What Is My Carbon Footprint?


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About This Activity

This activity complements the 2012 HHMI Holiday Lectures on Science — *Changing Planet: Past, Present,Future.*

Using an online calculator, you will estimate your household's carbon footprint and explore various actions to reduce it.

What Is a Carbon Footprint?

We use energy in everyday activities, from turning on the lights to driving to school. Most of that energy is derived from burning fossil fuels, which release greenhouse gases (GHGs), such as carbon dioxide (CO_2), into the atmosphere. A carbon footprint is the total amount of GHG emissions caused directly and indirectly by an individual, organization, event, or product. A household's carbon footprint varies depending on factors such as home size, types of vehicles used, and what household members eat and purchase. We care about our carbon footprint because GHGs absorb energy and trap heat in our atmosphere. We need some amount of GHGs in our atmosphere to survive, but too great an amount and too rapid an increase can have devastating effects on our environment, our health, and the economy. Current consumption of fossil fuel releases more than 25 billion tons of CO_2 into the atmosphere every year. If current trends continue, there will be a tripling of atmospheric CO_2 by the end of the century – levels not seen for more than 40 million years. By measuring our carbon footprint, we can learn how we are contributing to this rise in atmospheric CO_2 and how we might use energy more efficiently.

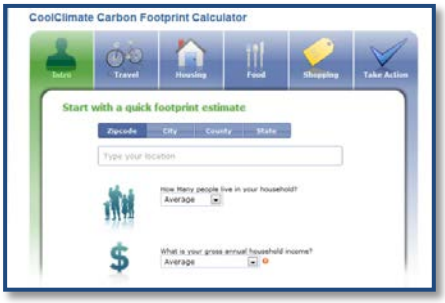
Materials

- A computer with online access
- What Is My Carbon Footprint? Instruction Sheet

Procedure

What Is My Carbon Footprint?

1. Take some time to carefully read through all the steps in the procedure. You may want to list the information you need to collect to make it easier to input the data into the calculator. Your parents or guardian can help you fill in some of the information.
2. Go to the website http://coolclimate.berkeley.edu/carboncalculator.
   Remember, you will be calculating the carbon footprint for your **entire household**.
3. Click on the "Intro" tab of the online calculator. Fill in your zip code and basic information. This populates the calculator with accurate defaults and allows you to see how your energy use compares to that of households of similar size and income in your area. None of this information is saved by the Berkeley website. You may, however, choose not to fill in this section. This will not affect later calculations. Mouse over the orange question mark for more information.



4. On the Data Sheet (on page 5 of this document), write down your zip code of residence (question 1).

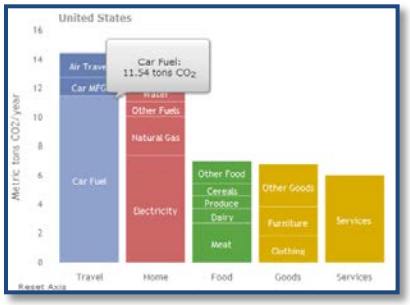
Credit: All screenshot images are used with permission from coolclimate.berkeley.edu

Travel:

5. Click on the "Travel" tab.
   a) Write down how many miles each vehicle is driven in one year.
   b) Write down how many miles per gallon each vehicle gets. If you are unsure, go to https://www.fueleconomy.gov/feg/findacar.shtml. Use the column that best describes the kind of driving each vehicle is primarily used for. For example, if you mostly do highway driving, choose the MPG in the HWY column.
   c) Back on the carbon footprint calculator, write down any public transportation or flights your household has taken in the past year for leisure (not including business travel). You can identify the specific type of public transportation you take by clicking on the advanced tab for more options.
6. See the emoticon on the calculator, which looks like Figure 1.
7. Write down the GHG emissions from your household's **total travel** in tons of CO_2/year on the Data Sheet (data chart in question 2).
8. Look at the graph on the bottom of the carbon calculator (Figure 2). You can see which travel subcategory made the greatest contribution to the total carbon emissions for travel. Mouse over each subcategory to view the tons of CO_2/year emitted.

Figure 1

Figure 2



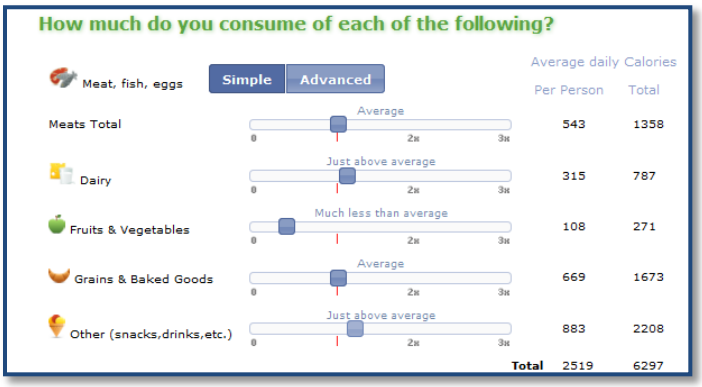
Housing:

9. Click on the "Housing" tab.
   a. Type in your annual electricity, natural gas, heating oil, or other fuel use in this section. Your utility bills will contain the information necessary to fill out this section. For more accurate results, average several months of statements from different seasons to extrapolate energy use for a year.
   b. Under "electricity," you will be asked for the percent purchased from a clean-energy program. Leave this value at zero unless you know that you are enrolled in a utility program that allows customers to pay more for renewable energy.
   c. Estimate how much more or less water your household uses compared to similar households. For example, if you have a large lawn or if everyone takes long showers, then move the dial above average. If you consciously use less water, then move the dial somewhat lower than average.
10. Write down the **total housing** emissions in tons of CO_2/year on the Data Sheet (data chart in question 2).

