Lesson 6

One Step at a Time

FOCUS

Students will identify choices they make as consumers that impact the environment. They will explore the possibility of committing to lifestyle changes that favor sustainability.

CONCEPTS

- The knowledge that Earth is a closed system may foster an attitude of stewardship toward the environment. Consumers and industry may share environmental concerns and responsibility for the environment. More companies are beginning to practice sustainable manufacturing and are responding to consumer demand for recycled, recyclable, or otherwise environmentally friendly products.
- Humans, acting individually, as a community, or as a part of a business, can cause changes in their immediate environment that affect other people, places, and future times. Humans can determine their impact on the environment and choose to change their actions or lifestyles in ways that favor sustainability.

LEARNING OBJECTIVES

Students

- generate a list of sustainable choices that they, as individuals, can make;
- explore a number of possible lifestyle changes and decide which, if any, they would like to practice for at least a month; and
- track the results of their choice.

PREP TIME: 5 MIN.
Set up VCR; preview video *The Power of One.*

CLASS TIME: 45 MIN. for initial discussion
This is a long-term activity extending over one month.

Subject Areas:

Science

Social Studies

Math

Language Arts

Citizenship

Skills:
Analyzing, discussion, journaling

Materials:
- Notebooks for students
- *Power of One* video

Key Vocabulary:
Sustainable, habit, back-casting

background

Making reasoned choices can increase students' confidence and sense of personal integrity as well as increase their knowledge and skills. Hands-on, experiential activities with visible, immediate results are appropriate for members of this age group, who in most cases are still at the concrete cognitive level.

In this lesson the teacher and students review what they've learned about the product cycle for shoes in general, and how the product cycle can be used as a starting point for thinking about and practicing sustainable manufacturing and consumption. They review the "rules for sustainability" and the "winning principles" (strategies). Students are then asked to practice an environmentally related behavior for three weeks, and evaluate the challenges and environmental impacts of their choice.

A holistic approach to resource conservation – one that integrates the interests of society, economics, and the environment – underscores the fundamental concept that "on a finite planet [everything] is indeed all connected." (*Sustainable Development: Education for Sustainability*, Curriculum Services Branch of Manitoba, Canada, n.d.)

Cooperation in conserving resources is key to sustainable communities. Consumer beliefs and practices can influence businesses to practice sustainability – i.e., "closing the loop" through judicious use of resources, and by heeding the science of and, therefore the mandates implied by, Earth system conditions.

PROFILE:
WHAT ONE (GREEN) SCHOOL CAN DO
Cedar Drive Elementary, Coquitlam, British Columbia, Canada

First- through fifth-graders at this Canadian elementary school love to save energy. In the last year, they saved

- 72,499 kilowatts of electricity,
- 487 gigajoules of natural gas, and
- $5,713.

How do they do it? By turning off lights when they're not being used, having litterless lunches (students bring bulk food items for lunch twice a month), and participating in "cool school days" (lowering the school's temperature to 8.5 degrees Celsius [about 47 degrees Fahrenheit] and wearing hats, jackets, and gloves in the classroom).

Why do they do it? They believe that everyone can make a difference, even in a small way. So they choose to use less energy to cut down the amount of greenhouse gases that enter the Earth's atmosphere.

Their efforts are part of the "Green Eye Energy Audit," an activity inspired by the school's Destination Conservation Curriculum, created by the Sage Foundation. Over a three-year period, the foundation trains teachers and janitors about

- energy, waste, and water conservation (first year);
- putting conservation into practice; and
- conducting school energy audits.

Teachers and janitors educate the students, and the entire school community, including parents, supports their efforts, even at home. More than facts, students are learning where energy comes from and at the same time sharpening their thinking skills.

(***Source:*** Chloe Frommer, "Green Schools," Co-Op American Quarterly, No. 51)

Procedure

1. Review the concepts students have covered during the Air to Earth lessons.
   - Discuss specifically the four winning principles (strategies).
   - Recall examples of steps that manufacturers such as Nike, Stonyfield, Inc., FedEx Kinko's, and others take to produce their goods while trying to meet the system conditions. (Recall the Reuse-A-Shoe video and see Case Studies beginning on page 61.)
   - Ask your students the following questions:
   - Why do you think manufacturers are producing their goods in more sustainable ways?
   - What goals are they trying to achieve?
   - What would be your goals for sustainability?
   - Are there things that individual students can do to live in a more sustainable way?
2. Ask students whether they think consumers as individuals can also take responsibility for creating sustainable societies. Can one individual have any effect on a large world issue, like sustainability?

   Show the video *The Power of One*. Ask students to react to the last few frames of the film (Do something. Anything.).

   After viewing the video, would they change their answers to whether or not one individual can make a significant change to a larger issue?
3. Introduce the term **back-casting**. Simply put, this means that manufacturers must look at the end result they hope to achieve and then work backwards from that point to determine how to reach their goal. Back-casting changes the design question from "Hey, where are we going?" to "O.K., we know where we're going, now what's the best way to get there from here?" This is very important when systems are complex.

