



TEACHER GUIDE

• Assessment Rubric	4
• How Is Our Resource Organized?	5
• Bloom's Taxonomy for Reading Comprehension	6
• Vocabulary.....	6



STUDENT HANDOUTS READING COMPREHENSION

• Your School and Climate Change.....	
• How Your School Uses Energy	
• Cars, Buses, Bicycles, and Feet.....	
• Footprints in Your Lunch	
• We Recycle Cans, Trees Recycle Carbon.....	7
• Study Green	
• Reduce What You Can and Offset the Rest	
• Graphic Organizer	12
• Carbon Footprint Calculator	14
• Calculating Your School's New, Improved Carbon Footprint.....	16
• Crossword	18
• Word Search	19
• Comprehension Quiz	20



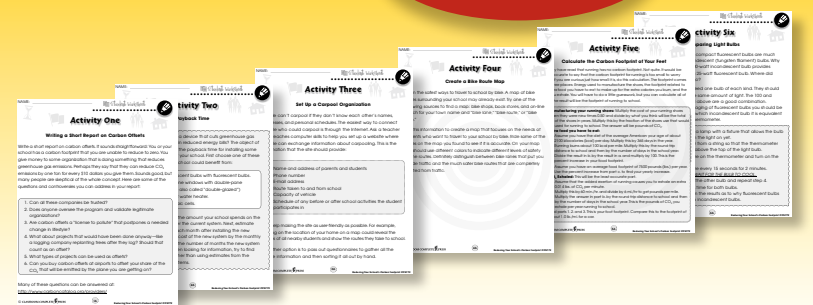
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We Recycle Cans, Trees Recycle Carbon

1. Circle the word **TRUE** if the statement is TRUE or Circle the word **FALSE** if it is FALSE.
- a) Paper is made from trees.
TRUE FALSE
 - b) Reusing reduces a carbon footprint more than recycling.
TRUE FALSE
 - c) Plants absorb oxygen from the atmosphere.
TRUE FALSE
 - d) Used paper should be burned in an incinerator.
TRUE FALSE
 - e) Glass can be recycled.
TRUE FALSE
 - f) Used computers should be taken to a landfill where they can be crushed.
TRUE FALSE

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

a) Which of these is a **product** of the photosynthesis reaction?

- A water
- B oxygen
- C chlorophyll
- D carbon dioxide

b) Which of these is a **reactant** in the photosynthesis reaction?

- A sugar
- B oxygen
- C chlorophyll
- D carbon dioxide

c) Which symbol means "recycle here"?

- A
- B
- C
- D



We Recycle Cans, Trees Recycle Carbon

It takes more than one billion trees to make all the paper thrown away every year in the United States. Wasting paper increases CO₂ in the atmosphere because making paper emits CO₂ and also because trees absorb CO₂. Schools can save a lot of paper by using both sides of sheets of paper for handouts, tests, and homework.



Photosynthesis

Students, teachers, and custodians can all share in the practice of recycling paper. More paper will be collected for recycling if paper recycling bins are located in each classroom and in other convenient locations throughout your school.

Labeled recycling containers for collecting glass bottles, aluminum cans, and plastic can be located in a group along with the paper recycling bin. It is important to recycle things made from any of these materials because they all require a lot of energy to manufacture and most of that energy comes from burning fossil fuels. Aluminum is especially important to recycle because large amounts of electricity are needed to make aluminum metal from aluminum ore. If your school is buying new computers, be sure to check for local second-hand stores and electronics stores that restore and recycle old computers.

Some school supplies and equipment cause less greenhouse gas emissions than others. For example, some products are made mostly



We Recycle Cans, Trees Recycle Carbon

1. Fill in each blank with a word or group of words from the list.

electricity agency carbon dioxide volatile environmental
organic protection electronics photovoltaic compounds

The manufacture of aluminum uses a lot of (a) _____.
VOC stands for (b) _____ (c) _____ (d) _____.
EPA stands for (e) _____ (f) _____ (g) _____.
Some (h) _____ stores will accept used computers. Wasting paper increases the amount of (i) _____ in the atmosphere. The process in plants that converts light energy to chemical energy is called (j) _____.