Food and Shopping:

11. In the next two sections, you will calculate the secondary sources of CO_2 emissions. Producing and transporting our food, clothes, and other supplies require a great deal of energy and produce high emissions of CO_2 and other greenhouse gases.

a) Use your best judgment to fill out this section. For example, if your family eats a lot of meat compared to other families you know, adjust the meat lever up a little from the average.



If you would like to be more precise, spend one day writing a food journal for you and your family. You can calculate the caloric values for each food item by using https://www.choosemyplate.gov/SuperTracker/foodtracker.aspx. On the carbon footprint calculator, move the lever up or down to record the caloric intake from each of the food groups listed in the calculator.

b) For the shopping section, if you think your family buys a lot less than other families you know, adjust the lever down a little from the average. You can also use the advanced feature and input dollar amounts. Remember, the site does not save this information.

12. Write the **total food** and **total shopping** GHG emissions in tons of CO_2/year on the Data Sheet (chart on question 2).
13. Click on the "Take Action" tab. Before you click on anything else, write the **total footprint** in tons of CO_2/year on the Data Sheet (data chart in question 2).

Reducing My Carbon Footprint:

1. List ways to reduce your carbon footprint.

_____
_____
_____
_____
_____

2. Under the "Take Action" tab, look at the list of possible actions. With your parents, decide on some actions that you and your family will try to implement. Place a check mark next to those actions listed on the Data Sheet (question 3).

3. Click on the actions that your family agreed upon (see Arrow 1). For example, if you decided to ride your bike to school, click on "Ride my bike." A pull-down menu will appear. Fill in how much of a change you would like to make.
4. Click on the "pledge" button. That will highlight this button green (see Arrow 2).
5. Repeat for all of the selected actions.
6. Write down the **total reductions** in tons of CO_2/year in the Data Sheet (question 4).

Data Sheet

Instructions: Answer all four questions below. To answer 2–4, you will need the data from the online carbon footprint calculator.

What Is My Carbon Footprint?

1. Zip code of residence:_____
2. Data chart:

	Total Travel (tons of CO_2/year)	Total Housing (tons of CO_2/year)	Total Food (tons of CO_2/year)	Total Shopping (tons of CO_2/year)	Total footprint **before reductions** (tons of CO_2/year)
Your household's carbon footprint					

Reducing My Carbon Footprint:

3. Check the actions your family would be willing to take to reduce your carbon footprint.

☐Buy a more efficient vehicle	☐Maintain my vehicles	☐Turn down thermostat in winter	☐Offset remaining housing
☐Telecommute to work	☐Carpool to work	☐Turn up thermostat in summer	☐Go on a low-carbon diet
☐Ride my bike	☐Reduce air travel	☐Choose Energy Star fridge	☐Go organic
☐Take public transportation	☐Offset remaining transportation	☐Purchase green electricity	☐Offset remaining shopping
☐Practice eco-driving	☐Switch to CFLs	☐Line-dry clothing	☐ Other:_____

4. What is your **total reduction**, in tons of CO_2/year, if you take the above action(s)? _____tons of CO_2/year

Questions:

	Total Travel (tons of CO_2/year)	Total Housing (tons of CO_2/year)	Total Food (tons of CO_2/year)	Total Shopping (tons of CO_2/year)	Total footprint **before reductions** (tons of CO_2/year)
National average carbon footprint	14.6	14.1	7.0	12.8	48.5

1. The chart above shows the national average carbon footprints for different categories per household. How do your carbon footprints compare?

   _____

   _____

   _____

2. In which category does your household produce the largest carbon footprint?

   _____

3. Which specific action contributes to that large carbon footprint? (for example, if housing was the category that produced the largest carbon footprint, was your electricity use or your natural gas use responsible?)

   _____

4. In which category does your household produce the smallest carbon footprint?

   _____

5. From your list of actions to reduce your carbon footprint, select one and explain why you chose that action. Consider how much of an impact this action will have on your carbon footprint and on your lifestyle.

   _____

   _____

   _____

   _____

6. If every household in the US pledged to reduce their carbon footprint by the same amount as your family, how many tons of CO_2 would we avoid putting into the atmosphere? (According to a 2011 report by the US Census Bureau, there are about 114,761,359 households in the US.) Show your calculations.

   _____

   _____

HHMI
HOWARD HUGHES MEDICAL INSTITUTE

Department of Science Education

4000 Jones Bridge Road, Chevy Chase, MD 20815
(301) 215-8500 • biointeractive@hhmi.org