

**LEVEL:** Grades K-12

**SUBJECTS:** Science, Social Studies, Environmental Education.

**PROCESS:** Through using sponge pieces and water in a demonstration, students discover that human populations are resource consumers.

**OBJECTIVES:** The student will:

1. Describe at least one personal demand he or she places on a natural resource.
2. Explain what happened in the visual demonstration of sponges and water, and how it represents human resource consumption.
3. Demonstrate the effects of growing populations on available natural resources using real life examples.
4. Give at least one example of conserving a natural resource and justify why it is important to do so.

(Note: all four objectives are appropriate for upper grades; primary grades may only accomplish objectives one and two.)

**TIMEFRAME:** 40 minutes to 1 hour.

**SKILLS:** Discussing, drawing, identifying, inferring, observing, problem solving, taking responsibility, understanding cause and effect, valuing, (drama).

**MATERIALS:** A big, clear container with a wide mouth opening, four sponges cut into eight pieces each, water, bowl, marker or masking tape, paper towels, drawing paper and materials.

**VOCABULARY:** Conserve, consumption, demands, environment, increase, natural resources, population.



## DON'T USE IT ALL UP

**OVERVIEW:** This lesson is not meant to foster anxiety or a doomsday foreboding in students. Rather, it is an introduction to how growing populations can affect the environment and the positive steps individuals and communities can take to lessen the strain on natural resources.

With the Earth's population likely to exceed six billion persons and projections to double to 11 billion by the year 2050, the strain being placed on natural resources is greater than ever before. The sun, water, air, and soil are the most vital natural resources, since all other resources depend on these four for their existence.

The more people in a given area, the more quickly natural resources can be used up. The solution, aside from population control, is conservation and careful use of available natural resources. Conservation practices include reducing the amount of natural

resources consumed. Recycling, reusing, and rethinking (substituting plentiful materials for more scarce ones, and finding alternate energy sources that are renewable) are all ways to reduce the consumption of natural resources. Additionally, consumers can refuse to buy products that are not recyclable or biodegradable, or that are considered over-packaged.

This lesson is very effective as an introductory or culminating activity for the study of any natural resource, including water, air, trees, wildlife, and soil. In order to provide examples for this lesson, it is helpful to have researched the specific natural resource, how it can or is being depleted, and how it can be conserved and/or replenished.

Using water as an example, people need and use water daily in many ways, and often in unrealized amounts. Water is used directly for drinking ( $1/2$  gallon/

day), cooking (5-10 gallons/day), bathing (20-35 gallons/day), toilet flushing (21-40 gallons/day), etc. We also use water in many indirect ways such as in the production of manufactured items and food, preparation of food, cooling and heating, etc.

There is an abundance of water on this earth. Unfortunately, nearly all of that water, more than 97 percent, is salt water and is neither easily nor economically available for our consumption. Of the fresh water supply (*about three percent of the total amount of water on the Earth*) most is held as inconsumable in glaciers and icecaps. Less than one percent of the water on the Earth is fresh water and is in the form of ground water, lakes, and streams. A dilemma is created when a limited resource, such as fresh water, has many demands for its use.

### **PROCEDURE:**

#### *PRE-ACTIVITY:*

1. Put about four cups of water in the container. Ask the students to pretend that the container represents the earth and the water represents all the available water.

2. Discuss with students the ways we use water (*drinking, irrigation, recreation, cleaning, processing, cooking, bathing, transportation, etc.*). These can be written on the chalkboard for student reference.

#### *ACTIVITY:*

1. With a marker or masking tape, mark the water level on the outside of the container. Drop a piece of sponge into the container as you share one personal demand you made on water today. Remove the wet sponge from the container and have students examine the water level. It probably shows very little change.

