

The 5 E's: A Model for Designing Lessons for Inquiry Planner¹

Logistics Information:

- a. Environmental Education Learning Cycle Example
- b. A synthesis of *Project WILD*, *Project Learning Tree*
- c. Iowa Core Essential Concepts
Earth and Space: Understand and apply knowledge of properties and uses of earth materials.
- d. Developed April 16, 2010

Background Information (What do observers need to know about our learners, classroom and school?): Schools will vary

Materials Required:

A mystery bag containing chocolate candies, for paper making see list (*Project Learning Tree*, p. 224)

Time Period:

Three to four periods of 45 minutes

Name of the Unit: *Resource Go Round* (*Project Learning Tree*, p. 355); *Make Your Own Paper* (*Project Learning Tree*, p. 224)

- I. Plan of the Unit
 - a. Goal of the unit: Students will summarize changes in both culture and technology as they explore the history of papermaking; Students will describe the steps of papermaking process and identify the elements and outputs of the process
 - b. How this unit related to the curriculum:

| Previous Grade/Course | Current Grade/Course | Next Grade/Course |
|--|---|--|
| 3 rd Grade (Earth Science)/ Recycling | 4 th Grade (Earth Science) Ecology or Earth Week, follow up to Earth Materials | 5 th Grade (Earth Science)/Environments, Water Planet |

- c. Lesson Plan: Phases in a 5E Learning Cycle (in no particular order) are Engage, Explore, Explain, Elaborate, and Evaluate. There may be multiple experiences in each phase.

¹ Adapted from *Teacher to Teacher: Reshaping Instruction Through Lesson Study* (NCREL, 2002)

| Phases of the lesson: learning activities and key questions (and time allocation) | Student activities/ anticipated student reactions or responses | Teacher’s response to student reactions/ Things to remember | Evidence of Student Understanding |
|--|---|---|--|
| <p>ENGAGE: Hold up a Mystery Bag and tell the kids the bag contains a natural resource. (The bag contains chocolate candy such as Hershey’s Kisses)</p> <p>EXPLORE: Reveal the contents of the mystery bag and share with class.</p> <p>Hold up a pencil and have the kids to draw a picture of it. Ask the class to list off the parts of the pencil and also where those materials come from and label their drawing.</p> <p>EXPLAIN: Students then find a common item in the classroom (stapler, pen, etc.) and create their own detailed and labeled drawing.</p> | <p>Kids come up with ideas of what could be in the bag.</p> <p>Students list items such as wood, paint, lead (graphite) metal, eraser rubber and label on their picture.</p> <p>Students may choose items that are overly complex to explain (i.e. computers or televisions).</p> | <p>Teacher encourages thinking by answering questions and building on their knowledge, also by keeping focus. Give further clues:</p> <ul style="list-style-type: none"> • it was once alive • it grew • it comes from a plant • it is edible • it is delicious! <p>Teacher can encourage kids to think of the items and also how they were created.</p> <p>Introduce the term “raw materials” and how this differs from end product. See page 355-356 in <i>PLT</i> for suggestions and background information.</p> <p>Teacher should encourage the exploration of simple items, and reinforce terms “raw materials” and “end product.”</p> | <p>Students come up with appropriate responses.</p> <p>Students create a detailed scientific drawing of an item labeled with parts, what the natural resources are, and how they fit together.</p> |

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| <p>ELABORATE: <i>Paper Civilizations (Project Learning Tree, p. 407)</i></p> <p>Paper making lesson (<i>Project Learning Tree, p. 224</i>)</p> <p>EVALUATE: Students create something they can keep from the paper they created such as a card, wall hanging, letter to a family member, etc.</p> | <p>Students read and summarize the information into a timeline. Refer to <i>Project Learning Tree</i> page 409.</p> <p>Students use materials to create their own paper</p> | <p>Help with discussion and work.</p> <p>Teacher models the procedure and monitors progress. Be aware of safety issues with the lab and also time commitment required.</p> <p>Teacher may consider how energy is used to make paper, i.e. solar energy versus physical activity of the students’ creations.</p> | <p>Students work together to create a class timeline on the history of papermaking.</p> <p>Students understand that natural resources are used to make paper and it is a renewable resource. Students understand the process that goes into making paper.</p> |

EXTENSIONS

- Make jewelry from metal to show uses of other natural resources.
- Use a rock tumbler.
- Create paper products out of recycled paper from the classroom.
- Research how materials come from raw materials, i.e. glass, aluminum cans, etc.
- Share their paper products with younger classes and teach how it is made.
- Film the process and turn into a presentation.
- Prepare a poster that explains the cycle they used to make paper.
- Create natural dye for making tie dye clothes.

ADDITIONAL RESOURCES

From Tree to Paper by Pam Marshall