   To use a familiar example: *A student in fifth grade wants to play high school basketball. What will the student have to do now, in fifth grade, to reach this goal? (Practice daily, stay healthy and physically fit, join the school basketball team, maintain good grades and graduate.)*

   Take the discussion a step further. *What will the student need to do to accomplish each of these steps? (Buy or borrow a basketball, find other people to play with, eat a balanced diet, exercise daily, tryout for the basketball team, do daily homework, etc.)* The list can continue in some detail. This activity would lend itself to concept mapping or a word web.
4. Explain that they will have a chance to do an experiment if they wish: an individual activity involving sustainability. But first they are going to think about some goals for sustaining the earth and improving its environment. They will "back-cast" or identify some of the steps necessary to reach their goals.

   Ask students to brainstorm, with the class, actions that individuals can take to impact the environment in a favorable way. Write the list on the chalkboard or overhead projector. ***Examples:*** purchasing one large bag of potato chips and reusing it vs. buying individual 1-time-use bags, which create more waste; recycling newspapers or aluminum cans; canceling newspaper or magazine subscriptions and using the Internet instead; turning off lights in unused rooms; walking to school instead of using a car; asking parents to buy organically grown produce; participating in the Reuse-A-Shoe program; etc.

   After students have generated a number of ideas ask them to choose the ones they can control. For example, students may not be able to drive recyclables to a nearby recycling center, but they can use the aluminum recycling bins in the school cafeteria. When students have identified the decisions they can control, have them list them on a piece of paper.

5. Working in cooperative teams students discuss these lists and identify their positive and negative effects on the environment. (See sample chart.)

Action	Positive effects	Negative effects
Recycling newspapers	Reduces the use of tree resources, conserves landfill space.	Fuels are used to transport newspapers.
Buying organic produce	Reduces use of harmful chemicals.	Faster spoilage of food may result in waste.

6. Encourage students to take charts home and discuss them with an adult. This will give students a broader sense of the feasibility and potential results of their environmental choices. Older or advanced students may also be able to research some of their suggestions in the library or on the Internet.
7. It is currently believed that any activity carried out for at least 21 days becomes a habit. After students have sufficiently studied their original lists, explain that they can to put these actions into practice if they wish. Over the next month students will be asked to participate in an experiment. In this experiment they will attempt to make three environmental changes and monitor the results.
8. Ask students to choose one action to perform for one week. The next week they'll choose a second action to do in addition to their first choice. The third week they'll add another action. They will then continue all three actions for the rest of the month. (***Note to teachers:*** It is important that the actions are chosen by the students and not suggested or dictated by the teacher. The activity will only make an impression if students make choices and changes that they can control. Some students may decide that the most environmentally sound thing to do is to take no action. This is a valid choice.)

9. During the month, have students log their progress. Invite them to record (every day or week, depending on the action) whether they've been able to do the action they chose Suggest that they write about their challenges and successes. You may wish to collect, read, and grade journals; however, if students prefer that certain entries remain confidential, encourage them to fold over and staple shut the pages they want to keep private.

   Students who have chosen not to act can also write about their choice. Have they learned anything new that might change their mind? Has choosing not to change some of their behaviors been easier or more difficult than they thought it would be? Give the students opportunities each week to discuss their challenges and successes if they wish.

10. At the end of, or throughout the month, ask students to estimate the effects of their changes on the environment. For instance, they may be able to calculate the number of hours they did not use electricity in unused rooms and the number of kilowatts saved. They may be able to count the sheets of paper saved by using both sides of a sheet.

    Use the following or similar questions to discuss the project:

    - How do you feel about the environmental choices you've made?
    - Was it easier or more difficult than you originally thought to put your choices into practice?
    - Did you change any of the behaviors you planned, or not follow through on others? Why/why not? Explain.
    - What was the most important thing you learned by participating in this project?
    - As consumers, what options/choices do we have that could affect how manufacturers produce the things we buy?
    - Explain what you think the phrase "vote with your dollars" means. Could this practice influence manufacturers?
    - How can consumers let companies know they want products that were produced with as little negative impact on the earth as possible? (You may want to show *The Power of One* video again here.)
    - Discuss the power of each individual to make a profound change in society. Do they think they, as individuals themselves, could effect significant change?

Evaluation

At the end of the experiment, students discuss the follow-up questions. Look for responses that demonstrate their understanding and application of product cycle/systems thinking. Encourage higher-level thinking (analysis, synthesis, and evaluation), including the ability to make recommendations for follow-up actions that they as individuals or as a class can take.

∞

Enrichment

1. Students may wish to tally the results of their efforts as a class. Some of their choices/actions will be easy to assess quantitatively; others will be more difficult.
2. Have students write articles for the school or local newspaper about their efforts.
3. Students can write or e-mail manufacturers and ask these companies about their efforts to produce consumer goods with attention to the principles of sustainability and in accordance with Earth system conditions.
4. Encourage students who wish to do so, to continue with their actions.
5. Students may wish to research companies that are practicing sustainable manufacturing practices, and how they are working with consumers to get their message out. (See Internet Resources, in the Resource Guide, for starting points.)