

PreCalculus Final Project 2004: Mathematics in Nature

Is mathematics discovered or invented?

Choose a topic about how mathematics is evident in nature. Describe the mathematics that your topic illustrates. Why does your topic follow this pattern? Does anything else? Everyone must pick a different topic and sign up. First one signed up wins!

Potential Topics

Crystals and 3D geometry

Kaleidoscope patterns and diatoms

Honeybees

Starfish

Nautilus shells, pinecones, sunflowers and the Fibonacci series

The golden mean

Snowflakes, fractals

Sources

What Shape is a Snowflake? Magical Numbers in Nature, Ian Stewart, 2001. (Clemens and VandeWater have copies.)

The Parsimonious Universe, Shape and Form in the Natural World, Hildebrandt and Tromba, 1996. (SLU Science Library)

Math Forum, the best starting point for any mathematical searches www.mathforum.org

Gallery of Mathematics in Nature and Art http://www.whitakercenter.org/science/math_art.asp

Fractals and Snowflakes http://compute2.shodor.org/snowflake/help_docs/self_sim_lesson.html

Order and Chaos in Mathematics and Nature video

<http://www.video.warwick.ac.uk/chaos/frame1.asp>

Your task

Present an oral presentation to the class (5 – 10 minutes.) Make sure you use a visual aid, for example, a poster or a Power Point presentation. Power Point presentations or web sites are preferred because everyone can see them. [Power Point tip: use dark letters on light background – it shows up better on the computer projector.] Be sure to use the rubric as a checklist to prepare your presentation.

Hand in a 1 – 2 page summary paper that includes a bibliography.

Precalculus Final Project 2004

Name _____

Score _____

Topic

Summary of Presentation

Criteria	
Topic chosen is about a connection between mathematics and nature	
Quality visual aid(s): shows time, effort and creativity	
Vocabulary use: correct terminology (new vocab is a plus)	
Complexity: you should demonstrate that you learned something new about mathematics (MS math is a minus, HS math is a check, something we've never done in HS is a plus)	
Mathematics: you need to explain/discuss/describe the mathematics that is involved in your topic. Why does your topic follow this pattern? Does anything else?	
Expertise: learn enough about your topic to answer questions from an ignorant audience (your class and me)	
Class Presentation: organized, clear, interesting voice and manner	
Originality: everyone must choose a different topic or a different aspect of a topic	
Paper: neat, clear summary with details as needed, watch spelling! Accurate list of sources.	
Timeliness: you will lose points if you are not prepared or absent.	