

The History & Golden Ratio of the Great Pyramid

Φ π

Study Guide

Natureglo's eScience Copyright 2015

Revised 12/31/16

Permission is granted to reproduce this activity guide per one family household and per teacher classroom and for the purchaser's personal use only.

Cover image: The title background cover, a painting by David Roberts and in the public domain. Sand background (this slide too) in the public domain from Pixabay. The Great Pyramid photographed by Nina Aldin Thune, The Great Sphinx's head a derivative work from Wellcome Library, London. The Phi and Pi symbols from OpenClipart and in the public domain. The sidebar Egyptian hieroglyphics pillars from the book, *Description of Egypt* from the 17th century and in the public domain.

Connect with Natureglo's eScience today!

Like Natureglo's eScience on Facebook at:

<https://www.facebook.com/natureglo1>

Visit & Follow Natureglo's Blog at:

<http://naturegloscience.blogspot.com/>

Follow Natureglo's eScience on Twitter at:

<https://twitter.com/natureglo1>

Visit & follow Natureglo's eScience Educents store at:

<http://www.educents.com/natureglos-esience>

You can connect with Natureglo's eScience on Google at

gab21921@gmail.com

Table of Contents

**The Great Pyramid of Giza,
Monument of Mysteries.....pg.4**

**PowerPoint Interaction Questions –
The Golden Ratio & the Great Pyramid.....pgs. 5 – 7**

Journal Entry.....pg. 8

**The Golden Ratio & Great Pyramid Web Resources
And Project & Activity Ideas.....pg. 9**

NatureGlo’s eScience Student Project Rubric.....pg. 10

**PowerPoint Interaction Questions –
The Golden Ratio & the Great Pyramid Quiz.....pgs. 11 – 13**

**PowerPoint Interaction Questions & Quiz – The Golden Ratio &
the Great Pyramid Answer Key.....pgs. 14 - 16**

The Great Pyramid of Giza, Monument of Mysteries

Few of the worlds wonders hold more fascination than the Great Pyramid of Giza, one of the Seven Wonders of the Ancient World yet mostly intact. This pyramid is shrouded in mysteries, which today's world is in a fevered frenzy trying to unravel. There is a continued debate among archaeologists, Egyptologists, and mathematicians regarding whether there is enough proof that the golden ratio (mathematical equivalent for balance and beauty) and the Pythagorean theorem are related to the Great Pyramid. However, today, deeper research is unearthing facts that reveal a culture far more advanced than we may understand today. There are many reputable scholars that believe there is plenty of strong evidence that the Egyptians did have knowledge of these numbers originally thought to be found long after their time. This study will address the latest research on the topic.

The Rhind Mathematical Papyrus, an Egyptian mathematics textbook, is the best real example we have on record of their mathematics. The papyrus is 18 feet by 13 inches. The text reveals an Egyptian knowledge of a 3-4-5 12-knotted rope triangle which seems to relate to Pythagoras' theorem though the golden mean does not seem to be recorded anywhere in the current writings we have. But the Egyptian Royal Cubit measurement seems to justify the Golden mean arguably found in the Great Pyramid. Much of the Egyptian writings were destroyed through wars and looting. There is speculation that the Golden Mean or Phi may have been a secret passed down through the ages and used by the Egyptians in building the Great Pyramid. Come on a Golden journey, collect the facts and see what you think of this mysterious Great Pyramid and it's relationship to the Golden Number!

PowerPoint Interaction Questions - The Golden Ratio & the Great Pyramid

Directions – Read through NatureGlo’s eScience PowerPoint, The Golden Ratio & the Great Pyramid. Answer the questions below.

Slide #3 The Great Pyramid of Egypt – What is unique about the Great Pyramid of Giza as one of the Seven Wonders of the ancient world?

1. _____

Slide #3 – The Great Pyramid is believed to have been built for what purpose?

2. _____

Slide #3 – The Great Pyramid was built when?

3. _____

Slide #5 Numbers of Materials & Stone Cutting – List the two types of stones used in building the great Pyramid below.

4. _____
5. _____

PowerPoint Interaction Questions – The Golden Ratio & the Great Pyramid

**Slide #6 The Great Pyramid's Building Materials: Block Transportation –
What unit of measurement did the Egyptians use for the Great Pyramid?**

6. _____

**Slide #11 – Evidence shows that three important types of geometry
(more too) were used by the Egyptians in the building of the Great
Pyramid. List the three from slide # 11 below.**

7. _____

8. _____

9. _____

PowerPoint Interaction Questions – The Golden Ratio and the Great Pyramid

Slide #17 The Great Pyramid & the Golden Ratio

10. Using the _____ (a²+b²=c²), the Great pyramid's golden triangle represents one of the golden ratio's unique properties or $1 + \text{Phi} = \text{Phi}^2$.
- a. Pythagorean theorem b. Golden number c. Divine proportion

The Golden Ratio & The Great Pyramid Journal Entry

Name: _____ Date: _____

Directions: Fill in the information below. You can use the Golden Ratio & the Great Pyramid resource page to assist you here: <http://hascmathart.weebly.com/the-great-pyramid.html>

Sketch

1). General Description

2). Size

3). Color

4). Patterns

5). Related numbers and geometric shapes

The Golden Ratio & Great Pyramid Web Resources

Learn more by visiting Natureglo's eScience MathArt Virtual library at the link below.

