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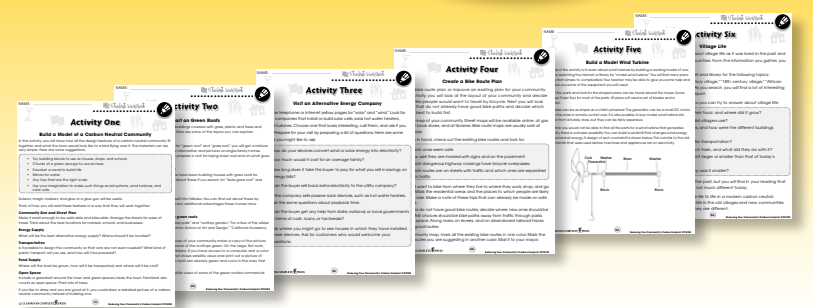
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# Greener Vegetables

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

pesticides carbon organic fossil locally shipping farmers'

The food a community eats adds to its (a) \_\_\_\_\_ footprint. How and where the food is grown can make a big difference in the footprint. Food that is grown without using chemical fertilizer or (b) \_\_\_\_\_ is said to be (c) \_\_\_\_\_. Food that is grown (d) \_\_\_\_\_ also has a smaller footprint because very little (e) \_\_\_\_\_ fuels were used for (f) \_\_\_\_\_. Such food can be found in most towns at (g) \_\_\_\_\_ markets.

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

a) Why did people eat more locally grown vegetables 200 years ago?

- A People did not trust food grown by foreigners.
- B People thought food grown near home tasted better.
- C Food grown in other places often carried diseases to local crops.
- D Ways to ship food over long distances had not been invented yet.

b) Which of these is used to grow organic food?

- A water
- B pesticides
- C herbicides
- D chemical fertilizer

c) Which of these ways of food shopping reduces the carbon footprint of the food?

- A Buying food that is frozen.
- B Buying food that is not quite ripe.
- C Buying food in bulk that has no packaging.
- D Buying food tightly sealed in plastic to keep it fresh.



# Greener Vegetables

Most of the food in American cities are grown hundreds of miles away using large tractors, chemical **fertilizer**, and **pesticides**. In the old-time villages described in the transportation section, food was grown just outside the city and brought in to markets on market days. Many people also had their own vegetable gardens inside the city.



Local farm vegetables

Some of the new green cities being built are designed the same way. Food is grown nearby or inside the city, which cuts down on carbon dioxide emissions by trucks bringing food into the town. The crops also absorb some of the CO<sub>2</sub> the city produces and lowers the temperature in the summer. When crops for a green city are grown without the use of chemical fertilizer and pesticides, the produce is said to be **organic**. Organic produce has a lower carbon footprint because the manufacture of fertilizer and pesticides releases CO<sub>2</sub>.



How is organically grown food different from other food?

\_\_\_\_\_

\_\_\_\_\_

It is easier to design a new carbon neutral city than to make a big reduction in the carbon footprint of an existing city. But can it be done? Recent history of the island nation of Cuba shows that it is possible.

In 1991, Cuba lost its main supply of oil, and suddenly they had to get along with only 10% as much fuel. At that time, their farms were much like those in the United States. Cubans used tractors, fertilizer, and pesticides that all depended on oil.

The next ten years were hard for many Cubans, but they successfully changed the farming system to one that did not depend on fossil fuels. The farms were moved closer to and even inside of the cities. Tractors were replaced by human and animal power. Organic methods of farming were required by law. It would be good if other countries made the same kinds of changes. If we get started now, maybe the change won't be as painful as it was for the Cubans.



# Greener Vegetables

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

- a) Vegetables bought from nearby farms have a lower carbon footprint than vegetables shipped from distant farms.  
**TRUE**      **FALSE**
- b) Spraying crops with pesticides reduces the carbon footprint of the crops.  
**TRUE**      **FALSE**
- c) The design of some new carbon neutral towns is similar to that of old-style villages.  
**TRUE**      **FALSE**
- d) Growing crops in and around cities can lower the summer temperature of the cities.  
**TRUE**      **FALSE**
- e) Most food bought in supermarkets is grown organically.  
**TRUE**      **FALSE**
- f) Modern packaging techniques have lowered the carbon footprint of fruits and vegetables.  
**TRUE**      **FALSE**

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

a) Where are you most likely to find locally grown, organic vegetables?

- A At a farmers' market.
- B At a convenience store.
- C At a large supermarket.
- D At a large discount store.

b) Why did Cubans move their farms closer to the cities?

- A To save gasoline.
- B To make the food fresher.
- C To teach city people about farming.
- D To make the surrounding land more attractive.

c) Why did people who lived in towns 200 years ago have smaller lawns?

- A Because they did not have lawnmowers.
- B Because they were too busy to do lawn care.
- C Because they had almost no land around their houses.
- D Because they used most of their land to grow vegetables.



# Greener Vegetables

3. Answer the questions in complete sentences.

- a) Explain how city planning can lower the carbon footprint of the food bought by the people who live there.

\_\_\_\_\_

\_\_\_\_\_

- b) Describe two factors that add to the carbon footprint of food.

\_\_\_\_\_

\_\_\_\_\_

Extensions & Applications

Imagine that you are going shopping to buy the fruits and vegetables your family will eat during the coming week. Describe three ways you could reduce the footprint of that food by choosing where to shop and what to buy.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_



# CALCULATING YOUR COMMUNITY'S NEW, IMPROVED CARBON FOOTPRINT

Like the community carbon footprint, the amounts of these carbon reductions are not perfectly accurate, but they will be close enough to give you a good idea of the results of people's efforts. When you think about each of the community changes below, think of the change spread over a period of ten years. Be sure to ask for help with the math if you need it.

