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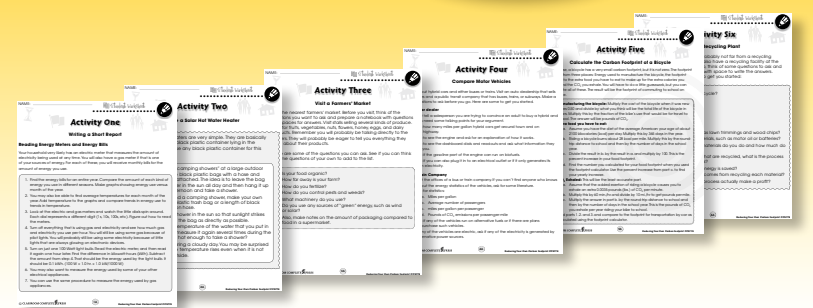
EASY MARKING™ ANSWER KEY 22

MINI POSTERS 24

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Your Travel Footprint

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

- a) Most vehicles add to the carbon footprint because they release oxygen.
TRUE FALSE
- b) Hybrid cars run on both gasoline and electricity.
TRUE FALSE
- c) People who work at home usually have smaller carbon footprints than people who commute to work.
TRUE FALSE
- d) A person running exhales about as much CO₂ as is emitted by a gasoline powered car.
TRUE FALSE
- e) Commuters can reduce their carbon footprints by carpooling.
TRUE FALSE

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

- a) Which means of transportation has the smallest carbon footprint?
 - A bicycle
 - B bus
 - C plane
 - D train
- b) Why do buses have a lower carbon footprint than cars?
 - A Buses make more stops.
 - B Buses carry more people.
 - C Buses travel at lower speeds.
 - D Buses have more powerful engines.
- c) Which type of driving results in the best fuel efficiency and the smallest carbon footprint?
 - A slow with many stops and starts
 - B fast and at a constant speed
 - C slow and at a constant speed
 - D fast with many stops and starts



Your Travel Footprint

Most people increase their carbon footprint when they travel because most vehicles emit CO₂ and other greenhouse gases. There are basically three ways to reduce your travel footprint: travel more efficiently, travel less, and travel under your own power.

First let's compare the efficiency of some different kinds of transportation. An average American car with one person in it emits a little over one pound of CO₂ per mile. Commercial aircrafts are about the same, based on pounds of CO₂ per passenger-mile (the miles flown divided by the number of passengers). The footprints of trains and buses are about half that size, but it varies a lot depending on how full they are.

So you can shrink your travel footprint by taking public transport, but there is a lot you can do to make driving a car more efficient too. The easiest way is to put more people in the car. If three people are in the car, each person's footprint is one-third as large (do the math). **Hybrids** are cars that are partly electric powered and partly gasoline powered. The electricity is generated and stored in batteries when the brakes are applied. Hybrids give off about one-half pound of CO₂ per mile. Also, some ordinary economy cars are just as efficient as hybrids.

Any car can be made more efficient by proper maintenance and driving habits. Regular tune-ups and proper tire inflation help. Reducing the weight by taking things out of the trunk that don't need to be there



Reduce your carbon foot print by traveling more efficiently and traveling less



Your Travel Footprint

1. The footprint of different ways of traveling is best compared by comparing how many pounds of CO₂ are emitted per passenger-mile. Match each means of travel to the approximate pounds of CO₂ emitted per passenger-mile (lbs./p-mi.). Some answers will be used more than once.

1.0 lb./p-mi ½ lb./p-mi ⅓ lb./p-mi almost 0 lb./p-mi

- _____ a) public bus
- _____ b) bicycle
- _____ c) passenger train
- _____ d) average car with one person in it
- _____ e) average car with two people in it
- _____ f) average car with three people in it
- _____ g) hybrid car with one person in it
- _____ h) commercial jetliner

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

- a) Commercial jets emit the least amount of CO₂ per person because they carry so many people.
TRUE FALSE
- b) Hybrid cars generate electricity as they come to a stop.
TRUE FALSE
- c) Telecommuters never work for big companies.
TRUE FALSE
- d) The footprint of bus passengers depends on how many people are on the bus.
TRUE FALSE
- e) Proper tire inflation affects the fuel efficiency of a car.
TRUE FALSE

Your Travel Footprint

3. A single person driving a car alone has one of the largest travel footprints. Describe two ways the footprint of transportation by automobile can be reduced.

- a) _____
- _____
- b) _____
- _____

Extensions & Applications

Trains, planes, and buses all have carbon footprints because they burn fossil fuels which emit CO₂. Each of these also has a secondary, indirect footprint caused by activity that makes travel by these vehicles possible. Choose two of these means of transportation and for each one describe three sources of a secondary footprint.

