

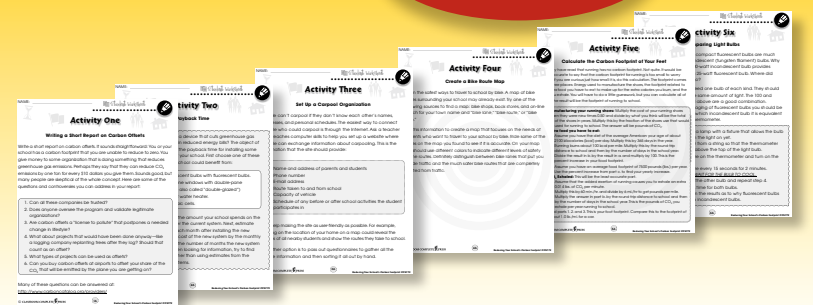
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Cars, Buses, Bicycles, and Feet

1. Complete each sentence with a word from the list.

efficient car carbon safer lanes idling

- a) The least energy efficient way to get to school is if you travel as the only student in a _____.
- b) Walking to school adds almost nothing to your _____ footprint.
- c) Travel by bus and by train are about equally _____.
- d) Walking is _____ than biking.
- e) Biking is safer when there are bike _____.
- f) Cars and buses waste energy when they are _____.

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

- a) Which of these ways of getting to school adds the least to your carbon footprint?
 - A bus
 - B car
 - C run
 - D train
- b) Which of these ways of getting to school adds much more to your carbon footprint than any of the other three?
 - A bike
 - B bus
 - C run
 - D walk
- c) An idling car is one that is
 - A speeding up.
 - B coasting downhill.
 - C overloaded with passengers.
 - D parked with its engine running.



Cars, Buses, Bicycles, and Feet

Students spend a lot of time and energy getting to school.

The amount of greenhouse gas emitted along the way can range from zero to many pounds of CO₂, depending on how you get there. Here are the most common possibilities: car, **carpool**, school bus, public transport, bicycle, walk, run.



An Energy Efficient School Bus

A single student and a driver in a car adds more CO₂ to the school's carbon footprint than any of the other ways of getting to school. Sharing a ride to school, which is called carpooling, can cause a big reduction in the carbon footprint of the school. The instructions for the school footprint calculator will show you how to adjust for carpooling.

You might want to think about starting a program to increase carpooling. This is what some students at a school in New Zealand did. For their carpooling project, they created a website where students and their drivers could log on to arrange shared rides among people who traveled the same route to school.

A school bus is about four times as efficient as a car in terms of how much CO₂ it adds to the footprint. Another way to look at it is that four students sharing a car are being about as efficient as students



Cars, Buses, Bicycles, and Feet

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

- a) Taking a train to school is about as energy efficient as
 - A biking.
 - B running.
 - C being driven in a car.
 - D riding in a school bus.
- b) All of these ways of getting to school add almost nothing to your carbon footprint, **except**
 - A biking.
 - B carpooling.
 - C running.
 - D walking.
- c) Schools can reduce their transportation carbon footprint by
 - A creating no-idle zones.
 - B assigning less homework.
 - C expanding the parking lot.
 - D using smaller school buses.

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

- a) Carpooling with three other students is about as energy efficient as riding in a school bus.

TRUE FALSE
- b) Trains, trolleys, and other public transport are much more energy efficient than school buses.

TRUE FALSE
- c) Bike lanes make travel by bicycle safer.

TRUE FALSE
- d) Idling means sharing a ride in a car.

TRUE FALSE
- e) Electric cars and buses have no carbon footprint.

TRUE FALSE

Cars, Buses, Bicycles, and Feet

3. Answer the questions in complete sentences.

- a) Explain how you could make biking to your school safer.

- b) Describe an "idle-free zone" and explain how it would reduce a school's carbon footprint.

Extensions & Applications

Estimate how many students travel to and from your school by each of these means of transportation.

- Car single passenger _____
- 2 student carpool _____
- 3 student carpool _____
- 4 student carpool _____
- School bus _____
- Public transportation _____
- Bike _____
- Walk _____
- Run _____

Based on these numbers and what you know about your fellow students, what are the most likely ways these numbers could change to reduce your school's transportation carbon footprint?



Calculating Your School's New, Improved Carbon Footprint

Look at each of these possibilities for reducing your school's carbon footprint. Some require money, personal inconvenience, or change of lifestyle. In each case, decide whether students, teachers, and parents would be likely to accept the changes. If it seems likely, do the calculation and record the footprint reduction. Under each heading, changes are arranged roughly in order of expense and difficulty.

Energy Reduction

Replace tungsten bulbs with compact fluorescents for a reduction of 1.0 lb. of CO₂ per Watt replaced. Add up the wattage of all the bulbs you could replace and write the total here: _____ lbs. of CO₂/yr.

Look for EPA Energy Star ratings on all appliances, electronic equipment, and the HVAC system. Estimate how much of the school's energy footprint, in lbs./yr., is due to this equipment. Multiply that amount by 0.25 to find the reduction for replacing this equipment with Energy Star equipment and write the answer here: _____ lbs. of CO₂/yr.

