

MA110 - Mathematical Explorations - Spring 2004
Mathematics in the Arts and Mathematics in Nature Poster Assignment

What is a poster? Poster Sessions are used to publicize, announce, and/or present the results of research investigations. They are widely used in professional conferences (including virtually all conferences for mathematicians and scientists), college and university courses, and meetings of all kinds. They are useful because many posters can be displayed without the time and space limitations that traditional presentations impose. Additionally, it makes it easier for participants to browse and find research of interest.

What are our posters about? You are to create a poster which celebrates mathematics in the arts or mathematics in nature.

Purpose of the posters. Almost universally the rationale for requiring students to study mathematics is its ubiquitous application. Mathematics is widely viewed as one of the most powerful tools for humans to control, model, represent, and understand the universe. Hence, conventional wisdom goes, students should study it. However, mathematics has a beauty and a universality whose importance rivals its utility. Mathematics is an art - one of the classical liberal arts - and has always enjoyed a close connection with the arts. The purpose of our posters is to illustrate mathematics in the arts - both the human arts (e.g. sculpture, painting, literature, music) and what may be termed *natural art* (e.g. crystals, spiral growth).

Poster presentations. All posters will be hung in the 4th floor hallways of Wilson Hall. All posters are due on Monday and will be displayed at least until Friday afternoon. You must either meet with me or make arrangements so your poster is displayed appropriately prior to the beginning of Monday's class. The posters will be hung from two screws that are exactly two feet apart. All posters must include the author's name on the front.

Damage disclaimer. Because of the public nature of the display of the posters, they are vulnerable to vandalism. Students who are not willing to take the small risk that appropriate display of their posters entail must contact me well in advance about alternative arrangements.

Requirements. The due date for your poster will be announced early in the course.

- One week prior to the due date you must submit, in writing, a brief proposal which identifies the subject of your poster and gives several references that you will use in the construction of your poster.
- Prior to submitting this proposal you must check to insure that nobody else has the same subject, by looking on the lists on Prof. Fleron's door, and once the proposal is accepted you must add your subject to this same list.
- Your poster must include a list of references either on the front or the back. These references must be diverse, they cannot simply be a few obscure Internet sites. Internet sites should be reputable and you should include reference beyond the Internet.
- Normal rules regarding appropriate referencing and citation must be followed. I.e. every passage you use that you have not written must be quoted and appropriately cited.
- Your poster must be original. You cannot simply cut and paste passages from a few Internet sites and glue them to posterboard.
- You must assess the posters of at least ten other students and these assessment reports must be submitted with your final report.
- Your final self-assessment report must include a tabulation of the scores you received and must conclude with a suggested letter grade (on the standard A+ - F scale) for your poster.

Assessment criteria. Assessment, on a scale of 1 - 5, will be used to reflect how well each poster achieved each of the following:

- ∞ An interesting, accessible topic.
- ∞ An engaging description and/or illustration of the topic.
- ∞ Success in using the topic to aid in our efforts to illustrate the importance of mathematics in the arts or mathematics in nature.
- ∞ An appropriate collection of additional information interested readers can use to pursue the topic in greater depth. These may include: book, journal, audio, video, and other media and multi-media citations; Internet resources; museum holdings; maps of nature trails; event dates; etc.
- ∞ The physical construction of a high quality poster, including: appropriate design, pleasing visual layout, effectiveness, appropriate mix of media and information, effort, etc.

Assessment. Using the criteria above, your poster will be assessed by peers in your class, by Prof. Fleron, and by yourself.

Peer Assessment - Each student is required to assess the posters of at least ten other students during the course of the semester. For each poster that you assess you must completely fill out an assessment form, including written comments. One copy of this assessment form is to be submitted to the author by depositing it in the comment envelope that is attached to their poster. Duplicate copies are to be kept by the assessor until the end of the semester when they will be turned in to Prof. Fleron. Peer review will be blind - the poster author will not know the identity of the reviewers.

Self Assessment - After your poster has been removed from the presentation you are to read all of the assessment forms and comments that have been submitted. You must tabulate all of the scores submitted on all of the assessment forms. Based on this feedback and your own evaluation of your work, you are then to write a brief one- to two-page report which critiques your poster, suggests a final grade for your poster (on the standard A+ - F scale), and provides rationale for your grade determination.

Assessment by Prof. Fleron - Based on peer feedback and your report, Prof. Fleron will assign a final grade for your poster. This grade will be included on your report when it is returned to you. Peer assessment will not work unless everybody participates. Students who do not assess at least ten other posters and turn the corresponding assessment reports in to Prof. Fleron will receive a failing grade on their poster.

Resources and Suggestions for Topics. The volume of material accessible in a variety of print resources and the Internet is almost overwhelming. It should be remarkably easy to find many appropriate topics. Of particular note, April 2003 was Mathematics Awareness Month and this year's topic is Mathematics and the Arts. The official MAM site is <http://mathforum.org/mam/03/> Prof. Fleron is happy to discuss possible topics with you.

Interesting Topics. As noted, the topics are practically limitless. But if you have a hard time getting started, here are some ideas: the spiral structure of DNA, M.C. Escher's hyperbolic tessellations, the crystalline structure of snowflakes, the geometry of cubism, the mathematical mechanisms that determine animal coat patterns, origami, symmetry in quilting, the advent of perspective drawing, the mathematics of computer generated animation, mathematical structures in poetry, kaleidoscopes, the placement of guitar frets, fractals in musical compositions, the fourth dimension in modern art, the higher dimensions in the novels of Madeline L'Engle, the Pulitzer Prize-winning play Proof, suspension bridges, mosaic tiling, the literature of Lewis Carroll, etc.

Further Information on Posters. For more information on posters, the following Internet sites may be useful:

<http://writing.colostate.edu/references/speaking/poster/index.cfm>
http://www.kumc.edu/SAH/OTEd/jradel/Poster_Presentations/PstrStart.html
<http://www.math.sunysb.edu/posterproject/www/index.html>
<http://www.awm-math.org/workshops/posters.html>