

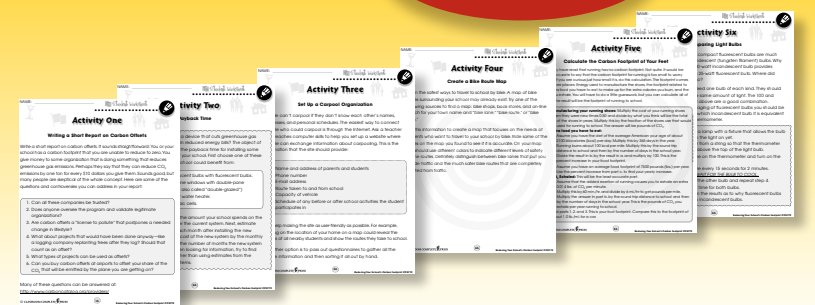
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# Your School and Climate Change

1. Circle the word **TRUE** if the statement is TRUE or Circle the word **FALSE** if it is FALSE.

- a) The planet Earth is getting warmer.  
**TRUE      FALSE**
- b) Greenhouses are filled with greenhouse gas.  
**TRUE      FALSE**
- c) Most carbon dioxide in the atmosphere came from plants.  
**TRUE      FALSE**
- d) Natural gas is a fossil fuel.  
**TRUE      FALSE**
- e) Carpooling helps slow the rate of climate change.  
**TRUE      FALSE**
- f) Burning coal puts more oxygen in the atmosphere.  
**TRUE      FALSE**

2. Put a check mark (✓) next to the answer that is most correct.

- a) Which of these fuels is a fossil fuel?
- A coal
  - B ethanol
  - C hydrogen
  - D wood
- b) Why has Earth's climate changed more over the last 100 years than during earlier periods?
- A The icecaps melted.
  - B More fuel was burned.
  - C More trees were planted.
  - D The ozone layer developed a hole.
- c) Which is true about the release of carbon dioxide (CO<sub>2</sub>) into the atmosphere?
- A Most CO<sub>2</sub> is released by people in the poorest countries.
  - B Everyone in the world releases the same amount of CO<sub>2</sub>.
  - C The average American releases more CO<sub>2</sub> than most people.
  - D The amount of CO<sub>2</sub> released depends mostly on the number of farm animals.



# Your School and Climate Change

The climate of our planet is changing. This is a fact, not an opinion. The part of **climate change** that is of most concern is a steady rise in average **global** temperature. It is nearly certain that this change is being caused by human activities.



Coal, Oil, Natural Gas

Certain gases in Earth's **atmosphere** trap heat and prevent it from escaping into space. These gases, called **greenhouse gases**, have the same effect as the glass windows of a greenhouse. Without the windows, a greenhouse would be too cold to grow plants in the winter; and without greenhouse gases, Earth would be too cold to support life.

The problem is that this warming effect has been increasing because the amount of greenhouse gases in the atmosphere has been increasing. Rise in the level of the gas called **carbon dioxide, CO<sub>2</sub>**, is the main cause of rising global temperature.

**STOP READING**

Explain how greenhouse gases affect Earth's climate.

\_\_\_\_\_

\_\_\_\_\_

Here is where we come into the picture. Rapidly increasing human population consumes ever more energy, and most of this energy comes



# Your School and Climate Change

1. Fill in each blank with a word from the list.

- |            |             |                |                  |
|------------|-------------|----------------|------------------|
| atmosphere | carpooling  | fossil fuels   | carbon footprint |
| oil        | natural gas | carbon dioxide | coal             |

Earth is getting warmer because people are releasing more and more (a) \_\_\_\_\_ into the (b) \_\_\_\_\_. Most of this release is caused by burning (c) \_\_\_\_\_, which include (d) \_\_\_\_\_, (e) \_\_\_\_\_, and (f) \_\_\_\_\_. The amount of greenhouse gases that result from a person's activities is called their (g) \_\_\_\_\_. One way to reduce this number is by (h) \_\_\_\_\_ with other people traveling to the same location.

2. Circle the word **TRUE** if the statement is TRUE or Circle the word **FALSE** if it is FALSE.

- a) Carbon dioxide is a greenhouse gas.  
**TRUE      FALSE**
- b) It is too soon to tell for sure whether or not Earth is getting warmer.  
**TRUE      FALSE**
- c) Carpool is a wrist injury caused by typing at a computer for many hours every day.  
**TRUE      FALSE**
- d) A carbon footprint can be removed by rubbing it with gasoline.  
**TRUE      FALSE**
- e) Burning fossil fuels releases greenhouse gases.  
**TRUE      FALSE**
- f) If we all stopped driving our cars today, Earth would be cooler tomorrow.  
**TRUE      FALSE**

# Your School and Climate Change

3. Answer the questions in complete sentences.

- a) Explain what the glass roof of a greenhouse and carbon dioxide in Earth's atmosphere have in common in terms of heat and temperature.