Estimate how much of the energy footprint goes to heating and air conditioning. If the school does not have double-pane windows, multiply that amount by 0.15 to find the reduction for installing double-pane windows and write the answer here: _____ lbs. of CO₂/yr.

If your school has no insulation the reduction for installing it is the same as for double pane windows: _____ lbs. of CO₂/yr.

Install solar hot water collectors. If you cannot estimate the part of the energy footprint used to heat water, multiply the total energy footprint by 0.20 and write the answer here: _____ lbs. of CO₂/yr.

Reduction for generating all the school's electricity with photovoltaic cells. Write the number you calculated for electricity on page 14: _____ lbs. of CO₂/yr.

Energy Footprint Reduction: Add up the energy reductions, divide by 2000, and write the answer here: _____ tons of CO₂/yr.

Transportation Reduction

Gather the following numbers (some you will have to estimate):

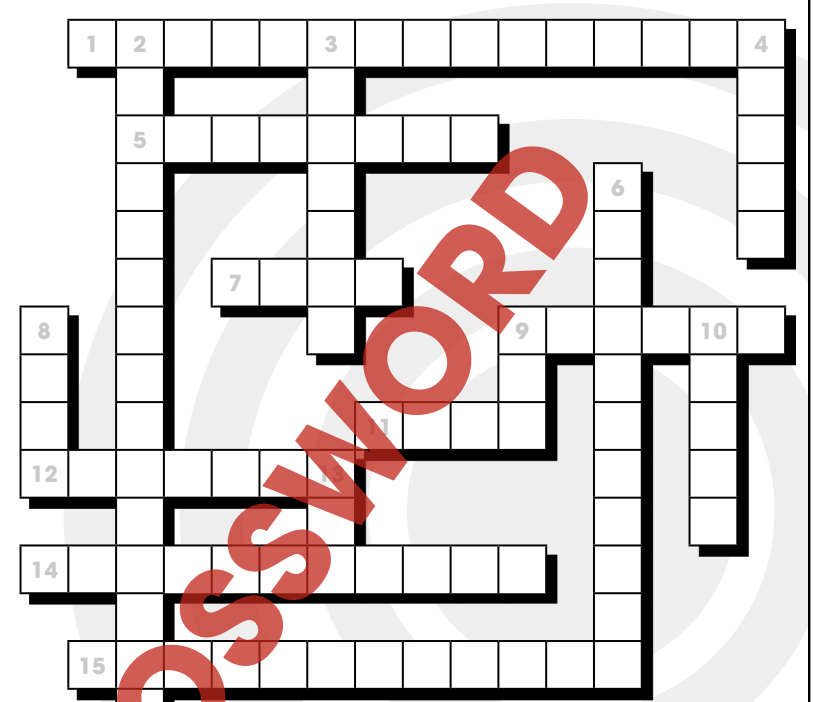
- Average distance ridden by students traveling to school by car: _____ mi.
- Average distance ridden by students traveling to school by bus: _____ mi.
- Days in school year: _____
- Number of single riders who will agree to carpool: _____
- Average number in carpool: _____
- Number of students who will switch from car to bus: _____
- Number of students who will switch from car to walking: _____
- Number of students who will switch from bus to walking: _____



Crossword Puzzle!

Across

- The tons of carbon dioxide emissions caused by your activities.
- What CO₂ 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 therm	HVAC	ventilation
reactant	global	incandescent
gas	adapt	
	VOCs	



Comprehension Quiz

25

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 CO₂ 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 CO₂ 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

Green School Charter

Travel wisely by...

- Design activities to promote walking and cycling
- Use public transportation
- Organize a carshare or carpool

Reduce Waste by...

- Reduce paper use
- Eliminate bottled water
- Bring only zero-waste lunch
- Repair rather than disposing
- Compost

Save Energy by...

- Shut off lights and faucets
- Put computers to sleep
- Use water wisely
- Close doors and windows
- Buy equipment that is energy efficient
- Become a solar school

Care for your school yard by...

- Harvest storm water
- Plant trees
- Grow a garden

NAME: _____

After You Read 



Cars, Buses, Bicycles, and Feet

3. Answer the questions in complete sentences.

a) Explain how you could make biking to your school safer.

b) Describe an "idle-free zone" and explain how it would reduce a school's carbon footprint.

Extensions & Applications

Estimate how many students travel to and from your school by each of these means of transportation.

Car single passenger _____

2 student carpool _____

3 student carpool _____

4 student carpool _____

School bus _____

Public transportation _____

Bike _____

Walk _____

Run _____

EASY MARKING

Based on these numbers and what you know about your fellow students, what are the most likely ways these numbers could change to reduce your school's transportation carbon footprint?

3.

(Answers will vary.) Get a map of bike lanes and find a route that has all bike lanes.

(Answers will vary.) Vehicles must turn off their engines in an idle free zone. When engines idle they emit CO₂ even though they aren't moving.

Extensions & Applications

Answers will vary widely from school to school. There are no correct answers for this application.



ANSWER KEY