2. Circle the word **TRUE** if the statement is TRUE or Circle the word **FALSE** if it is FALSE.
- a) Every year, more than one billion trees are cut down to make the paper used in the United States.
TRUE FALSE
 - b) Used school papers should be shredded and sent to a landfill.
TRUE FALSE
 - c) School furniture finished with high VOC paint is better for the environment.
TRUE FALSE
 - d) Energy Star products have smaller carbon footprints.
TRUE FALSE
 - e) The products of photosynthesis are water and carbon dioxide.
TRUE FALSE
 - f) A tree absorbs about 20 pounds of CO₂ each year.
TRUE FALSE



We Recycle Cans, Trees Recycle Carbon

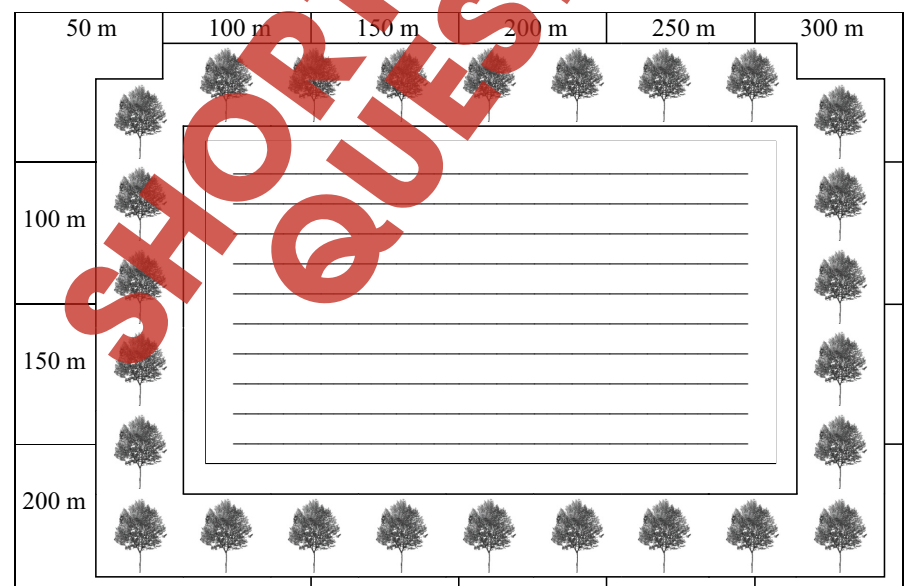
3. Answer the questions in complete sentences.

a) Describe two ways your school can reduce the amount of carbon dioxide emitted into the atmosphere.

b) Describe one way your school can remove carbon dioxide from the atmosphere.

Extensions & Applications

A school occupies a rectangular plot of land that is 300 meters by 200 meters. The students started a project to plant trees all the way around the edge of the property. If they plant a tree every 10 meters, how many pounds of CO₂ will the trees remove from the atmosphere when they are mature? Show your work and explain your calculations in the space below.





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 CO₂ 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 ft³) 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 CO₂/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. CO₂ / yr.

Gas: (_____ therms, gal. or 100 ft³/yr.) × (11) = _____ lbs. CO₂ / yr.

Oil: (_____ gal./yr.) × (24) = _____ lbs. CO₂ / yr.

Coal: (_____ tons/yr.) × (5,000) = _____ lbs. CO₂ / yr.

Total emissions due to school energy use: _____ pounds/year

_____ lbs./yr. = _____ tons/yr.
2000

Transportation

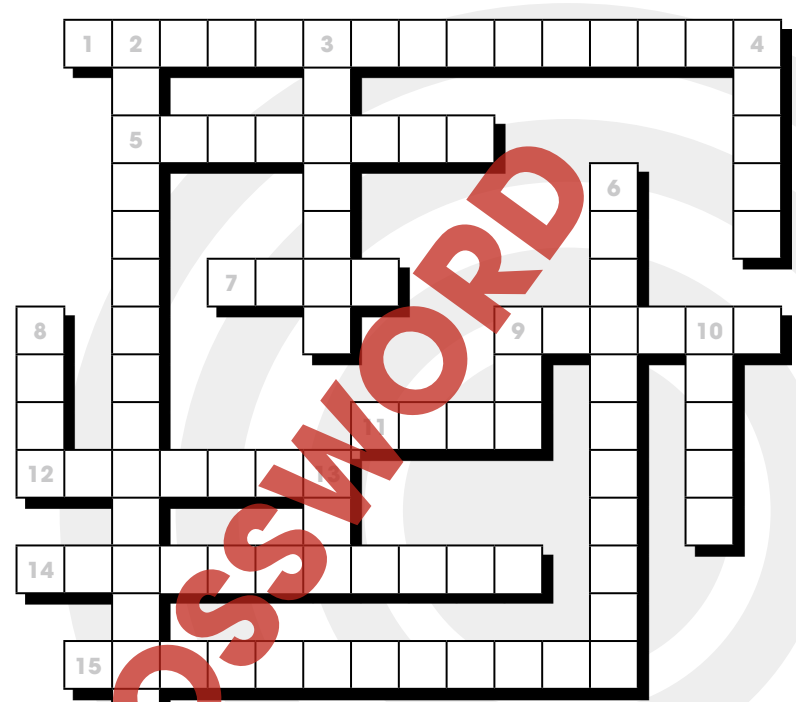
First find the number of days in the school year and the average daily attendance (how many show up—not how many are supposed to show up). Next do a survey of about 50 students chosen so they are scattered evenly throughout the school. For example, you could leave a survey form at every tenth locker, 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 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 gas	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 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