<http://hascmathart.weebly.com/the-great-pyramid.html>

Project and Activity Ideas

Students can do a research project using the resources from the headings, **Web Resources, Projects and Activities, Live & HYBRID course Videos and Informative Videos** listed on the resource page. A scoring rubric is on the following page for parents who choose to grade any student research project(s) work.

Natureglo's eScience Student Project Rubric:

Usage: PowerPoints, posters & other written research projects

Category	Criteria				Points
	4 Exemplary	3 Accomplished	2 Developing	1 Beginner	
Accurate Research/ Information Gathering & Citation	All taken from several sources & cited in work	Most taken from sources & cited	Some taken from sources and cited	Little or none taken from sources and or not cited	
Content	Great number of interesting facts around topic	Many interesting or too many facts	Some important facts	Few or no facts	
Graphics/ Sound/ Animation	High quality; enhance understanding on every page. All borrowed graphics with source cited.	Many enhance understanding on most pages; most borrowed graphics cited.	Some enhance understanding; some cited	Zero, unrelated, very few or poor quality graphics and/or none cited	
Organization & Attractiveness	Well organized and very attractive; demonstrates creative & logical sequencing and sentence structure	Mostly well organized and attractive; demonstrates logical sequencing and sentence structure	Somewhat organized and attractive, but some illogical sequencing and sentence structure	Unattractive and or weakly organized or disorganized	
Grammar and Mechanics	All correct	1 – 5 errors	5 – 10 errors	Frequent errors	
Divide total points from 20 for grade.			Total Points/Grade:		

PowerPoint Interaction Questions - The Golden Ratio & the Great Pyramid Quiz

Directions – Read through NatureGlo’s eScience PowerPoint, The Golden Ratio & the Great Pyramid. Answer the questions below.

Slide #3 The Great Pyramid of Egypt – What is unique about the Great Pyramid of Giza as one of the Seven Wonders of the Ancient World?

1. _____

Slide #3 – The Great Pyramid is believed to have been built for what purpose?

2. _____

Slide #3 – The Great Pyramid was built when?

3. _____

Slide #5 Numbers of Materials & Stone Cutting – List the two types of stones used in building the great Pyramid below.

4. _____

5. _____

PowerPoint Interaction Questions – The Golden Ratio & the Great Pyramid Quiz

**Slide #6 The Great Pyramid's Building Materials: Block Transportation
– What unit of measurement did the Egyptians use for the Great
Pyramid?**

6. _____

**Slide #11 – Evidence shows that three important types of geometry
(more too) were used by the Egyptians in the building of the Great
Pyramid. List the three from slide # 11 below.**

7. _____

8. _____

9. _____

PowerPoint Interaction Questions – The Golden Ratio and the Great Pyramid

Slide #17 The Great Pyramid & the Golden Ratio

10. Using the _____ (a²+b²=c²), the Great pyramid's golden triangle represents one of the golden ratio's unique properties or $1 + \text{Phi} = \text{Phi}^2$.
- a. Pythagorean theorem b. Golden number c. Divine proportion

PowerPoint Interaction Questions & Quiz -
The Golden Ratio & the Great Pyramid
Answer Key

Directions – Read through NatureGlo’s eScience PowerPoint, The Golden Ratio & the Great Pyramid. Answer the questions below.

Slide #3 The Great Pyramid of Egypt – What is unique about the Great Pyramid of Giza as one of the Seven Wonders of the Ancient World?

1. only one left mostly intact

Slide #3 – The Great Pyramid is believed to have been built for what purpose?

2. Pharaoh Khufu’s tomb

Slide #3 – The Great Pyramid was built when?

3. 2580–2560 BC

Slide #5 Numbers of Materials & Stone Cutting – List the two types of stones used in building the great Pyramid below.

4. Granite

5. limestone

PowerPoint Interaction Questions & Quiz – Answer Key

Slide #6 The Great Pyramid's Building Materials: Block Transportation – What unit of measurement did the Egyptians use for the Great pyramid?

6. Royal cubit

Slide #11 – Evidence shows that three important types of geometry (more too) were used by the Egyptians in the building of the Great Pyramid. List the three from slide # 11 below.

7. Phi, or Golden Ratio

8. Pi

9. Pythagorean Theorem

PowerPoint Interaction Questions – The Golden Ratio and the Great Pyramid

Slide #17 The Great Pyramid & the Golden Ratio

10. Using the **a. Pythagorean theorem** ($a^2+b^2=c^2$), the Great pyramid's golden triangle represents one of the golden ratio's unique properties or $1 + \text{Phi} = \text{Phi}^2$.
- a. Pythagorean theorem b. Golden number c. Divine proportion