

# Analyzing Ecological Footprints

## Teacher Notes

**TIME REQUIRED** One 45-minute class period, out-of-class time for research

## SKILLS ACQUIRED

Collecting data  
Communicating  
Inferring  
Interpreting  
Organizing and analyzing data  
Predicting

## RATING

Easy ← 1 2 3 4 → Hard

Teacher Prep—1  
Student Set-Up—1  
Concept Level—2  
Clean Up—1

## THE SCIENTIFIC METHOD

**Make Observations** Procedure, steps 1 and 4; Analysis, question 1

**Analyze Results** Analysis, questions 2–4; Conclusions, question 5

**Draw Conclusions** Conclusions, questions 6–8

## MATERIALS

For more information about calculating ecological footprints, look at the Web site of Earthday Network or of Redefining Progress.

If possible, have students complete the ecological footprint survey on one of these Websites to determine the actual size of their ecological footprints. Completing the questionnaire will also give students a better understanding of the criteria that are important in calculating an ecological footprint.

You may also want to have maps showing population density around the world available for the students to use during their research.

## **TEACHERS RESOURCE PAGE**

### Analyzing Ecological Footprints *continued*

#### **TIPS AND TRICKS**

Discourage any biased discussion of students' lifestyles that may arise with comparisons of individual ecological footprint values. In some cases, the scale of the ecological footprint might reflect affluence (e.g., the size of the home, whether the student owns a car, how much the student travels). Treat these conclusions with sensitivity, and emphasize instead how lifestyle choices affect the ecological footprint calculation (e.g., whether the student is a vegetarian, how much the student's family recycles, whether the student or the student's family carools).

You may have to review as a class which countries are considered developed and which are considered developing.

Locating the countries listed in the activity on a world map may increase students' understanding that developed and developing countries are clustered in different regions of the world.

If time or reference materials for this activity are limited, have students work in small groups of two to four students and divide the research tasks among themselves.

# Analyzing Ecological Footprints

Your individual ecological footprint is an estimate of the total area of land or sea required to produce the food, materials, and energy necessary to maintain your level of resource consumption. Ecological footprints can be determined for and compared among entire areas or countries. How large a footprint do you leave on Earth's resources? In this activity, you will compare the ecological footprints of people living in other countries and research the differences in lifestyle of two countries—one with a large footprint, one with a small footprint—to discover the important factors in calculating an ecological footprint. You will also learn how the ecological footprint of the average U.S. citizen compares with that of people worldwide, and you will consider what you might do to reduce the size of your ecological footprint.

## OBJECTIVES

**Graph** the average ecological footprints of several countries.

**Select** two countries with different sized footprints and research the lifestyles of the citizens of the countries you selected.

**Evaluate** what aspects of lifestyle are most important in calculating an ecological footprint.

**Decide** whether any lifestyle changes should or could be made to alter the value of the ecological footprint of the average person in the United States.

## MATERIALS

- colored markers or pencils
- graphing paper
- pen or pencil
- reference books

## Procedure

1. Examine the table of the ecological footprints of different countries. Order the countries from the largest footprint to the smallest. On a separate sheet of paper, graph the value for each country in a different color, ranging from largest to smallest in order.
2. Select two countries from the table with widely different ecological footprints. Record the names of the countries you selected.

**Answers may vary.**

**TEACHERS RESOURCE PAGE**Analyzing Ecological Footprints *continued*

3. Using the Internet, if available, and reference books from the library, research the lifestyles of the average citizens in the two countries you chose. Include information about diet, housing, transportation, types of energy used, average yearly income, cost of living, and, if possible, level of recycling and composting of waste. Also look up the area of the country (in acres) and the total population.

**ECOLOGICAL FOOTPRINT BY COUNTRY**

Country	Ecological Footprint (acres)	Country	Ecological Footprint (acres)
Australia	19	Mexico	7
Brazil	6	Nigeria	3.7
Canada	19	Pakistan	2
China	4	Peru	3
Ethiopia	2	Philippines	3.3
France	13	Russia	11
Germany	13	United Kingdom	13
India	2	United States	24
Japan	11	World Average	5.8

4. On a separate piece of paper, create a table comparing the lifestyle information you found for the countries you selected. Include another column for your own lifestyle information.

**Analysis**

1. **Examining Data** What differences did you find in the typical lifestyles in the two countries you chose to research?

**Answers may vary. Sample answer: The diet in the country with the smaller footprint is based mostly on vegetarian products. In the country with the larger footprint, more meat is consumed. Houses are smaller in the country with the smaller footprint, and transportation is primarily by foot or bicycle.**

**TEACHERS RESOURCE PAGE**Analyzing Ecological Footprints *continued*

2. **Analyzing Data** What differences in the typical lifestyles in the two countries you selected seem to have the most impact on the size of their ecological footprints?

**Answers may vary. Depending on the selected countries, answer could include diet, housing, transportation, energy use, and the availability of goods and services based on the average yearly income and standard of living.**

3. **Analyzing Results** Determine the actual number of acres per person in the countries you selected by dividing the total area of the country (in acres) by the total population. How does this number compare with the ecological footprint of the countries you selected?

**Answers may vary. Sample answer: The country with the larger ecological footprint had a larger area per person, but still not large enough to support the population. The country with the smaller ecological footprint had a smaller area per person.**

4. **Identifying Patterns** Look at the column in your table with the information about your lifestyle. How does your lifestyle compare with those of the people in the countries you selected to research?

**Answers may vary.**

**Conclusions**

5. **Analyzing Graphs** Examine the graph of the ecological footprints by country. Which nation has the largest ecological footprint? Which nation has the smallest?

**The United States has the largest footprint of 24 acres per person. Ethiopia, India, and Pakistan have the smallest at 2 acres per person.**

**TEACHERS RESOURCE PAGE**Analyzing Ecological Footprints *continued*

6. **Drawing Conclusions** Examine the graph again. Can you make any conclusions about how the differences between the standard of living and population density in developing and developed countries affects the ecological footprint value?

**Developed nations typically have the larger ecological footprints because their citizens consume more resources, travel more freely, and typically create more wastes than their counterparts in developing countries. The population density among developed nations is generally smaller, so that more resources are available per person.**

7. **Drawing Conclusions** Do you think your ecological footprint is smaller or larger than the 24 acres that is average for the United States? Explain.

**Answers may vary. Sample answer: My ecological footprint is probably smaller than the national average because my family doesn't eat much meat, we walk or take public transportation often, and we recycle or compost a lot of our household waste.**

8. **Applying Conclusions** How could you reduce the value of your personal ecological footprint? Name at least three ways you could accomplish this through lifestyle changes.

**Answers may vary. Students might suggest taking more public transportation, carpooling, cutting back on animal products, etc.**

**Extension**

1. **Research and Communications** Imagine how different your life would be if you lived in a developing country. Write a story about a typical day in your life, including information about your lifestyle and your impact on the environment.

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### Analyzing Ecological Footprints *continued*

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## Analyzing Ecological Footprints *continued*

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### Analyzing Ecological Footprints *continued*

- 6. Drawing Conclusions** Examine the graph again. Can you make any conclusions about how the differences between the standard of living and population density in developing and developed countries affects the ecological footprint value?
- 7. Drawing Conclusions** Do you think your ecological footprint is smaller or larger than the 24 acres that is average for the United States? Explain.
- 8. Applying Conclusions** How could you reduce the value of your personal ecological footprint? Name at least three ways you could accomplish this through lifestyle changes.

### Extension

- 1. Research and Communications** Imagine how different your life would be if you lived in a developing country. Write a story about a typical day in your life, including information about your lifestyle and your impact on the environment.