- a) First vehicle: _____
 - 1. _____
 - 2. _____
 - 3. _____
- b) Second vehicle: _____
 - 1. _____
 - 2. _____
 - 3. _____

Calculating Your New, Improved Carbon Footprint (continued)

Changing Your Travel Habits:

Replace travel by powered vehicles with travel under your own power. Use the formulas at the top of page 15 to estimate the reductions. _____ lbs./yr.

Convince the person who drives you to maintain their car better for a reduction of 6% of the result from the equation for car travel. _____ lbs./yr.

Convince someone in your household to telecommute (a reduction for them—not for you).

Convince the person who drives you around to buy a more fuel efficient car. Use the formula for car travel and change the miles per gallon figure to that of the car you hope they buy. _____ lbs./yr.

Total Travel Reductions: _____ lbs./yr.

Changes to Everything Else:

Buy fewer goods. Estimate the amount by which you expect to reduce your spending and multiply it by 6 to get reduced lbs. of CO₂. _____ lbs./yr.

Reduction due to composting: 240 lbs./yr. _____ lbs./yr.

Reductions for recycling: 140 lbs./yr. for cans, 40 for glass, 220 for paper, and 40 for plastic. _____ lbs./yr.

20 lbs. reduction for every tree you plan to plant. _____ lbs./yr.

Total Reduction for Everything Else: _____ lbs./yr.

Grand Total of All Reductions: _____ lbs./yr.

Divide the grand total by 2000 and write the answer here: _____ tons

Subtract from the Grand Total result from the footprint calculator and write your new carbon footprint here: _____ tons

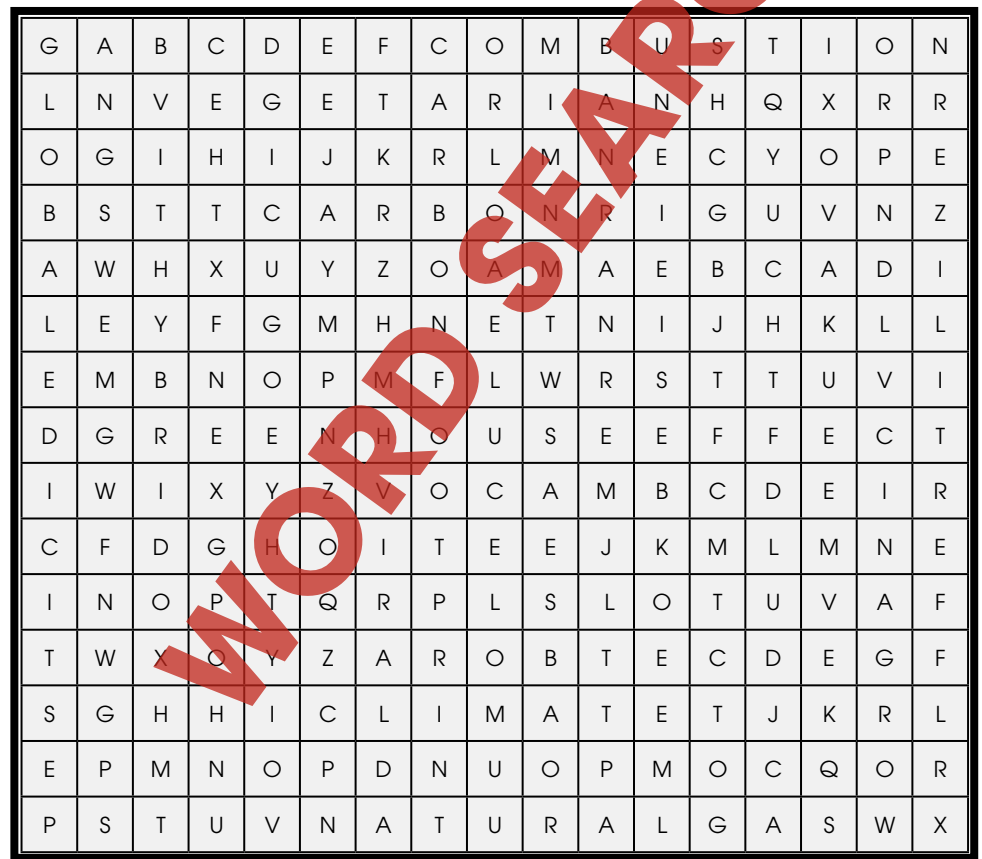
You may be wondering how accurate these footprint calculations were. Clearly this is not exact science. Many people have designed carbon footprint calculators, all based on different assumptions and guesses, and all of them give different answers. This calculator is a combination of other calculators. An attempt was made to match it to the lifestyle of an average American grade school or middle school student.

