

**Instructional Related Activities
Report Form**

SPONSOR	DEPARTMENT
Jerry Clifford	Applied Physics

ACTIVITY TITLE	DATE (S) OF ACTIVITY
Museum Visit - Physics of Art TK910-821-90468	Spring 2013

E-mail to the Dean's Office
30 days after activity

Description of Activity:

The Physics of Art course is designed to help increase students' appreciation and understanding of art by examining the physics of light, color, shapes and visual perception. Through classical and current artwork, students examine how artist, usually through skilled observation, learn to manipulate light and color. Art majors use this knowledge to improve their artwork; art aficionados use it to enjoy artwork.

To enhance the course, we want to expose students to original artwork in museum collections. Representations of artwork in books or on the Internet cannot convey some important aspects of artwork, such as brushstrokes and texture. Therefore, we require students to visit one (or more) of the following museums: the LA County Museum of Art (LACMA), the Getty Museum (shown below),



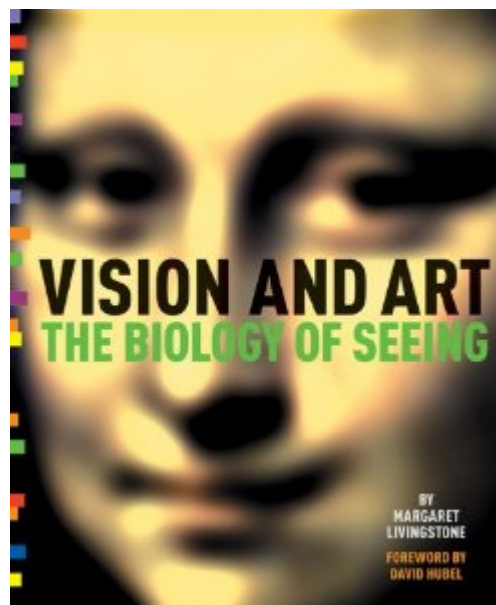
Norton Simon Museum or the Santa Barbara Museum of Art, and choose a painting to analyze based on the topics discussed in class. Students select artwork that is personally interesting due to the subject matter or the manner in which it was created.

Activity Related to Course:

A visit to a major art museum like The Getty directly supports the Physics of Art course, which is a 3-unit course taught in the Spring semester. The course covers the nature of light and optical phenomena, the interaction of light with objects, and the perception of light in different media or applications. Students examine how we “see” visual arts, from light striking the eye to images formed in our brain. Demonstrations, experiments, activities and computer simulations are used to enhance the understanding. The course includes many fun art projects where students experiment with specific art concepts and ideas.

Art reproductions in books or on the Internet are never like the original work. In our excellent text *Vision and Art: The Biology of Seeing*, Margaret Livingstone, a Harvard neurobiologist, describes the reasons that the 3D world isn’t easily represented on a 2D media. She encourages students to view original paintings – then cover one eye to remove the stereopsis visual cue from both eyes. She describes how other visual cues, like perspective, size, obscuration, and haze, dominate when stereopsis is inhibited. Also, the thickness of paint and the type of brush strokes enhance the 3D aspects of the art. Therefore, we require students to experience the impact of original art on their senses, especially for masterpieces in museums like The Getty.

The course is popular and has an enrollment capped at 24 students, limited by the computers in our classroom. The course is especially popular with art majors, who often comment on the value of the material to their understanding and application of skills in their creative process.



Learned from Activity:

After the museum visit, the students write a paper for course credit and answer a brief questionnaire about the visit. The reports are evaluated to determine the extent of understanding the students show for the physics of the artwork. In the student reports, each student writes an in-depth analysis of the chosen painting based on the ideas and information from the Physics of Art course. Topics students consider in selecting artwork and address in their report include:

- Describe the light source and how it affects shapes, color and detail in your painting.
- Describe any particular physics applications of light (reflection, illumination, refraction, interference) in your painting. Did the artist represent or use them well?
- What kinds of textures do you see? How did the artist show them?
- Describe the use of colors and their luminance values in the painting.

- How did the artist take advantage of our visual acuity?
- What types of information from the painting is determined by our What or Where visual systems?
- How did you use the three stages of visual processing to “see” particular aspects of your painting?
- Describe how luminance is used to enhance specific aspects of the painting.
- What things did the artist do to represent a 3D world on a 2D image?
- How might the artist have used optical mixing in the painting?
- Describe how the artist is utilizing space. Is perspective being conveyed? What are the depth cues?
- Is there implied movement? How is it represented?
- Explain why you selected this particular work of art.
- How valuable was the museum visit to the Physics of Art class?



Accounting:

The IRA funding approved \$360 for “Art Museum – Physics of Art”, TK910-821-90468. Only three out of 22 students requested reimbursement for the cost of the museum visit. This may be due in part to the delay the Springs Fire caused in turning in the assignment, with the receipt showing they visited the museum. At the end of the semester, students are focused on final exams and completing projects rather than getting a reimbursement for \$15.

There are two suggestions that may help students partake of future funding for their museum visit. First, possibly museum tickets and parking passes could be purchased early in the semester and given to students for their visit. We would have to work with the museums to arrange the purchases. Second, the museum assignment and paper could be due earlier in the semester. We may have to rearrange course material so that the students have sufficient background to examine the artwork critically and write a complete report.

The museum visit is an important aspect of the Physics of Art course, and I sincerely thank the IRA committee for supporting this student-centered project.