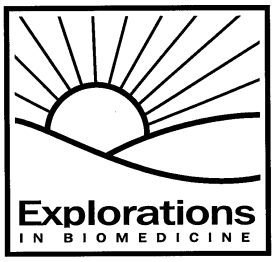

Painting With Natural Dyes

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Grade Level:

Elementary School

Painting With Natural Dyes

This activity is part of an integrated elementary unit called “Painted Tipis.” The unit is best taught in the fall in conjunction with the September celebration “American Indian Heritage Week.” It integrates lessons on literature through legends and myths, language (Blackfeet), and mathematics through structural components of the tipi.

The activity “Natural Dyes” introduces the students to the art of dyeing as used in ancestral tipi paintings. Historical cultural ties are an integral part of the Native American students learning and this unit provides those connections.

Purpose:
The purpose of this lesson is to provide elementary students with the opportunity to explore, identify and locate area plants. The inquiry cooperative learning component of this lesson will be to determine the color (dye) producing possibilities of the plant. Students will also plan and carry out an experiment to produce the dyestuff of the plant as well as create possible mordants, which is a chemical or metallic compound that will “fasten” the color to the fabric.

Objectives:
Students will be able to:

- recognize three area plants
- explore the plant’s color (dye) producing possibilities and question the results
- explore and create a method to produce a color (dye) from the plant
- investigate possible mordants used in dyeing
- create a small portion of the dye for a creative use (tipi painting)

Materials:

- heat (hot plate)
- water source (distilled)
- dye pot: stainless steel pot (2-4)
- tubs for rinsing
- long handled tongs
- strainer
- rubber gloves
- apron
- canvas piece
- dyestuff will be determined by your area’s local plants and what you choose to use (see suggestions)
- mordants (see suggestions)

Preparation and Procedure:

- This hands-on inquiry activity will take three to four 45-minute class periods to complete.
- The students will be working in cooperative learning groups of 3 to 4.

- Appropriate age level includes elementary students grades 4-5-6.
- An excellent warm up activity can be found in the American Chemical Society (ACS) newsletter. The lesson titled “Plant Rubbings” can be located at www.chemcenter.org/ichc
- The use of a KWL chart should be a good indicator on assessing student’s prior knowledge about the area’s plants. Create one with the class before the nature walk.
- Engage students by taking a nature walk around the school. Challenge them tolocate three area planks that they think will produce a color. Have them collect samples for the “dyestuff.” Examples they should be looking for are flowers, leaves, grass, roots, bark and berries that are indigenous to the area. Adaptation: If your school environment does not lend itself to nature walks or samplings of natural sources, bring in berries, roots and samplings of flowers from a nearby distributor, such as a local grocery store or florist shop.
- Classroom time is then used for student observation and exploration of the collected natural sources. Each group will identify the natural source, draw it, and write a statement of why they think that particular plant will produce color. These findings should be recorded in their science journals.
- Mordants (from the Latin word mordere, meaning to “bite” or “fasten”) can be ordered or made. Alum is a safe mordant to use, as well as vinegar. Some mordants give better results with different materials. Alum is the best for canvas.

Safety:
Safety considerations are very important to discuss before the handling of the dyestuff. Students should be cautioned about ingesting the plants, and the teacher should have the prior knowledge of the plant’s properties. Be sure that students are well aware if the plant is poisonous. Since a hot plate will be used, I advise the teacher to be strictly involved in this part of the procedure. If possible, recruit a parent or aide to help out with the heating part of the activity. Be sure and use small amounts of the plants and mordants, as well as carry out the experiment in a well-ventilated area.

Questions to Ask:
I suggest that these essential questions are posted in the classroom while the lesson is being taught.

- Which of the dyestuff (plants) collected could you use to create a color?
- What color do you think it will produce?
- Why did you think it will produce that particular color?
- What can we do to extract the color from the plant?
- What materials do you think you will need to extract a color?

Where to Go from Here:
This activity is an integrated unit that can fit well into any elementary curriculum. The concepts and ideas that are used in the integrated unit focus on the subjects of history, social studies (the study of another culture), and science where the chemical process is introduced to the students. Art and literature components fit well into this unit also. This theme is flexible enough throughout many subject areas. A good follow up activity can

be the introduction of more industrial type dyes (dyestuff not found in the area) and the effects of different mordants. These dye types can include indigo, henna and wood (see resources and references for knowledge of these particular plants.) There are many resources on the Internet. I would encourage the students to browse the web to get an idea of the popularity of natural dyes, as well as the idea of the complexity of the subject. There are many people available that know a great deal about area plants. I would invite a community member into the classroom who is knowledgeable in our area's plants.

Suggestions for Assessment:
Student assessment for the elementary level will include:

- group concept mapping
- group poster and presentation
- individual science journals (writings and drawings)
- student journals

References and Resources:
1. Castino, Kuth (1991). Spinning and Dyeing the Natural Way, Van Nostrand Reinhold Co.: New York, NY
2. Dean, Jenny (1999). Wild Color. Octopus Publishing Group Ltd: New York, NY

*Websites***:**
http://www.urbaneagle.com/ue/ue-dyebooks.html
http://www.chemcenter.org/ichc