



Grade Level: Middle School

Subject Correlation: Social Studies, Math

Objectives: Students will appreciate humans' reliance on limited natural resources and become conscious of the concept of sustainability and sustainable living. **Students will be able to:**

1. Describe how and why humans use natural resources and the problems associated with their use.
2. Appreciate the interdependence between humans and nature.
3. Describe and demonstrate behavior showing an appreciation for environmental preservation.

Length: 45-60 minutes

Teacher Preparation: bring in one or two good-sized apples and a knife to class. If possible, reserve time in the computer lab for students to take the Ecological Footprint Kids Quiz during this lesson.

Outline (with times)

10 minutes

Introduction: The Allegorical Apple – this exercise should help students appreciate the earth's limited natural resources at our disposal.

The teacher will present a good-sized apple to the class and explain that in this allegorical exercise the apple represents the Earth. Cut the Earth into four pieces and discard three of the pieces representing saltwater oceans, 75% of the earth. Slice the remaining piece of earth in half and discard one piece representing land which is inhospitable to people such as deserts. Slice the remaining 1/8 of the Earth into four sections and set aside three of the sections representing areas too rocky, too steep, or too cold to produce food. Carefully peel the skin off the remaining 1/32 slice of the earth. This represents the surface of the earth, the earth's crust with its topsoil which humanity depends on. The earth's topsoil is only about five feet deep and produces a relatively fixed amount of food. Over farming and erosion take away 24 billion tons of topsoil per year. Each inch of top soil requires 100 years to form.

This exercise demonstrates to the students that, despite how large the Earth may seem, the amount of land available for people to use is limited and we must use it carefully. Students are now ready to take the Bobbie Bigfoot Quiz to see how their daily decisions affect the amount of natural resources they use on a daily basis.

5-10 minutes

Pre-Quiz Questions

Develop three to five questions pertaining to the questions in the Bobbie Bigfoot Web site exercise. Examples:

1. What is “*energy*” and how do we use it in our daily lives? Give some examples. What are some different *sources* of energy? (*wind, water, solar, nuclear, fossil fuels, biofuels, natural gas, hydrogen*) Are some sources of energy more environmentally friendly than others?
2. What are natural resources? Give some examples.
3. What makes cars run? (oil/gasoline) Where does gas come from? (*Can be more or less specific – oil, Middle East, dinosaurs and other living things from millions of years ago.*) Is the world’s supply of gasoline unlimited? (No.) What are some problems with using oil and other *fossil fuels*? (pollution, extraction of oil, transportation of oil, limited quantities of oil....) Are there alternatives to gas powered engines? (*Hybrid cars, hydrogen cars in development, fuel cell cars, biofuel.*)
4. What happens to your garbage when you throw it away? (*It ends up in a landfill and stays there for years.*) What are some alternatives to producing a lot of garbage?
5. What are some things you can *recycle*? Why is it important to recycle?

20 minutes

The Bobbie Bigfoot Ecological Footprint Kids Quiz (if you have access to a computer lab or computers in your classroom, take the quiz individually and leave time to discuss answers as a class. Students can also work in small groups or some students can work on computers while others answer questions or do the Allegorical Apple exercise.)

Class Questions for discussion:

1. What kinds of activities cause Bobbie’s foot to grow? Shrink?
2. Name three actions or decisions Bobbie made that caused his foot to grow or caused his foot to shrink.
3. Why is it important to make decisions in your daily routine that do not waste energy, use too many natural resources, or produce too much garbage?
4. Describe three things you can do every day to save valuable natural resources.



What is Sustainability?