\_\_\_\_\_

\_\_\_\_\_

- b) Define "carbon footprint" and give the units in which it is measured.

\_\_\_\_\_

\_\_\_\_\_

### Extensions & Applications

Identify three fossil fuels. For each fuel, describe a use for that fuel that you have seen in your home, school, or town, or explain how the use affects your life or makes your life more convenient.

1. Fuel: \_\_\_\_\_  
Description of use: \_\_\_\_\_
2. Fuel: \_\_\_\_\_  
Description of use: \_\_\_\_\_
3. Fuel: \_\_\_\_\_  
Description of use: \_\_\_\_\_





# Carbon Footprint Calculator

On this and the following page you can calculate your school's carbon footprint. The different parts of your footprint are arranged in the same order as in the chapters of this book. The calculations will be done in pounds per year (lbs./yr.) of CO<sub>2</sub> and then converted to tons/yr. One ton = 2000 lbs. If you don't understand how to do the math, be sure to ask for help.

For each of the four parts of your school footprint, you will have to collect some information. Some of the numbers you will need may take some time to collect and record. This is why it is a good idea to work in groups and share the leg work. Suggestions for how to find information are given under the heading of each part of the footprint.

### Energy

Your school probably uses electricity and one type of fuel. You will need to find the amount of each kind of energy used by the school for the entire school year. These numbers appear on the school's energy bills. Ask your teacher or principal where you can see these records. They might also be found in the school's annual budget. The numbers you are looking for are **kilowatt-hours** (kWh) of electricity, **therms** or 100 cubic feet (100 ft<sup>3</sup>) of gas, gallons of oil, and tons of coal. Multiplying each of these times the number in the equation will change energy units/yr. to lbs. of CO<sub>2</sub>/yr. If all you can find are monthly bills, you will have to multiply the amount for an average month by the number of months in the school year (probably 9).

**Electricity:** ( \_\_\_\_\_ kWh/yr.) × (1.75) = \_\_\_\_\_ lbs. CO<sub>2</sub> / yr.

**Gas:** ( \_\_\_\_\_ therms, gal. or 100 ft<sup>3</sup>/yr.) × (11) = \_\_\_\_\_ lbs. CO<sub>2</sub> / yr.

**Oil:** ( \_\_\_\_\_ gal./yr.) × (24) = \_\_\_\_\_ lbs. CO<sub>2</sub> / yr.

**Coal:** ( \_\_\_\_\_ tons/yr.) × (5,000) = \_\_\_\_\_ lbs. CO<sub>2</sub> / yr.

**Total emissions due to school energy use:** \_\_\_\_\_ pounds/year

\_\_\_\_\_ lbs./yr. = \_\_\_\_\_ tons/yr.  
2000

### Transportation

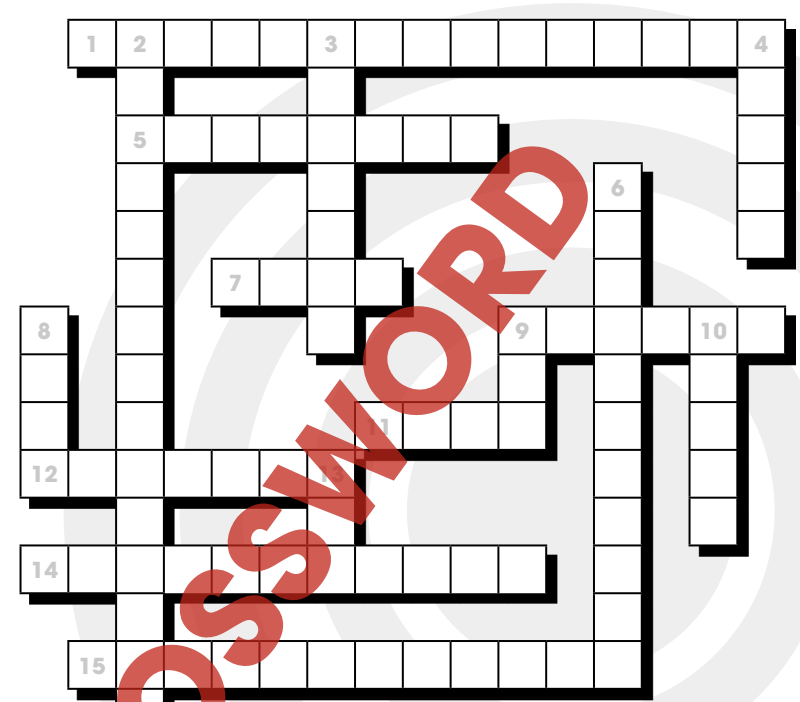
First find the number of days in the school year and the average daily attendance (how many show up—not how many are supposed to show up). Next do a survey of about 50 students chosen so they are scattered evenly throughout the school. For example, you could leave a survey form at every tenth locker, but don't choose the first 50 students getting off buses. The questions will be: how do you get to school? How many total miles do you travel each day on your way to and from school? If you carpool, how many students are in your carpool? Record your results in a table with these headings:



