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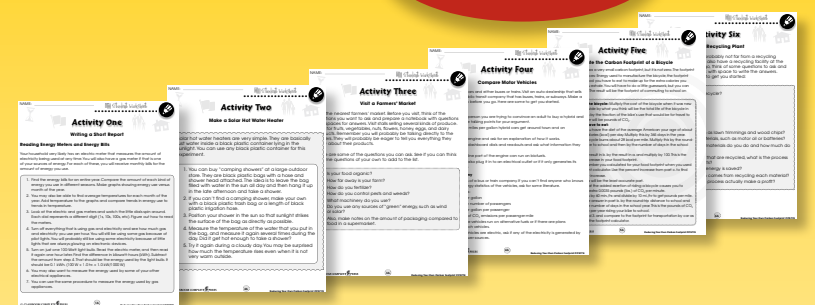
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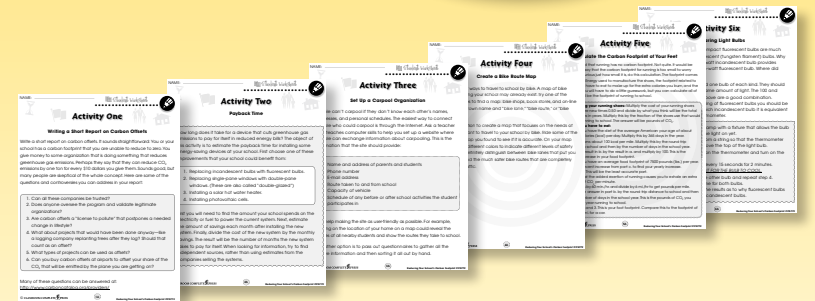
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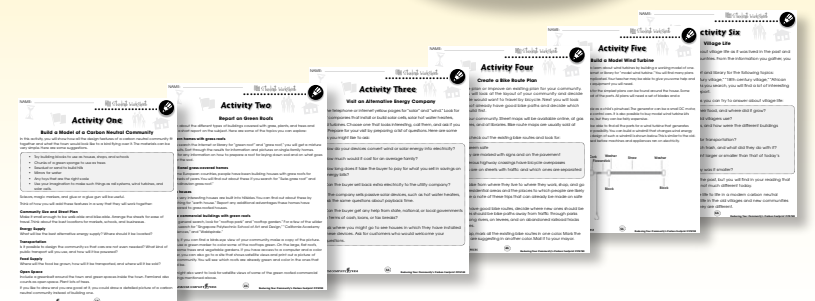
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Your Footprint At Home

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

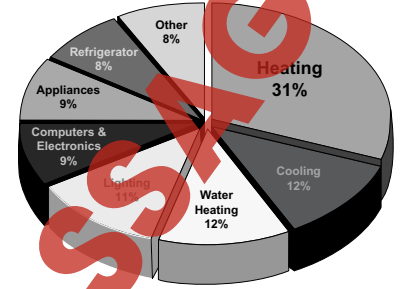
- a) Electrical appliances have a carbon footprint.
TRUE FALSE
- b) A heating oil bill shows how much oil you used.
TRUE FALSE
- c) An electric dryer is more energy efficient than a clothesline.
TRUE FALSE
- d) Modern appliances are usually less efficient than old ones.
TRUE FALSE
- e) Most factories have a carbon footprint.
TRUE FALSE

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

- a) An electricity bill shows how much energy you used in units of
 A volts
 B amps
 C electrons
 D kilowatt-hours
- b) What is the source of energy for most of the electricity generated in the United States?
 A solar cells
 B fossil fuels
 C hydroelectric dams
 D nuclear power plants
- c) All of these release CO₂ into the atmosphere, except
 A a gas stove
 B a solar cell
 C a diesel truck
 D a wood-burning fireplace

Your Footprint At Home

Think of all the things you have at home that use some kind of energy. All or most of that energy comes from the combustion of fossil fuels. So everything in your home that uses energy puts carbon dioxide into the atmosphere.



If you are thinking you will have to figure the carbon footprint of every appliance and electronic device, you can relax. It is much simpler than that. You probably use only two or three kinds of energy. Each kind of energy is sold to your household by an energy company. They keep careful records so they know how much to charge you. The amounts of each kind of energy are shown on the bill.

You will have to find copies of your energy bill to calculate the carbon footprint for your home. Electricity is measured in **kilowatt-hours (kWh)**, natural gas and other kinds of gas are measured in **therms** or hundreds of cubic feet, heating oil is measured in gallons, and coal and wood are measured in tons.

STOP Identify two forms of energy sold to home owners by power companies.

We have already seen that the combustion of coal, oil, and gas releases CO₂, but why is electricity part of the footprint? Most electricity is generated with energy produced by the combustion of fossil fuels, especially coal. But what if you live next to a power plant that doesn't use fossil fuels, like a

Your Footprint At Home

1. Write the name of each appliance beside the way to reduce its carbon footprint.

air conditioner light bulb clothes dryer hot water heater dishwasher cooking stove

- a) _____ keep lids on pots
- b) _____ use a clothesline
- c) _____ use only for full loads
- d) _____ use solar collector
- e) _____ set at a higher temperature
- f) _____ switch to fluorescent

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

- a) Most of the electricity used to operate appliances was generated using fossil fuels.
TRUE FALSE
- b) Photovoltaic cells convert wind power to electricity.
TRUE FALSE
- c) A shower uses less hot water than a bath.
TRUE FALSE
- d) Electricity is measured in kilograms.
TRUE FALSE
- e) The energy an appliance uses does not account for all of its footprint.
TRUE FALSE

Your Footprint At Home

3. Answer the questions in complete sentences.

- a) What information is needed to begin calculating the part of your home footprint caused by the energy your appliances use?

