LESSON 4

Making a kNOweeds Journal

Grade level: K-8
Subject Areas: Science, art, forestry
Duration: 45 minutes, additional class session needed for optional papermaking activity
Setting: Indoors or Outdoors
Season: All
Conceptual Framework Topic: Plants provide products of economic value.

OBJECTIVES

Students know the importance of wood products to people and the process of how paper is made as they make their own kNOweeds Journal. Students are able to use the journal as a tool for scientific journaling.

METHOD

Students create a field journal for use on class field studies or on their own. ***The kNOweeds Guide offers a number of lessons that would be enhanced by the use of student field journals.***

MATERIALS

- ✎ Hole Puncher
- ✎ Blank Unlined 8.5" x 11" Paper
- ✎ Cardboard
- ✎ Card Stock
- ✎ Twine
- ✎ Scissors

MATERIALS FOR PAPERMAKING *(optional)*

- ✎ Papermaking mold (screen) and deckle. Kits are available from craft shops, art supply stores, and toy stores
- ✎ Toilet tissue, facial tissue, paper towels, or paper from the recycling bin
- ✎ Large mixing bowl
- ✎ Wire whisk or hand egg beater
- ✎ Large plastic bin large enough to accommodate the papermaking mold and deckle
- ✎ Kitchen towel, newspapers, or paper towels, folded
- ✎ Spatula
- ✎ Rolling pin
- ✎ Cookie sheet or other flat surface
- ✎ Dried flowers or leaves (optional)

BACKGROUND

A journal is a useful tool in the study of plants and the problems associated with invasive plants. Scientists use journals to keep written records of their work. *Scientific journaling* provides a method for students to record and understand science phenomena. Students gain the following skills through regular use of scientific journals:

- Making observations
- Recording events
- Communicating understanding of concepts
- Communicating observations and ideas
- Developing organizational skills
- Developing questioning abilities
- Practicing and developing fine motor skills
- Expressing information in graphic forms
- Analyzing data
- Linking disciplines
- Communicating classroom activities with parents
- Reflecting on what they have learned

A kNOweeds Journal can be used for a wide range of expression and serve as a tool for students to learn skills in science through discovery and record-keeping. Sketches are a quick way to capture the way things look. Written observations can serve as the basis for a great range of scientific as well as creative writing.

PROCEDURE

Making kNOweeds Journals

1. Guide students in the creation of a half-sheet sized field journal for each student. You may elect to further the lesson of the value of plant resources by having students make their own paper for their journal cover, similar to the papermaking process used when trees are processed into paper or waste paper is recycled.

2. *Optional: To make the cover from recycled paper and perhaps other plant material, students will follow steps a-f below. Otherwise, cardstock can be used and you can proceed to step 3.* This activity can be messy so ask students to wear old clothes. If it's a nice day, you may do this activity outside. If you are inside, place a layer of newspapers on the floor underneath your work area. Before you begin, gather all of your supplies together and put them out on the counter. Read all of the directions from start to finish to become familiar with the procedure, then proceed as follows:

a. Tear up about 4 cups of paper (no glossy paper such as found in magazines) into pieces about the size of a postage stamp. Place these into the mixing bowl. Next add enough warm water to cover the paper (about 1-2 cups should do). Watch as the paper starts to absorb water and break down into soggy mush. What you are seeing is the wood fibers in the paper separating from one another. Papermakers call this mushy solution "pulp."

b. Using the wire whisk or hand egg beater, mix the pulp until the fibers are separated and evenly distributed. No large clumps should remain. You may use your hands to break apart any remaining lumps.

c. Pour the pulp into the large plastic bin, and add more water until the bin is about half full. This watery mixture is called slurry. Stir the slurry around with your hands. The consistency should be similar to very thin oatmeal. The thicker the slurry, the thicker your piece of paper will be. If it is too thick, add more water. If it is too thin, make another batch of pulp and add it to the slurry a little at a time until it reaches the desired consistency.

d. Fold the kitchen towel, newspapers, or paper towels into a thick pad (about 1 inch thick) and about the size of your papermaking screen, and place it on the cookie sheet. This pad is called a couching (pronounced "cooch-ing") mound.

e. Pour the slurry onto the screen until the screen is covered with a complete layer. Press the moisture through the screen, which will allow a layer of damp paper to be left behind against the screen. Decorate with leaves or flowers while damp by pressing them into the slurry as desired. Turn your damp sheet of paper onto the couching mound. Allow to dry before handling.

f. Use this handmade paper in the creation of a cover for your journal.

