LESSON GOALS
The purpose of this investigation is to enable students to utilize science and process skills to design and conduct an investigation into ways in which humans utilize natural resources. This activity will be useful to teachers and students alike. The teachers will have an interesting event driven activity that combines hands-on skills, curricular concepts, historical applications and real world applications. Students will benefit from hands-on and study of concepts they are required to master. Even better the yet, students get to design their own investigations and have ownership of how they investigate the question. By including historical references and aesthetic creativity into the activity a broader group of students can be active, and will succeed in this activity.

MATERIALS
- Sandwich bags
- Scissors
- Scoopula
- Variety of types of paper
- Variety of types of white fabrics
- Water bottles
- Petri dishes

INQUIRY QUESTIONS
- What types of plants can be used to color other materials?
- What parts of plants can be utilized to color other materials?
- Do you get the same color from different parts of the plants?
- What other materials, organic or inorganic can be used to color other materials?
- Do plant materials and inorganic materials color other materials better wet or dry?
- Do organic and/or inorganic dyes color paper or fabric better?

PROCEDURE
A. Sampling Sites - Each class will start on a walk around campus. Students will be allowed to collect any specimens they feel will color.
B. Methodology
   Day One - Write these questions on the board or overhead:
   - Where did you get the clothes that you are wearing?
   - Did you make them? Could you?
   - Do you like the colors of the clothes you are wearing?
   - How are the fabrics colored?
Brainstorm through these questions with the class. List the responses on the board.

Now ask your students to step back in time 150 years. Have them answer the previous questions over again.

Brainstorm the new responses. Discuss how they differ from the first set of responses.

Discuss briefly a modest history of creation of fabrics and dyes.

Introduce a few historical factoids.

How do you think early individuals discovered the materials to color their clothes?

Brainstorm responses with students.

How can we find out what materials in our schoolyard can be used to color other materials?

Lead students through the process of designing an investigation to assess what organic and inorganic materials in our schoolyard can be utilized to color other materials.

Break the class into groups of two.

Circulate and facilitate student design.

Prompt students about the steps of the scientific method.

- Question
- Hypothesis - Is it testable
- Prediction - If ... then ...
- Experimentation - controlled experiment, replicates
- Analysis
- Conclusion

Prompt students about the proper design of a controlled experiment.

- To finish the period, students will take a walk to collect heir samples. Students will collect samples of inorganic and organic materials in sandwich bags.

Day Two - Students will be given 30 minutes to complete their investigations, and prepare their presentations.

Students will present their results in the last 25 minutes of the class period.

RESOURCES

Internet web sites dedicated to natural and vegetable dyes, enjoying nature with your family, Michael Cihner, Cherokee plants, Paul B. Bamel & Mary U. Chiltoskey, Natural dyes, Dianne N. Epp.

BUDGET

- Paper
  - Sketch
  - Copier
  - Blotter
  - Cloth
- Cloth
  - Nylon
  - Wool
  - Cotton
- Petri Dishes
- Sandwich Bags
EXTENSION
Lead students toward an Investigation to utilize the data from this activity to identify dyes for fabrics.