- b) Describe the steps in the calculation after you have gathered the information in part a).

Extensions & Applications

A typical modern kitchen is shown below.



This kitchen uses energy in at least eleven different ways, each of which adds to the carbon footprint. Try to identify seven ways the kitchen uses energy, write their names and draw arrows to the appliance or other feature that uses energy.

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	

After You Read NAME: _____

Comprehension Quiz

- Part A**
- Circle the word **TRUE** if the statement is TRUE or **FALSE** if it is FALSE.
- Global climate change is caused by a change in the amount of greenhouse gases in the atmosphere.
TRUE **FALSE**
 - Carbon dioxide is a greenhouse gas.
TRUE **FALSE**
 - Your community carbon footprint is the same as your personal carbon footprint.
TRUE **FALSE**
 - Adding parkland to your community increases its carbon footprint.
TRUE **FALSE**
 - Some communities generate all their own electricity from renewable sources.
TRUE **FALSE**
 - Carbon neutral communities are being built in countries around the world.
TRUE **FALSE**
 - People living on low-lying islands are looking forward to a rise in global temperature.
TRUE **FALSE**

- Part B**
- Put a check mark (✓) next to the answer that is most correct.
- Which invention was the main cause of cities and communities spreading out to cover more land?
 A television
 B cell phone
 C automobile
 D electric light
 - Which change in a community's food supply would reduce its carbon footprint?
 A Buying food from farmers closer to home.
 B Improving packaging to keep food fresh longer.
 C Using more chemical fertilizer to increase crop yield.
 D Buying more food than you need to be ready for natural disasters.
 - Cities absorb more solar energy than the surrounding countryside, creating a
 A heat island.
 B carbon offset.
 C sea level rise.
 D greenhouse effect.

Wind Turbine Capacity

400' (122 m) → 1,650 kW → With good wind, this turbine could generate enough electricity for 400-500 homes

200' (61 m) → 500 kW → With good wind, this turbine could generate enough electricity for 100-150 homes

100' (30 m) → 10 kW → With good wind, this turbine could generate enough electricity for 1 home

NAME: _____

Before You Read



Is the Future Green or Grim?



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

- a) When polar ice caps melt, sea levels drop.
TRUE FALSE
- b) Humans have no control over the amount of CO₂ in the atmosphere.
TRUE FALSE
- c) The food footprint of a community depends partly on where its food is grown.
TRUE FALSE
- d) Making bicycle travel safer can reduce the carbon footprint of a community.
TRUE FALSE
- e) Any community could use hydroelectric power as an alternative energy source.
TRUE FALSE
- f) If people speak out, it can change how governments act on climate change.
TRUE FALSE

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

a) If all communities suddenly became carbon neutral, global temperature would

- A slowly drop.
- B drop rapidly.
- C no longer change.
- D increase more slowly.

b) Which alternative power source would work best for most desert communities?

- A solar cells
- B wind turbines
- C geothermal power
- D hydroelectric power

c) If a community is carbon neutral, it means that it

- A does not use energy.
- B uses only natural gas as fuel.
- C absorbs as much CO₂ as it emits.
- D gets all its energy from electricity.

123

1.

a) FALSE

b) FALSE

c) TRUE

d) TRUE

e) FALSE

f) TRUE

2.

a) D

b) A

c) C

123

Global climate change had shortened the winter so much they had little use for them.

124

1.

a) TRUE

b) FALSE

c) FALSE

d) TRUE

e) TRUE

f) FALSE

2.

Natural gas, fossil fuels, better highways, rising sea level, and melting ice caps should be crossed out. Solar hot water, green roofs, photovoltaic cells, bike paths, wind turbines, recycling waste, and community gardens should be circled.

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3.

a) In a future where climate change is still a problem, low-lying islands like the Maldives may be under water.

b) In the grim future, the food was shipped from far away; and, in the green future, food was locally or home grown.

Extensions & Applications

1. (Answers will vary.) Look for government programs that help people reduce their home energy use, such as tax breaks for installing solar devices. Find ways to spread the news about this help.

2. (Answers will vary.) Support local farmers' markets. Join a group interested in home gardening and composting.

3. (Answers will vary.) Plant trees on your family's property. Volunteer to help plant trees on public land.

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Across

- 1. active
- 4. greenbelt
- 5. carpool
- 7. gas
- 9. organic
- 10. telecommuters
- 13. fossil
- 14. fuel
- 16. per capita
- 17. commuter

Down

- 1. alternative
- 2. cell
- 3. global
- 6. photovoltaic
- 8. solar
- 11. suburb
- 12. island
- 15. heat

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EASY MARKING ANSWER KEY