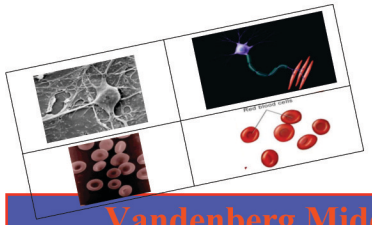

Cells: Form, Function and the Art of Models

UCSB Models and Materials: *Bridging Art and Science in the Secondary Curriculum*

Lompoc High School and Vandenberg Middle School

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Lesson Procedures

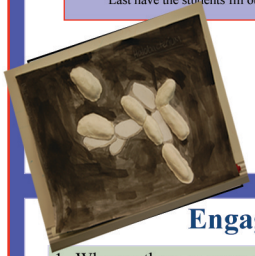
Day 1: Tap students' prior knowledge of cells. Next show PowerPoint of many different plant/animal cells, emphasizing their commonalities and varieties of cell adaptations through the lens of the elements of art: shape/form, color, texture, line, value and space

Day 2: Have students view a variety of cells under the microscope, doing observational writing and drawing based on the elements of art, using a handout.

Day 3: Handout chart of various cells (photo, drawing, properties). Students, in groups of four, pick (or are assigned) one of the eight cells on the handout. Next the students plan, and then start to work on a two dimensional tissue background for their cell models, thinking of line, shape, value, color, texture and space. They also need to choose and sign up for two or more materials for the construction of their cell model. By having the students pick materials the day before they build, teacher can be sure to provide enough materials for each period.

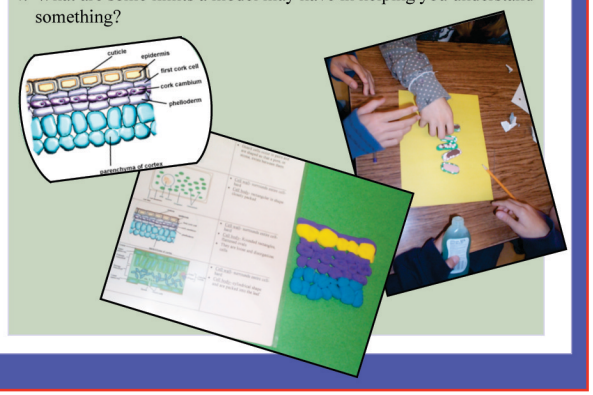
Day 4: Each student constructs their own model, one type per group, one model per student, working with their self-chosen materials.

Day 5-6: Put the similar cell models together to show tissue. Cells can be connected by Velcro to each other and to the paper. Start class presentations and finish the next day. Last have the students fill out group questionnaire.



Engage and Connect

1. Why are there so many different kinds of cells?
2. When looking at a cell, what are some visual qualities you can use to compare and contrast?
3. What is a model?
4. What are some limits a model may have in helping you understand something?



Rationale

This project was designed to help students understand that the form of a cell is related to its function; that cells work together to form tissue, and various tissues work together to form organs. Students individually will create a cell model and as a team of four will create a corresponding tissue drawing/model of various plant and animal cells/tissue.

Objectives

•To show the diversity of cells in living organisms
•To use models to demonstrate how cell form is related to its function
•To show the relationship of cells, tissues and organs
•To use the elements of art to develop observational skills

Standards

Science:

1. Cell Biology: All living organisms are composed of cells from just one to many trillions, whose details usually are visible only through a microscope.

5. Structure and Function in Living Systems: The anatomy and physiology of plants and animals illustrates the complementary nature of structure and function.

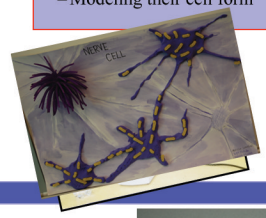
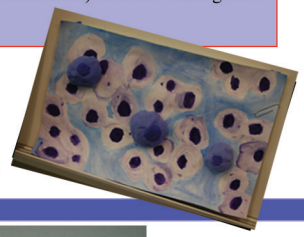
Visual Art:

1. 0 Artistic Perception: Processing, analyzing and responding to sensory information through the language and skills unique to the visual arts. Students perceive and respond to works of art, objects in nature, events, and the environment. They also use the vocabulary of the visual arts to express their observations.

2.4 Creative Expression: Review and refine observational drawing skills

5.0 Connections, Relationships, Applications: Students apply what they learn in visual art across subject areas.

Lompoc High School

Lesson Outline

- Assignment:
  - Create a mixed media bas relief based on cells and extremophiles.
- Procedure
  - Observation of a variety of cells using the elements of art: PowerPoint, microscopes, internet (www.youtube.com) and videos
  - Observational drawing with a microscope.
  - More research on the computer (internet) focusing on extremophiles.
  - Choosing materials/media to make their cells/tissue.
  - Composition and color (paint and ink) to create a background
  - Modeling their cell form