ratio in detail and why it is important in art. Have students take notes, discussion to follow.

Part 2

Working in teams, students will map out the golden rectangle/golden spiral on a piece of plexi glass. They will place the plexi glass over a variety of magazine ads and paintings to see if they utilized the golden ratio. It is best to resize the images to all be the same size and have everyone in the class map out the same size rectangle.

Part 4

Explain the math behind the concept share symbols and how Phi is used. Share Fibonacci’s sequence. Show the Donald Duck you tube video from resources above.

Part 4

Have students find artwork online that uses the golden ratio and print images out. Draw the golden rectangle/spiral over artwork.

Part 5

Have students create small sketches that use the golden ratio

Part 6

Review information on the golden ratio by playing vocabulary bingo I use a 4x4 template for 16 spaces for fewer vocabulary terms. Terms for bingo can include: Phi, Golden ration, Golden spiral, 1.618, Leonardo da Vinci, Fibonacci, Divine proportion, Phidias, φ, irrational number, golden mean, a/b = (a+b)/a, etc… bring candy for prizes!

Part 7

After reviewing terminology around the golden ratio and discussing misconceptions administer the quiz.

**Quiz:**

**GOLDEN RATIO QUIZ**

Name: Date: Block:

The golden ratio is: 2.51.618

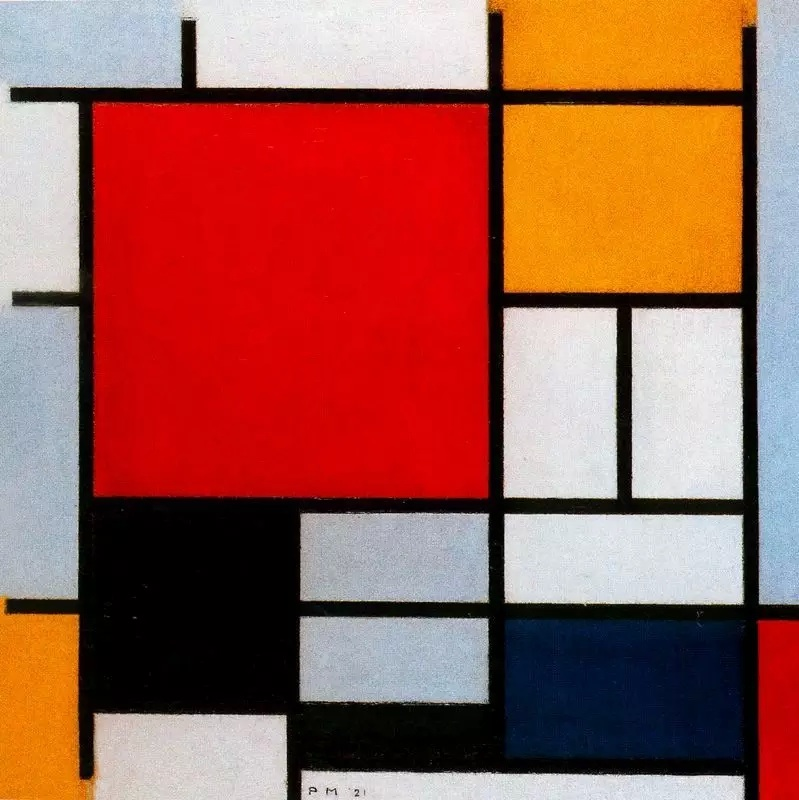
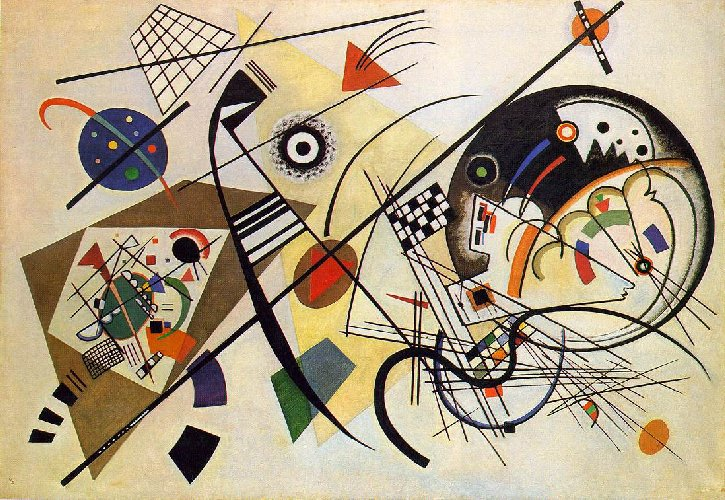
0.618 3.14

The golden ratio is also known as circle all that apply:

The golden section  
A golden integer

The golden fractal The divine proportion

The following paintings use the golden ratio

Phi, the symbol for the golden ratio, is named after which Greek sculptor?

Phineas   
Philomenos Phidias Philo

Which artist is best known for their study of the golden ratio?

Leonardo da Vinci Georgia O’keefe Jackson Pollock Pablo Picasso

Besides math the golden ratio appears in theology, art, architecture and other fields.

TrueFalse

Which of the following formulas represents the golden ratio?

a^{2}+b^{2}=c^{2}

a/b = (a+b)/ac= π\*d = 2\*π\*r

The golden ratio appears in nature.

True  
False

Which of the following is the symbol for Phi

π ρ φ Ω

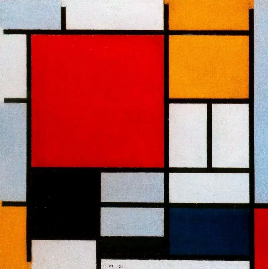
What type of number is Phi (the value of the golden ratio) 1.618

A rational numberA prime numberA whole numberAn irrational number

**GOLDEN RATIO QUIZ ANSWER KEY**

The golden ratio is: 1.618

The golden ratio is also known as circle all that apply: The golden section /The divine proportion

The following paintings use the golden ratio   

Phi, the symbol for the golden ratio, is named after which Greek sculptor? Phidias

Which artist is best known for their study of the golden ratio? Leonardo da Vinci

Besides math the golden ratio appears in theology, art, architecture and other fields. True

Which of the following formulas represents the golden ratio? a/b = (a+b)/a

The golden ratio appears in nature. True

Which of the following is the symbol for Phi φ

What type of number is Phi (the value of the golden ratio) 1.618 An irrational number

**Reviewing Faculty Cohort Members:**

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