### Government Incentives

Governments often try to reduce the community footprint by encouraging and helping people reduce their personal footprints. For example:

- The government might pay part of the price of energy saving devices.
- The government might not tax money spent on footprint reduction.
- The government might offer low interest loans to people buying energy saving devices.
- The government might offer free advice on how to reduce personal footprints.

Look at each of these energy saving devices and take a guess at the number of households in your community that would buy the device if they got some help from the government.

### GOVERNMENT HELP REDUCING HOME FOOTPRINT

#### Light Bulbs:

How many people would replace their old-style light bulbs if they were able to buy energy efficient fluorescent bulbs at the same price? Each household that replaces bulbs would reduce the carbon footprint by about 1 ton per year.

(number of households likely to replace bulbs) × (1 ton) = \_\_\_\_\_ Tons

#### Double pane windows:

How many people would replace single pane windows with double pane windows if they got some help from the government? Each household that replaces windows would reduce the carbon footprint by about 1.5 tons.

(number of households likely to replace windows) × (1.5 tons) = \_\_\_\_\_ Tons

#### Solar hot water:

How many people would install a solar hot water heater if they got some help from the government? Each household that installs a solar hot water heater would reduce the carbon footprint by about 1.5 tons.

(number of households likely to install solar hot water) × (1.5 tons) = \_\_\_\_\_ Tons

#### Photovoltaic cells:

How many people would install enough photovoltaic cells to produce all their own electricity if they got some help from the government? Each household that installs photovoltaic cells would reduce the carbon footprint by about 2 tons.

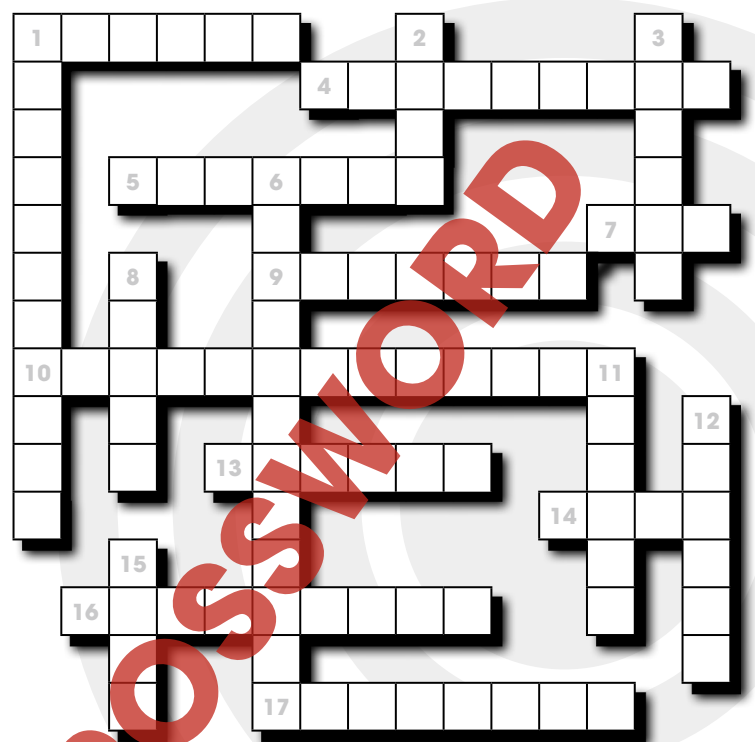
(number of households likely to install photovoltaic cells) × (2 tons) = \_\_\_\_\_ Tons

**Total reduction of home footprint = \_\_\_\_\_ Tons**

# Crossword Puzzle!

### Across

- Solar power is either passive or \_\_\_\_\_.
- Martial arts masters get a black belt, and some cities get a \_\_\_\_\_.
- People sharing rides to work.
- Carbon dioxide is a greenhouse \_\_\_\_\_.
- The kind of vegetables that are grown without pesticides.
- People who work at home using a computer and telephone.
- This type of fuel releases carbon dioxide when it burns.
- Coal is a fossil \_\_\_\_\_.
- Per person.
- Someone on his or her way to work.



### Down

- The type of fuels that are used to replace fossil fuels.
- Photovoltaic \_\_\_\_\_.
- \_\_\_\_\_ climate change.
- The type of device that changes the sun's energy directly into electricity.
- Having to do with the sun.
- A neighborhood outside a city.
- When a city absorbs the sun's energy, it creates a heat \_\_\_\_\_.
- What greenhouse gases trap.

### Word List

active	fuel	organic
alternative	gas	per capita
carpool	global	photovoltaic
cell	greenbelt	solar
commuter	heat	suburb
fossil	island	telecommuters

# Comprehension Quiz

### Part A

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

SUBTOTAL: /10

# Alternative Transportation



Bicycle



City transit bus



Carpool



Walking



Self-balancing personal transportation device



Electric scooter



# Greener Vegetables



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

a) Explain how city planning can lower the carbon footprint of the food bought by the people who live there.

---

---

b) Describe two factors that add to the carbon footprint of food.

---

---

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### Extensions & Applications

Imagine that you are going shopping to buy the fruits and vegetables your family will eat during the coming week. Describe three ways you could reduce the footprint of that food by choosing where to shop and what to buy.

1. \_\_\_\_\_

---

2. \_\_\_\_\_

---

3. \_\_\_\_\_

---



3.

(Answers will vary.) The city can be made small enough to make it unnecessary to drive to work, shop, or school.

(Answers will vary.) Shipping and manufacture of pesticides used on crops both release greenhouse gases and add to the carbon footprint of food.

### Extensions & Applications

Buy locally grown food at a farmers' market instead of food shipped from a distant farm.

Take a reusable shopping bag to put your food purchases in.

Buy organically grown food.



# EASY MARKING ANSWER KEY