
MATERIALS

- Laptop computer
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BACKGROUND

Ecological Footprint

An **ecological footprint** is a measure of the demand humans place on the natural environment. This includes every aspect of your life, from the type of home you live in, your diet, how much electricity you use, trash you produce, miles you drive, etc. In the United States, our quality of life typically results in Americans having large ecological footprints.

One important aspect of environmental science is **sustainability**. Sustainability involves using resources wisely to make sure that future generations also have access to those same resources. When individuals/families/countries have large ecological footprints, they are usually not using resources in a sustainable way. A goal of environmental science is to increase sustainability initiatives.

A great resource for calculating your personal or family ecological footprint can be found here: <http://www.footprintnetwork.org/en/index.php/GFN/>.

Carbon Footprint

Similar to the ecological footprint, a carbon footprint also calculates the demand humans place on the natural environment, but in terms of greenhouse gases generated and used. Greenhouse gases are commonly discussed in the popular media, in particular carbon dioxide (CO_2). The **greenhouse effect** is responsible for making Earth habitable. Without the greenhouse effect, Earth's average surface temperatures would be too low to have liquid water on the surface. Think about when you have gotten in a car during a hot summer day after the car had been sitting in a parking lot in the sun. The air inside the car is much warmer than the air outside the car because solar radiation has come through the windows, been absorbed by the seats and dashboard, but the re-radiated heat cannot escape through



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the windows so the air temperature increases. In the same way, greenhouse gases, such as CO_2 , methane (CH_4), and water vapor, absorb solar radiation, but the heat that is re-radiated warms the atmosphere.

Today, there is significant concern over rising CO_2 concentrations in the atmosphere that might result in an enhanced greenhouse effect that the majority of climate scientists believe is responsible for global environmental change and global warming. Essentially, with higher levels of greenhouse gases in the atmosphere, the atmosphere is likely to be warmer. In a future exercise, we will investigate the carbon cycle and trends in CO_2 .

A great resource for calculating your personal or family carbon footprint can be found here: <http://www.nature.org/greenliving/carboncalculator/index.htm>.

1 Activity

For each question, make sure you include any important graphics you generate or the information on those graphics. Also, you should write a well-developed paragraph with complete sentences and correct grammar usage, and punctuation for other questions where appropriate.

1. Using the links provided above and on the previous page, determine your ecological footprint and carbon footprint. After you determine your footprint, record the information (you can copy and paste graphics into another Word document if that is easier), then repeat the process for the ecological footprint as someone living a primitive lifestyle in the United States (i.e., minimal electricity, waste production, driving, etc.). How does this compare with your personal footprint? Also, investigate how your ecological footprint compares with those from other countries.

