INTRODUCTION

We use energy in everyday activities, from turning on the lights to driving to school. Most of that energy comes from burning fossil fuels, which releases **greenhouse gases (GHGs)**, such as **carbon dioxide (CO_2)**, into the atmosphere. GHGs absorb energy and trap heat in the atmosphere, and we need some amount of GHGs in the atmosphere to survive. But if the levels of GHGs are too high or increase too quickly, they can have devastating effects on our environment, our health, and the economy. Currently, burning fossil fuels releases more than 25 billion tons of CO_2 into the atmosphere every year. If this trend continues, atmospheric CO_2 will triple by the end of the century, reaching levels not seen for more than 40 million years.

A **carbon footprint** is the total amount of GHG emissions, including CO_2 emissions, generated directly and indirectly by an individual, group, event, or product. By calculating our carbon footprint, we can learn how we are contributing to the rise in atmospheric CO_2 and how we might use energy more efficiently.

PROCEDURE

In this activity, you'll use an online calculator to estimate your household's carbon footprint and explore actions to reduce it. A **household** is one or more people, such as a family or roommates, who live in the same home. A household's carbon footprint depends on factors such as home size, what the household members eat and buy, and the types of transportation they use.

Follow the instructions in the sections below to calculate the carbon footprint for your household. Use your best judgment to answer the questions. If you are unsure about the answers, it's okay to estimate or to ask someone else in your household for help. Record your results in Table 1 when directed.

Table 1. The carbon footprint for your household, measured as CO_2 emissions (tons CO_2/year).

	Total **travel**	Total **home**	Total **food**	Total **shopping**	Total **footprint** *before* **reductions**
Your household's carbon footprint					

PART 1: Get Started

1. Go to the website for the CoolClimate Network calculator.

2. Answer the questions in the "Get Started" section. Click the question mark icons for more information.

   - These questions are optional and will not affect later calculations. Answering them helps the calculator give you more accurate default options. It will also let you see how your carbon footprint compares to those of similar households in your area.

   - You may also want to adjust the values in the "Settings" section on the right to get more accurate results.

3. Look at the graph in the "Your footprint" section on the right. This graph will likely change as you add more information in the next sections.

   - If you are interested, you can compare your results to those of other users of the website by creating an optional account in the "Login" section.

4. Click the "Next" button at the bottom of the page to go to the "Travel" section.

PART 2: Travel

This section focuses on your household's vehicles and other types of transportation you use.

5. Answer the questions in the "Travel" section.

    - If your household uses one or more vehicles, estimate how many miles each vehicle was driven in the past year, as well as how many miles per gallon each vehicle gets. If you are unsure, you can use a website such as the U.S. government source for fuel economy information.

    - Estimate how many miles your household members have traveled on public transportation and flights in the past year. You can use the "Advanced" button for more options, such as specific types of transportation.

6. Look at the graph in the "Your footprint" section on the right. The "Travel" bar will show how much each travel subcategory contributed to your household's CO_2 emissions. Hover over each travel subcategory to view the tons of CO_2/year emitted.

7. Add up the CO_2 emissions from the travel subcategories to get the **total travel** CO_2 emissions for your household. Record the result in Table 1.

8. Click the "Next" button at the bottom of the page to go to the "Home" section.

PART 3: Home

This section focuses on how much energy, space, and water your household uses.

9. Answer the questions in the "Home" section.

    - If your household receives utility bills, they will probably contain most of this information. If you live in a place where conditions change a lot depending on the season, you may want to base your estimates on multiple utility bills from different seasons.

    - Under "Electricity," you will be asked for the "percent purchased from a clean energy program." Leave this value at zero unless you know your household is enrolled in a utility program that allows customers to pay more for renewable energy.

    - You will be asked to estimate how much water your household uses compared to similar households. Activities that use water include watering lawns, taking showers, running a dishwasher, etc. If you think you use more water than average, move the slider above 1× (average). If you consciously use less water, move the slider below 1×.

10. Add up the CO_2 emissions from the home subcategories to get the **total home** CO_2 emissions for your household. Record the result in Table 1.

11. Click the "Next" button at the bottom of the page to go to the "Food" section.

PART 4: Food and Shopping

These sections focus on what your household eats and buys. Although eating and shopping may not produce CO_2 emissions directly, making and transporting food, clothes, and other supplies requires a lot of energy, which often means burning fossil fuels and producing CO_2.

12. Answer the questions in the "Food" section.

- It's fine to estimate based on your best judgment. If you'd like to be more accurate, you can do a food journal for a day or record what you eat using a nutrition tracking website or app.

- You can use the "Advanced" button for more options, such as more specific types of food.

13. Click the "Next" button at the bottom of the page to go to the "Shopping" section.

14. Answer the questions in the "Shopping" section.

- Again, it's fine to estimate based on your best judgment. If you think your household buys less than other households you know, move the slider below average, etc.

- You can use the "Advanced" button for more options, such as specific dollar amounts for different goods and services.

15. Add up the CO_2 emissions from the food subcategories to get the **total food** CO_2 emissions for your household. Record the result in Table 1.

16. Add up the CO_2 emissions from the goods and services subcategories to get the **total shopping** CO_2 emissions for your household. Record the result in Table 1.

17. Your household's **total carbon footprint** (in tons CO_2/year) will be shown above the graph. Record this in Table 1 as your total footprint *before* reductions.

18. Click the "Next" button at the bottom of the page to go to the "Take Action" section.

PART 4: Take Action

This section explores ways to reduce your household's carbon footprint.

19. In the website, select the actions that you and other members of your household could take to reduce your CO_2 emissions. Click the arrows next to each action for more information. Record the actions you selected in Table 2 below.

Table 2. Actions you and members of your household would be willing to take to reduce your carbon footprint.

Action name	Tons CO_2/year saved	Dollars saved/year	Upfront costs

20. If you take all the actions listed in Table 2, what would be the **total reduction** in your household's carbon footprint (in tons CO_2/year)?

PART 5: Analyzing Your Carbon Footprint

Answer the following questions based on the carbon footprint for your household. You may want to look at Table 1 and the graph in the "Your footprint" section of the website.

21. For your household, which category (travel, home, etc.) produced the *most* carbon emissions?

22. Which item or action contributed the most to the category you chose above? (For example, if "home" was the category that produced the most carbon emissions, electricity or natural gas usage may have contributed the most.)

23. For your household, which category (travel, home, etc.) produced the *least* carbon emissions?

24. Choose one action from Table 2, and explain why you chose that action. How much of an impact would this action have on your household's carbon footprint and on your lifestyle?

Table 3. The carbon footprint for the average U.S. household, measured as CO_2 emissions (tons CO_2/year), estimated by the CoolClimate Network website in 2020.

	Total **travel**	Total **home**	Total **food**	Total **shopping**	Total **footprint** *before* **reductions**
U.S. average carbon footprint	15.6	12.2	7.0	15.0	49.8

25. How does the carbon footprint for your household (Table 1) compare to the average carbon footprint (Table 3)?

26. According to the U.S. Census Bureau, the United States had 128,579,000 households as of 2019. If all of these households reduced their carbon footprint by the same amount that you proposed in Question 20, how many tons of CO_2 per year would we avoid putting into the atmosphere? Show your calculations.