3. Holes can be punched through the pages and cover to provide a place to bind or tie together the journal using twine, thin wire, or other materials. As the journals are being put together, you can discuss with students the importance of forest products in Montana, and ask students to brainstorm a list of wood products, such as materials they are using to make their journal, that are important in their lives as you record them on the board.

Using the kNOweeds Journal

A number of the lessons in the kNOweeds Guide call for journals to be used. The following are tips for implementing the use of science journals with students:

Oxeye Daisy
Chrysanthemum leucanthemum vulgare

1. Select a format that works with the goal or activity such as quick experiments, studies around a theme, or ongoing observations. Depending upon the learning goals it is possible to have multiple journals/notebooks in process at the same time. For example – the class might have a weather log; each student might have a daily nature observation log, and a journal for a specific topic such as invasive plants.

2. Date entries – concepts can be built upon and lead to the analysis of patterns. Dating entries helps to reinforce the importance of regular journal entries.

3. Drawings are an important part of the notebook as they help students express complex ideas.

4. Provide a context before the lesson or activity and include ideas about what the students might observe, write, or draw in their notebooks.

5. Keep your own notebook and share it with the students. This will help you understand what the students are experiencing.

6. Make routine observations – same time daily, weekly or monthly. This helps students see patterns and analyze changes. Observation topics might include the environment, weather, seasonal changes, the view from the classroom window, the students' height.

7. Allow time during activities and experiments for students to record observations.

8. Observe how students are recording information – use those observations to guide future activities. For example, if students are mainly writing and not drawing, explain the importance of visual representations for the information.

9. Before assessing the notebooks, determine what needs to be assessed: scientific content, observations made, writing and grammar, or other aspects.

10. Have students use journals to share what they have learned and their understanding of the topic with other students and their parents. This helps reinforce their understanding of the material and can help identify any misconceptions the students might have.

11. Use the journals for other assignments and projects. For example, if the students are writing a paper on their favorite animals, their science journal could be a place to record their research and observations or serve as a resource for information.

12. Encourage students to review previous journal entries to answer questions for new assignments or formulate observations based on their expanding experiences.

The following are some additional ideas for using journals as students learn about invasive plants.

I Think, I Saw, I Discovered

This method allows students to make predictions, record their observations and summarize the activity. The three topics for this type of entry are:

- Hypothesis – what they think will happen
- Observations – what they saw/observed, data, questions
- Conclusions – what they learned, their conclusions, their thoughts

This method is a good introduction to the scientific method and is appropriate for early elementary students.

I Know, I Wonder, I Learned, Now I Wonder

This method consists of four parts, with the emphasis on what is known and learned from the activity/experiment as opposed to the observations and conclusions. Students have a chance to express what they already know before starting and what new questions they have based on the experience.

The four topics to cover include:

- What they already know about the topic
- What they would like to learn about the topic
- What they learned during the activity/experiment/unit
- What additional questions were raised

This approach gives students practice with reviewing and monitoring their own learning.

"I Used to Think But Now I Know"

This method helps students record how their thinking has changed.

*I used to think*_____*but now I know*_____.

Extensions

Keep a ***kNOweeds Journal*** ongoing throughout the school year, using it as a record and reference during ***kNOweeds Guide*** classroom lessons, field trips, research assignments, experiments, and community projects. Have students individualize their journals with art, daily entries, and feedback about their experiences.