2. Ask students, one at a time, to name a personal demand they made on water today while dropping a piece of sponge in the container. The students may begin to notice a change in the water level. After all the sponges have been dropped in the container, soaking up as much water as possible, remove all of them (don't squeeze them out) and set them aside in a bowl. Draw attention to the dramatic change in the water level. Help students understand that the demands of a lot of people have more effect

than the demands of a few people on natural resources. Ask:

**-What happens to the water level as we put in more sponges?**

**-What will happen if we keep using water at this rate?**

**-What can we do about this situation?**

**-How can we give water back to the environment?**

3. Once the students have mentioned reducing, reusing, or recycling take one wet sponge, naming a way you can reduce or recycle, and squeeze the water out of the sponge back into the container. There is a change in the water level, but not much. One person reducing or recycling does make a difference. The impact, however, will be greater when many individuals reduce, reuse, and recycle. Ask:

**-In what ways can you reduce, reuse, recycle, or be more careful about the demands you make on water (or on other natural resources)?**

When students have an idea about how they can give back to the environment, have them squeeze the water out of a wet sponge back into the container sharing their idea with the class. The water level will go up. It won't go back to the original mark, however. Ask:

**-Why doesn't the water level return to the original mark even after all the sponges are squeezed out? (*Even by recycling resources, some of them will be used up.*)**

**-Why is it important to you to reduce, reuse, recycle, and/or make careful demands on water (or other natural resources)?**

**-Can the water in this activity represent other resources people use? What are some resources which cannot be recycled? Name some. How can they be conserved?**

**-What one thing have you learned from this demonstration?** *(Answers will vary, but should reflect an appreciation for the finiteness of many natural resources, the renewability of some, and the desirability of using natural resources wisely.)*

**EVALUATION:**

1. Have students draw a four-picture sequence strip of the steps in the water/sponge activity. When evaluating their work, look for an understanding of what is happening with the water level in the container.

2. Have students draw two pictures. In the first picture, showing themselves making a demand on a natural resource. In the second picture, showing how the demand(s) can be made more carefully (*reducing, recycling, reusing, etc.*).

3. Have students write a statement or paragraph about one or more ways they personally can reduce, recycle, and/or reuse, any natural resources.

**EXTENSIONS:**

1. Use different colored sponges, with each color representing a different natural resource (blue = water, green = plants, yellow = minerals, etc.). Have students identify ways they use water, plants, minerals, etc. each time they drop a piece of colored sponge.

2. Have students draw "Waste/No Waste" pictures showing people "wasting" and "not-wasting." Have students fold pieces of white paper in half and on one side draw a picture showing how they might use a resource. On the other half, students can draw a picture of how they can save that resource.

3. Start a class recycling project. Recycle paper from the classroom, items from the cafeteria, home, etc. Challenge another class to match or beat your efforts.

4. Have students role play a demand they make on a natural resource. Let the student who correctly guesses what is being acted out drop the next sponge in the water and act out another demand on natural resources.

6. Older students can take a different slant on the activity by examining how resources are unequally distributed and consumed around the world. Students use selected thematic maps from an atlas, such as petroleum production and consumption, making observations and analyzing relationships regarding the differences among the patterns shown on the maps.

**RESOURCES:**

*Global Science*, John Christenson, Kendall/Hunt.

Project Learning Tree, 1250 Connecticut Avenue N.W., Suite 320, Washington, DC 20036, (202) 463-2472.

Project WILD, 5430 Grosvenor Lane, Bethesda, MD 20814, (301) 493-5447.

Making Connections: Linking Population and the Environment, grades 4-6, Population Reference Bureau, 1875 Connecticut Ave., N.W., Suite 520, Washington, D.C. 20009-5728, (202) 483-1100 or 1-800-877-9881, \$15.00 plus postage.

Mineral Information Institute, 475 17th Street, Suite 510, Denver, CO 80202, (303) 297-3226, posters "If It Can't Be Grown, It Has To Be Mined" and "From The Earth...A Better Life," single copies free.

**Credit:** Used with permission from Project Food Land & People

