

Science and Photography - Individual ELO

This ELO allows students to explore two seemingly different areas, art and science, and merge them into one cohesive learning experience. Students will research the history of science and photography and the impact the two have had on one another, and they will create their own artwork using science.

Overview

Community Partner: Chemistry Teacher

Academic Area: art or recovery science credit; 62 hours = ½ a credit.

Essential Question: Can we use science to make art?

Competencies

- Research and Analysis - Through this ELO, students will use a variety of sources to demonstrate they understand the link between art and science. Students will think critically and strategically and apply knowledge.
- Managing information - Students will evaluate, gather, sort, and store information. They turn information into knowledge and document sources.
- Artistic Process - Students will conceive, develop, create and new artistic work, as they use the cyanotype method to produce images.
- Scientific Process - Using information from the chemistry teacher and online sources students will experiment, measure, and create the chemical process necessary for making cyanotypes.

Additional Competencies could include

- Follow instructions - as students use information found online to mix chemicals.
- Writing - as students document finds and create informational slides for their presentations.
- Reasoning and application of learning - demonstrated through the creation of the cyanotypes and the research paper.
- Public Speaking - as students share their findings during the presentation.

Student Activities

1. Research cyanotype, how to create them, and the role they played in the history of photography.
2. Additionally research 10 Photographic Contributions to Science. These can include but are not limited to: Anna Atkins and the role of photography in botany, Eadweard Muybridge freezing motion, photography and astronomy, photography and the bottom of the ocean, and/or how photography has helped us document our changing landscape.
3. Collect and manage the photographic contributions, analysing which contributions are most important and relevant and which should be included in presentation.
4. Use Google Slides, Powerpoint, or Prezi to create a presentation teaching the audience about cyanotypes and the role of photography in science throughout history.

5. Collect the necessary chemicals to make one (it is suggested that the student partner with the Chemistry teacher to determine dates/times to use the lab and to have assistance mixing chemicals safely.)
6. Mix chemicals
7. Create cyanotypes - these can be made using paper or on T-shirts. It is suggested that students experiment with a variety of surfaces and a variety of materials including plant life.
8. Photograph all cyanotypes and include them in final presentation.
9. Answer analysis and conclusion questions (see additional materials handout).
10. Write reflection: Ask students to reflect on the specific competencies and how they achieved them. This should be at least three pages long.

Assessment

Student will create a final presentation using Powerpoint, Prezi, or Google Slide Show. They will also answer the analysis and conclusion questions in the additional materials handout, after completing the cyanotype process. They will present this during a one-time after school showcase. The presentation will include the 10 photographic contributions to science, images of the cyanotype prints the student made, and a reflection. (See additional materials for assessment tools.)

More information/Additional Materials

- Images of student work
<https://drive.google.com/folderview?id=0B9YE9BMPSXLqZFpWZENaMI9DZUE&usp=sharing>
- Guide for students to make cyanotypes, also chemical process, questions etc.
<https://drive.google.com/file/d/0B9YE9BMPSXLqNW15Y2xXeE8yMHI4TVppM2NMOGhkaGc5MG04/view?usp=sharing>
- Rubric for Public Speaking:
<https://drive.google.com/file/d/0B9YE9BMPSXLqNmg2YjRvSjZxeFRzc2plV1NNYUp0NOJTX2pJ/view?usp=sharing>
- Sample science and photography research project:
https://docs.google.com/presentation/d/1U-CFaMjJKAYE8rRqBNuUhw6d_4WUiuy_IcKqgNAhSgs/edit?usp=sharing

Reflections/Comments/Suggestions

This ELO was used for a student with an IEP, as a way to explore an area he was particularly fascinated with. This student was eager and able to conduct research on the computer. However, this ELO can be modified in any way to fit the needs of another student. The most important aspects of this ELO are the creation of the art pieces using the science based chemistry and the research that links science and art. In this case, I used photography as the artform but there are many other art forms that science links to and if a student wanted to explore these they should be encouraged to do so.

At ConVal the chemistry teacher generously gave up two of her prep-periods to work with the student to mix the chemicals. Once the chemicals were made the student was able to complete the process and make the artwork on his own. It was essential that the chemistry teacher helped this student because he had an IEP and needed help completing steps. Some students may be able to complete this ELO independently while others may need more direct assistance or guidance like the student we had at ConVal. The student who did this ELO was awarded $\frac{1}{2}$ a science credit and verbalized that he enjoyed making the artwork and doing the research the most.