It is important to understand that comparisons of footprints are more dependable than the tons of CO₂ calculated. For example, the value of 19 tons for the average American footprint is much less certain than the statement that it is 4½ times the world average. Likewise, if you calculate that you can reduce your footprint by one-third, that is likely to be true, even if the size of your footprint is questionable. Look at it this way: An inaccurate bathroom scale can't tell you your true weight, but it can tell you that you lost 10% of your weight.

Word Search

Find all of the words in the Word Search. Words are written horizontally, vertically, diagonally, and some are even written backwards.

| | | | | |
|-------------------|-------------|------------------|---------------|--------------|
| combustion | climate | pesticide | organic | photovoltaic |
| vegetarian | compound | hybrid | fertilizer | oxygen |
| carbon | natural gas | carbon footprint | telecommuting | methane |
| greenhouse effect | global | molecule | therm | atom |



Comprehension Quiz

Part B

3. Which of these parts of your personal footprint is most difficult to reduce?

- _____ A the part caused by traveling
- _____ B the part caused by the food you eat
- _____ C the part caused by government activities
- _____ D the part caused by heating and cooling your home

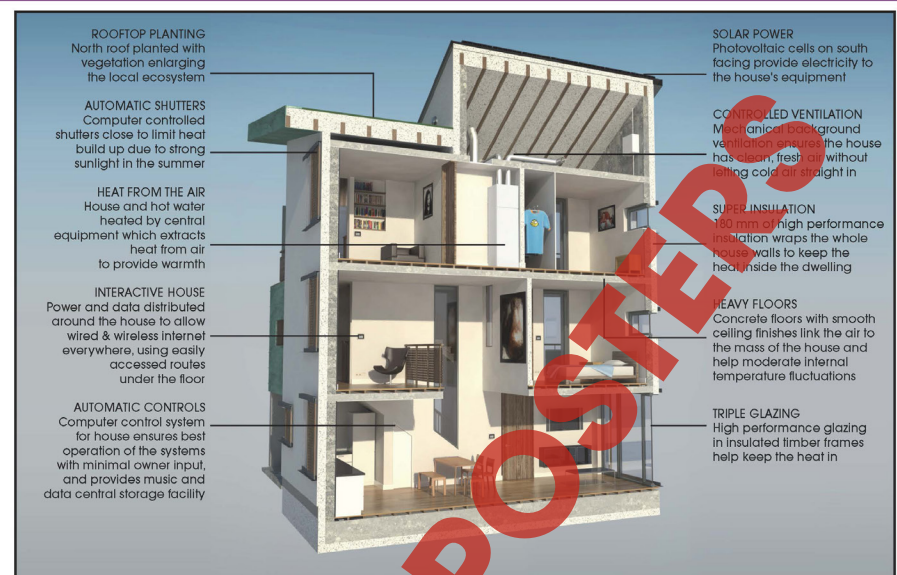
Part C

Answer each question in complete sentences.

- Explain how human activities are changing Earth's climate. 3
- Define carbon footprint. 3
- Explain why using electric appliances increases your carbon footprint. 3
- Tell four ways you can reduce the carbon footprint of the food you eat. 3
- Explain why bus passengers have lower travel footprints than car passengers, even though buses emit more CO₂ than cars. 3

SUBTOTAL: /15

Choose Eco Friendly Homes



Carbon Neutral Home



Eco Friendly Home

NAME: _____

After You Read 



Your Travel Footprint

3. A single person driving a car alone has one of the largest travel footprints. Describe two ways the footprint of transportation by automobile can be reduced.

- a) _____

- b) _____

Extensions & Applications

Trains, planes, and buses all have carbon footprints because they burn fossil fuels which emit CO₂. Each of these also has a secondary, indirect footprint caused by activity that makes travel by these vehicles possible. Choose two of these means of transportation and for each one describe three sources of a secondary footprint.

- a) First vehicle: _____
- _____
 - _____
 - _____
- b) Second vehicle: _____
- _____
 - _____
 - _____

3.

(Answers will vary.)
The footprint of an automobile can be reduced by (any two) carpooling, proper tire inflation, proper maintenance, driving at a low speed, driving at a constant speed, removing unnecessary weight.

Across

- molecule
- carbon
- carbon footprint
- telecommuting
- pesticides

Down

- carbon dioxide
- herbicide
- vegetarians
- carbon cycle
- climate
- fossil
- photovoltaic
- atom
- therm
- gas

Extensions & Applications

- (Answers will vary.)
- First vehicle: Train
 Energy to mine metals
- Energy to smelt steel for train cars and tracks
 - Energy to manufacture train
- Second vehicle: Plane
- Energy to refine aluminum
 - Energy to build airport
 - Energy to drive to airport
- Alternative answer: Bus
- Energy to mine metals
 - Energy to smelt steel
 - Energy to build highways

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EASY MARKING ANSWER KEY