Lower Your School's Carbon Footprint Outside Initiatives

NAME: _____

After You Read 



We Recycle Cans, Trees Recycle Carbon

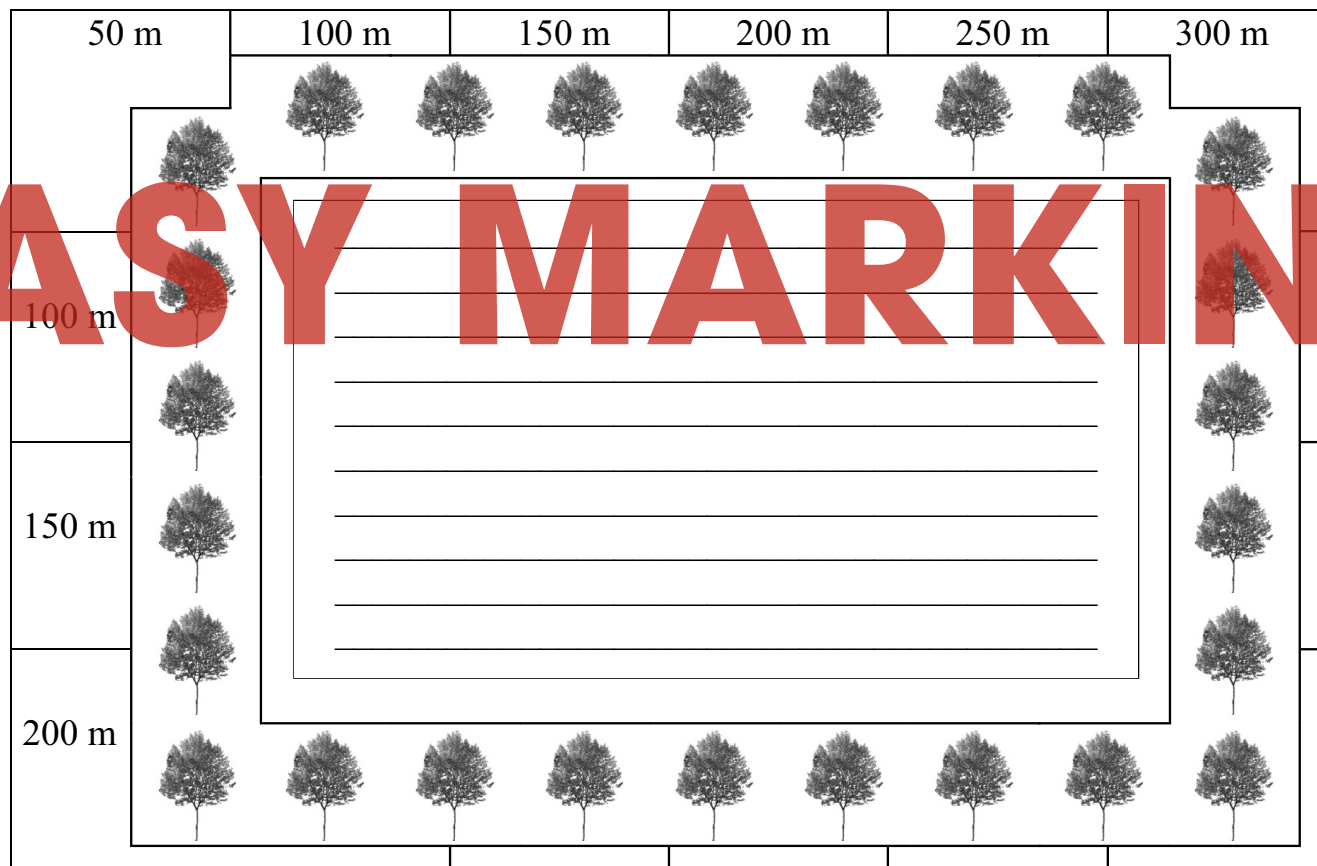
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3.

- a) (Answers will vary.) The school can recycle paper and it can compost food waste.
- b) (Answers will vary.) The school can plant trees on the school grounds.

Extensions & Applications

Total distance around the border of the school property = $(2 \times 200) + (2 \times 300) = 1000$ meters.

$$1000 \text{ m} \times \frac{1 \text{ tree}}{10 \text{ m}} \times \frac{20 \text{ lbs.}}{1 \text{ tree}} = 2000 \text{ lbs.} = 1 \text{ ton of CO}_2$$