

# ScienceNews

## Activity Guide for Students: Starting Small to Curb Climate Change

### Directions:

According to the article "[What lifestyle changes will shrink your carbon footprint the most?](#)" 58 percent of U.S. residents surveyed in 2017 were "concerned" or "alarmed" about global warming. Carbon dioxide and other emissions due to human activities are causing temperatures to rise. While many people are interested in reducing their carbon footprints, it's not always clear how to accomplish this or what real difference individual changes will make.

In this activity, you are going to identify and compare the lifestyle choices that affect the carbon footprints of individuals, households and communities. You will calculate your household's carbon footprint and determine ways it could be reduced. Then, you and your group will identify reasonable ways your community can reduce its carbon footprint and formulate an action plan for communicating and implementing these changes.

If you are doing this activity virtually, be sure to follow your teacher's instructions for getting set up to discuss and share data.

### Understanding the issue

After reading the article "[What lifestyle changes will shrink your carbon footprint the most?](#)" discuss with your group the lifestyle choices that affect an individual's carbon footprint, as well as the footprint of a household and community. How do those factors compare in terms of their scale of emissions?

The following questions will help your group work together to interpret the graphics in the article.

1. The graphics show how lifestyle choices can affect carbon dioxide emissions. What is meant by "carbon dioxide equivalent"?
2. What do the green circles represent in the graphics?
3. In the transportation graphic, which replacement for a 25 mpg car results in the greatest emissions savings? How many tons of carbon dioxide equivalent emissions per year are saved by making this change?
4. Compare the green circles for carpooling and taking the bus. Which circle represents a greater savings of carbon dioxide equivalent emissions?

5. According to the graphic, what is the round trip distance from home to work used in the carpooling calculation?

6. How many miles of driving alone does carpooling twice a week save, according to the graphic? How many 25-mile bus rides would cover the same distance?

7. Based on your answers from question 6, which saves more carbon dioxide equivalent emissions: carpooling twice a week or the equivalent distance in bus rides?

8. When assessing the impact of individual actions, why is it important to be able to read and interpret data correctly?

9. Look over the graphics for emissions related to shelter and food. As a group, decide what changes might have the largest impact on emissions. Remember to review the graphics carefully to ensure you are interpreting them correctly.

### **Your carbon footprint**

After your group discussion, use the Environmental Protection Agency's online carbon footprint calculator (<https://www3.epa.gov/carbon-footprint-calculator/>) to determine your household's carbon footprint, then answer the following questions on your own. You may have to ask an adult to help you make some of the estimates, such as the monthly bills. Start by determining what your current household's footprint is currently, without entering any changes.

10. What are your household's current emissions from home energy per year?

11. Which energy source was the highest contributor to that total? What is this energy source used for?

12. What are your household's current emissions from transportation per year?

13. What is your household's current emissions from waste before recycling per year? How many pounds of emissions does your family save per year by recycling?

14. What is your household's current emissions from waste after recycling per year?

15. What is your household's current total carbon footprint per year? According to the calculator, is this number higher, lower or the same as the U.S. average for a household of your size in your area?

16. In the article, Kim Cobb says she started reducing her carbon footprint by making small changes. Do you think making small changes in your household could make a difference? Why or why not?

17. According to the article, Kim Cobb changed her diet and amount of air travel. Why do you think these are not a part of the EPA's calculation?

18. Go back to the Home Energy tab on the calculator and look at the ways the EPA suggests you can reduce your household's carbon footprint from home energy use. Choose one of these suggestions that you think would make sense for your household and type in the adjustments to the calculator to adjust your footprint accordingly.

What could you change? How many pounds of carbon dioxide equivalent emissions would you save per year?

19. Why does this change make sense for your household? Does this change seem like it would be easy and affordable for your household to make?

20. Go back to the Transportation tab on the calculator and notice that the EPA suggests you can reduce your household's carbon footprint by reducing the number of miles each vehicle drives.

Is there one way your household could reduce the number of miles driven on a regular basis? Does this change seem like it would be easy and affordable for your household to make?

21. How many miles could this change save your household each year? How many pounds of carbon dioxide equivalent emissions per year would your household save?

22. Go back to the Waste tab on the calculator and look at any other materials your household could recycle. Choose one or more of these suggestions that you think would make sense for your household and type in the adjustments to the calculator to adjust your footprint accordingly.

What could you change? How many pounds of carbon dioxide equivalent emissions would you save?

23. Does this change seem like it would be easy and affordable for your household to make?

24. If your household were to make all of the changes you listed, how many total pounds of carbon dioxide equivalent emissions would your household save yearly?

25. If every household on your street or in your apartment building were able to make these same changes, how many pounds of carbon dioxide equivalent emissions would you save collectively?

26. How does this amount saved compare with the U.S. average for households of your size in your area?

You will now turn in your carbon footprint and emissions savings data to your teacher.

### **Community reduction plan**

Your teacher will provide you with your class's carbon footprint data, as well as data on proposed lifestyle changes and emissions savings. Discuss the results with your group, including the ways you think households could reduce their carbon footprints and what made these changes easy and affordable. Be sure to review the data on how much carbon dioxide equivalent emissions could be lowered if all of the households in the same apartment building or on the same street made the same changes.

Once your group has reviewed the data, you will create a plan for how your community could reduce its carbon footprint. Your plan will need to clearly outline the reasons why your changes will help reduce the community's carbon footprint and why this is beneficial. It is important to remember that people like to know the benefits of changes before making them. You may want to research how carbon dioxide and other emissions affect global warming, what effects global warming has on the planet and how reducing our carbon footprints can help reduce global warming. Brainstorm reasons why these changes have other benefits for the community as well, such as decreasing garbage overflow that leads to litter in the park, or

increasing exercise or socialization for citizens. Lastly, you will need to describe your plan for how to communicate and implement these changes.

The following questions will help your team brainstorm your plans for lowering the community's carbon footprint.

27. Everyone in your class selected different changes for their households. Which of the changes seemed to be the easiest to make? Why?

28. Which of the changes were the most affordable? Why?

29. Which of the changes made the largest impact?

30. Based on the data and your answers to questions 27 through 29, what are three changes your group thinks your community could make that would be easiest and most affordable, while making the biggest impact?

31. Will your changes require your community to provide any additional products or services (such as recycling receptacles or recycling pickup in residential areas)? What products or services will the individual households be responsible for?

32. What are the benefits of your plan for the planet?

33. In the article, Kim Cobb mentions that the changes she made also had a positive impact on her physical and mental well-being. Consider your changes. What personal benefits could each change have for members of the community?

34. According to the article, "social influence can drive change." What three actions could your group take to help inspire your community to take action?

35. How will you communicate your plan to the community? What information will you include in your communication?

36. Why might some changes that work in your household not work elsewhere in your community?

37. What are some reasons your plan may not work in every community globally?

### **Bonus activity**

As a bonus activity, consider the effects that large-scale events such as pandemics, volcanic eruptions, large wildfires or wars can have on carbon dioxide and other greenhouse gas emissions. You can find data online about emissions during these types of events, as well as satellite images that show how the [2019–2020 Australian Wildfires](#) and the COVID-19 pandemic affected emissions (including in [Europe](#), [China](#) and the [United States](#)). Be sure to consider how emissions patterns changed before, during and after these events, as well as how the results can affect neighboring countries and the world. Be sure to consider the trade-offs of reduced or increased emissions. For instance, while emissions appear to have decreased during the early stages of the COVID-19 pandemic, the amount of medical waste increased and the loss of life was tremendous.