# Crossword Puzzle!

### Across

- The tons of carbon dioxide emissions caused by your activities.
- What CO<sub>2</sub> is to the photosynthesis process.
- EPA Energy \_\_\_\_\_ Rating.
- All over the Earth.
- Compounds that enter the atmosphere when paint is sprayed. (abbreviation)
- Rising temperature is one example of global \_\_\_\_\_ change.
- Circulating air in a building.
- Energy inefficient light bulbs with a tungsten filament.



### Down

- It cools the inside of a building on a hot day.
- Coal, oil, and \_\_\_\_\_ gas.
- The unit for measuring the amount of natural gas used.
- The energy efficient kind of light bulbs.
- The system that heats, cools, and circulates air in a building. (abbreviation)
- Coal, oil, and natural \_\_\_\_\_.
- If Earth's climate changes slowly enough, we will be able to \_\_\_\_\_ to it.
- The government agency that worries about the environment. (abbreviation)

### Word List

carbon footprint	fluorescent	climate
air conditioning	star	EPA
natural	HVAC	ventilation
therm	global	incandescent
reactant	adapt	
gas	VOCs	



# Comprehension Quiz

### Part A

Circle the word **TRUE** if the statement is TRUE or Circle the word **FALSE** if it is FALSE.

- Oil is a fossil fuel.  
**TRUE**      **FALSE**
- Oxygen is a greenhouse gas.  
**TRUE**      **FALSE**
- Your share of the CO<sub>2</sub> emitted into the atmosphere is called your carbon offset.  
**TRUE**      **FALSE**
- Energy Star is a brand of light bulbs.  
**TRUE**      **FALSE**
- Photovoltaic cells heat water.  
**TRUE**      **FALSE**
- It is possible for a school bus to emit CO<sub>2</sub> even when it is not moving.  
**TRUE**      **FALSE**
- A bicycle has a much smaller carbon footprint than that of a school bus.  
**TRUE**      **FALSE**

### Part B

Put a check mark (✓) next to the answer that is most correct.

- Carbon footprints are usually expressed in units of
  - A tons per year.
  - B miles per hour.
  - C therms per week.
  - D kilowatt-hours per month.
- The government agency concerned with climate change issues is the
  - A AARP.
  - B EPA.
  - C HVAC.
  - D VOC.
- Which of these is the term for an efficient type of light bulb?
  - A fluorescent
  - B incandescent
  - C photosynthetic
  - D photovoltaic

# Lower Your School's Carbon Footprint Outside Initiatives

STOP IDLING  
No idling while dropping off or picking up

Install Bike Racks & Bike Lanes

School

Plant Trees

Compost & Recycle as much as you can

Plant a School Garden

Install Photovoltaic Cells on your School's Roof

NAME: \_\_\_\_\_

After You Read 



# Your School and Climate Change

### 3. Answer the questions in complete sentences.

a) Explain what the glass roof of a greenhouse and carbon dioxide in Earth's atmosphere have in common in terms of heat and temperature.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

b) Define "carbon footprint" and give the units in which it is measured.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Extensions & Applications

Identify three fossil fuels. For each fuel, describe a use for that fuel that you have seen in your home, school, or town, or explain how the use affects your life or makes your life more convenient.

1. Fuel: \_\_\_\_\_

Description of use: \_\_\_\_\_

2. Fuel: \_\_\_\_\_

Description of use: \_\_\_\_\_

3. Fuel: \_\_\_\_\_

Description of use: \_\_\_\_\_

3.

a) (Answers will vary.) Both greenhouse glass and greenhouse gases trap heat and raise temperature.

b) (Answers will vary.) The carbon footprint is the amount of CO<sub>2</sub> emitted into the atmosphere caused by the activities of one person or group of people. It is measured in tons per year.

### Extensions & Applications

(Answers will vary.)

1. Coal is used to generate the electricity people use in their homes.

2. Oil is used to make the gasoline people use in their cars.

3. Natural gas is used to fuel kitchen stoves and ovens.



EASY MARKING ANSWER KEY