

Green by Design

This lesson was created as a supplement to the *Green by Design* program at the National Building Museum. It is designed to be used in your classroom independently, or as an activity before or after a school program at the Museum. For more information about and to register for the National Building Museum's school programs, visit <http://www.nbm.org/schools-educators/school-visit/>.

The *Green by Design* program helps fourth through ninth grade students understand the issues associated with making environmentally friendly living decisions and the effects of these decisions on their surroundings. It encourages young people to explore how design decisions are made and how they impact the natural and built environment.

National Building Museum

Created by an act of Congress in 1980, the National Building Museum explores, celebrates, and illuminates achievements in architecture, design, engineering, construction, and planning. Since opening its doors in 1985, the Museum has become a vital forum for exchanging ideas and information about such topical issues as managing suburban growth, designing and building sustainable communities, and revitalizing urban centers. A private, nonprofit institution, the Museum creates and presents engaging exhibitions and education programs, including innovative curricula for school children.

Over the past two decades, the Museum has created and refined an extensive array of youth programming. Each year, approximately 50,000 young people and their families participate in hands-on learning experiences at the Museum: 2-hour-long school programs for grades K–9; major daylong festivals; drop-in family workshops; programs helping Cub and Girl Scouts earn activity badges; and three innovative outreach programs, lasting between 30 and 60 hours, for secondary school students. The Museum's youth programming has won the Washington, D.C., Mayor's Arts Award for Outstanding Contributions to Arts Education and garnered recognition from the National Endowment for the Arts.



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Apple Diaries*

The things we buy and eat are often from faraway lands. People can get fruit and vegetables that aren't native to the farms in their surrounding area. They can also get fruit and vegetables year round when they aren't in growing season in their region. The environmental impact of shipping food long distances is hard to recognize when shopping in a supermarket with little information about where the food was grown and how it traveled to the store. The exact impact to the environment is also very difficult to measure. This lesson helps students begin to think about these topics in a new way. The concepts of supply and demand, transportation, local vs. global, and environmental impact are all introduced in this lesson. The topic is a large one and can be approached with varying levels of detail and layers based on the students' age.

*This lesson plan was developed by teachers and educators participating in the National Building Museum's workshop on Environmental Education entitled "Teaching your students to go green at home and at school!" which took place in December 2006.

OBJECTIVES

Students will be able to:

- investigate how the demand for apples year round affects the global supply of apples;
- become familiar with the types and amount of energy used to transport produce locally and globally;
- consider the environmental cost and discuss pros and cons of "buying local" and globally; and
- propose ways to make purchasing decisions.

NATIONAL STANDARDS OF LEARNING

Math Problem Solving
Social Studies 1, 2, 3
Technological Literacy 18, 19, 20
Visual Arts 3

DURATION

2 class periods,
45–60 minutes each
depending on research time, may
assign research as homework

MATERIALS

- Apples
- *Apple Diaries* worksheets (1 for each student)
- World map
- String and push pins (or another way to demonstrate original location and distance on map)
- Access to library or Internet for research

TEACHER PREP

- Photocopy *Apple Diaries* worksheets (1 for each student)
- Purchase apples or have students purchase apples

LESSON PROCEDURE

1. **Discuss Where Apples Come From**
2. **Research How Apples Travel**
3. **Discuss Students' Findings and Compare Choices.**

VOCABULARY

"Buying local," conserve resources, economics, embodied energy, energy, energy cost vs. monetary cost, energy efficient, environmental cost, environmental impact, fuel, geography, locally grown, personal footprint, produce, supply and demand, transportation

LESSON PLAN

1. Discuss Where Apples Come From

Ask the students where they buy their apples and do they know where those apples come from?

Introduce the Apple Diaries. Tell students that they will spend some time discovering where apples come from.

Homework Assignment: Have students buy an apple, being sure they know where the apple was picked (i.e. label on the apple). Have students fill out the *Apple Diaries* worksheet.

Using a map of the world, ask students to mark where their apple comes from. Discuss the findings. Are the students surprised by the global locations? Why do they think apples come from far away places such as Israel, South Africa, etc.? What do they think the environmental cost is to ship apples from far away places instead of buying apples grown locally? Can you grow apples locally?

2. Research How Apples Travel

Discuss supply and demand, environmental cost, energy, etc. Have students research the environmental cost of transporting their apple to their community. Research can be done individually, in groups, or as a class. Be sure to have at least one locally grown apple for comparison. Suggested research:

- find the general distance between the school and where their apple came from (the last line of the Apple Diaries),
- the types of transportation that could be used when transporting their apples,
- the types of fuel needed for the transportation,
- write letters to an apple distributor asking how apples are shipped,
- create a transportation timeline for (all or a selected number of) apples.

3. Discuss Students' Findings and Compare Choices.

Suggested questions: Why do they think apples come from far away places? Why do they come from so far away? (Seasons, taste) What influences the shippers', grocery stores', and individuals' decisions when selling and buying apples?

Compare and contrast local and global choices. What is the environmental cost of both choices? What is the more energy efficient/environmentally friendly option?

Optional for older students:

- research additional pros and cons of buying local vs. globally (i.e. nutrition, jobs, etc.),
- create a comparison chart of all apple locations (where do most apples come from?)

TAKING IT FURTHER

1. **Create a class play: Two apples from different geographic locations meet and share their stories**
2. **Apple travel journal: What is the apple's experience while traveling?**
3. **Draw/paint/sculpt the life cycle of each apple (from seed to composting).**
4. **Poem/short story from the local and global perspectives.**
5. **Visit from local farmer.**
6. **Letter to the editor or grocery store asking for more locally grown produce.**
7. **Create advertisement sharing the benefits of locally grown produce for the school lunch room.**
8. **Calculate the cost of transporting 1000 apples from grower to your local store via truck, ship, airplane, etc. using gas mileage and gas prices.**

Apple Diaries Student Worksheet

NAME: _____

Type of apple _____

Grocery store/place where apple was bought _____

Cost of one apple _____

Where apple was grown (read label) _____

Number of miles between where apple originally came from and school _____