

HONORS GEOMETRY



UNIT PROJECT 2
2017 - 2018

PROJECT - UNIT #2

The Golden Ratio- Found in Living Things

The Golden Rectangle shows the Golden Ratio in its ratio of width to length. The approximate value of this irrational number is 0.618:1. This ratio is found throughout nature. The way branches are arranged on a stem, the curve of an elephant's tusk, and the nodules on the spirals of pineapple are some examples of how the Golden Ratio is present in all life.

The human body also demonstrates the Golden Ratio in several ways. For this project, use an adult subject to make the measurements described below. Once the measurements have been made, find the ratio of M_1 to M_2 . Display each measurement on poster board or in a PowerPoint and display the resulting ratio.

M1	M2
1. Top of head to mid neck	Mid neck to navel
2. Top of head to navel	Navel to floor
3. Knee to floor	Knee to navel
4. Bottom of nose to mid-mouth	Bottom of nose to mid-eyes
5. Mid-eyes to bottom of nose	Bottom of nose to bottom of chin
6. End joint of any finger	Middle joint of the same finger
7. Middle joint of any finger	Base joint of the same finger

How close to the Golden Ratio did you come? The ratios of persons not fully grown will not be as close to the Golden Ratio as the ratios of grown persons. Once growing has stopped, the majority of people show ratios very close to the Golden Ratio for all of the above data.

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ESSAY PROJECT

For this project you will be doing some research about a mathematician chosen from the list below. In order to share your findings with the entire class, you will produce a full-sized poster board or a PowerPoint which highlights the mathematician's life and accomplishments. The poster or PowerPoint shall contain the mathematician's name with dates of birth and death prominently displayed. Include a portrait or photocopy of what the mathematician looked like. Items to be included are achievements in mathematics with a brief explanation of what the mathematician accomplished, such as the Pythagorean Theorem, complete with a diagram and/or formula. Accomplishments outside the field of mathematics such as Einstein's winning the Nobel Prize, should also be used. List at least two references you used for your research, visible on the poster board or-PowerPoint.

Be sure your poster or PowerPoint is easily read and eye-appealing.

The following is a list of mathematicians for the mathematics history project.

1. THALES
2. PYTHAGORAS
3. JOHN NAPIER
4. JOHANN KEPLER
5. LEONHARD EULER
6. ALBERT EINSTEIN
7. RENE DESCARTES
8. BLAISE PASCAL
9. ERATOSTHENES
10. GALILEO GALILEI
11. EMILIE DU CHATELET
12. APPOLONIUS OF PERGA
13. CHARLES BABBAGE
14. GRACE MURRAY HOPPER
15. EUCLID
16. BHASKARA
17. HYPATIA
18. SOPHIE GERMAIN
19. ADA LOVELACE
20. JANOS BOLYAI
21. NICCOLO TARTAGLIA
22. PIERRE DE FERMAT
23. GEORGE BOOLE
24. C.F. GAUSS
25. EVARISTE GALOIS
26. EVANGELISTA TORRICELLI
27. N.I. LOBACHEVSKI
28. ARCHIMEDES
29. G.W. LEIBNITZ
30. OMAR KAYYAM
31. MARY FAIRFAX SOMERVILLE
32. ISAAC NEWTON
33. LEWIS CARROLL
34. FIBONACCI
35. SONYA KOVALEVSKY
36. EMMY NOETHER
37. AL-KHWARIZMI
38. WITCH OF AGNES!
39. GOROLAMO CARDANO
40. SRINIVASA RAMANUJAN
41. FRANCOIS VIETE
42. HERON

The following set of books may serve as resources for any of the mathematicians listed.

Bell, T.E. (1937). *Men in Mathematics*.

Boyer, C. (1968). *The History of Mathematics*.

Burton, D. (1985). *The History of Mathematics: An Introduction*.

Cajori, F. (1928). *A History of Mathematics Notation*.

Dunham, W. (1990). *Journey Through Genius - The Great Theorems of Mathematics*.

Eves, H. (1983). *An Introduction to the History of Mathematics*.

Eves, H. (1969). *In Mathematical Circles*.

Hollingsdale, S. (1989). *Makers of Mathematics*.

Johnson, Art. (1994). *Classic Math: History Topics for the Classroom*.

National Council of Teachers of Mathematics. (1969). *History Topics for the Mathematics Classroom*.

Osen, Lynn M. (1974). *Women in Mathematics*.

Information on mathematicians can be found on the internet. Use a search engine to find information on your choice.