

How does an object s colo much radiation the object

You will need:

4 thermometers

4 shoe boxes (or boxes of similar size) White, yellow, green, and black construction paper

This activity must be done on a sunny day.

Different surfaces on Earth reflect and absorb differ Sun's radiation. Some surfaces, like thick clouds and radiation. Other surfaces, such as asphalt and soil, abso The color of a surface plays a big role in determining the surface will absorb

Cover four different shoe boxes with different color green, and black. Place a thermometer inside each the temperature reading on each of the thermom of the shoe boxes in a sunny location for a few ho still on the boxes, take each thermometer out and the temperature reading in the chart below. Which temperature? Which box had the lowest temperat data, draw conclusions about how color affects the that an object absorbs.

Tem

Climate and Human Civiliz 1. Think about how early humans lived before they developed agric technology to build houses. On the lines below, describe how you would have been affected by changes in Earth's climate. 2. Match the term on the left to its definition on the right. You may use help you. evolve to change from a liquid to a solid society became smaller 3 shrunk a place that is able to be lived in forage to change characteristics over man

freeze habitable

NAME:

b) Describe how the shorelines of North America would have looked different 650,000 years ago.

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Research

4. Learn more about the lives of early humans, and how they would have been affected by climate. Use the library or internet resources to learn about how human societies evolved from hunting and gathering, to agriculture and building, to the formation of cities and modern technology.

Choose a period in early human history and create a diorama showing a typical setting for your period. Use clay or other materials to model humans doing everyday activities that they would need to do for survival. Include the type of shelter humans would have used to protect themselves from bad weather in your time period. Share your model with the class, and explain how the humans in your time period would have been affected by global changes

FALSE

TRUE if the statement is TRUE OF Circle the word FALSE

Comprehension Quiz

house gas emissions come from burning fossil fuels.

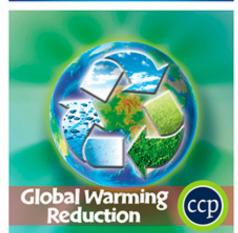
op emitting greenhouse gases today, Earth's average

Global Warming (сср Causes

AVAGVAGVAGVAGVAGV



© CLASS





re will start to go down right away. fuels release more greenhouse gases than fossil fuels. **FALSE** sources of energy are replaced by nature faster than they **FALSE** tric generators change energy from sunlight into electricity. FALSE made with recycled materials most likely used less energy t the same product made with raw materials. nat are manufactured are made by people using raw mater FALSE ts and vegetables grown near where you live is one way to nhouse gas emissions. low, list five transportation choices that result in less gree lhan driving individual vehicles.

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re**S**press

SUBTO

Reading Passage

Before You

to search in nature for plants to

a group of people living and v

57

medicine

Climate and Human Civilization

arth's climate has gone through many changes in its history. Humans have been around for only a tiny part of Earth's history. But climate changes over the past 1 million years have greatly affected the development of humans and human societies.

During the time that humans and their early relatives have been evolving, Earth's climate has gone through many cyclical changes. Ice sheets have grown and shrunk as a result of changes in Earth's

temperature. At one point, 200,000 years ago, thick ice sheets covered much of North America. Great rivers carried melt water from the ice sheets to the oceans.



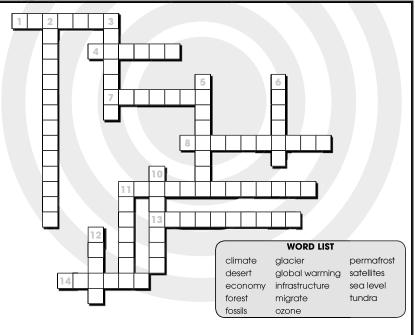
During what period of time did ice sheets cover much of

Climate changes affected how early humans moved, or migrated, around the world. Early humans had to hunt wild animals and forage for wild plants for food. When changes in climate caused droughts or movement of ice sheets, humans often had to move to follow their food supply. Climate changes also opened new lands for humans. Most of the water that freezes to form ice sheets comes from the ocean. As ice sheets grow, the level of water in the oceans, or **sea level**, drops. As sea level drops, new lands are exposed for people to live on or move across. When the climate warms and the ice sheets melt, sea level rises and floods areas that were once dry. Early humans moved to find habitable places to live.

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Global Warming CC5772

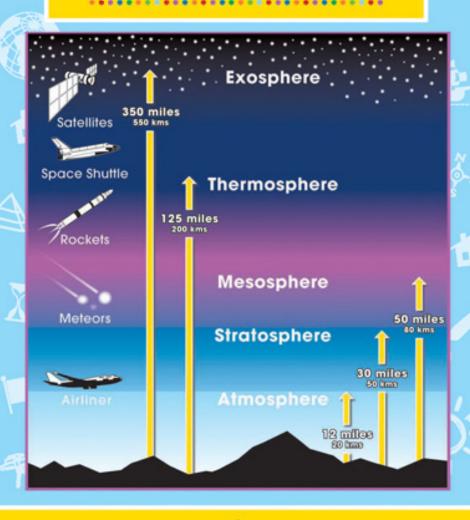


1. the average weather conditions over time 2. the permanent parts of cities

- **4.** a common ecosystem in North America filled with trees

- 7. when people move from one area to
 - around in the tundra
- 3. the use of money by a government
- 5. where the ocean meets land
- 6. a hot, dry ecosystem
 - 10. remains of once-living things preserved in rock

Layers of the Atmosphere



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Gliobal Warming CC\$772



١	TEACHER GUIDE								
	Assessment Rubric	5							
	How Is Our Resource Organized?	6							
	Bloom's Taxonomy for Reading Comprehension	7							
	Vocabulary	7							

STUDENT HANDOUTS Reducing Your Own Carbon Footprint · Climate Change Has Your Footprint On It ... • Your Footprint At Home ... A Footprint On Your Dinner Plate • Your Travel Footprint . • Footprints At The Mall And In The Trash

· Your Slice Of The Shared Footprint .. How To Make Your Footprint Smaller And Why You Should · Graphic Organizer... Carbon Footprint Calculator....... Calculating Your New, Improved Carbon Footprint...... Crossword. Word Search

 Comprehension Quiz **Reducing Your School's Carbon Footprint** Your School and Climate Change How Your School Uses Energy

 Cars. Buses. Bicvcles. and Feet ... · Footprints in Your Lunch . • We Recycle Cans, Trees Recycle Carbon... Study Green.. • Reduce What You Can and Offset the Rest ...

 Carbon Footprint Calculator · Calculating Your School's New, Improved Carbon Footprint. Crossword

· Word Search · Comprehension Quiz (3) © CLASSROOM COMPLETE PRESS

· Graphic Organizer...



Carbon Footprint Cald

On this and the following page you can calculate your school's different parts of your footprint are arranged in the same order book. The calculations will be done in pounds per year (lbs./yr.) to tons/yr. One ton = 2000 lbs. If you don't understand how to d

For each of the four parts of your school footprint, you will have Some of the numbers you will need may take some time to coll it is a good idea to work in groups and share the leg work. Sugg information are given under the heading of each part of the fo

Transportation

Your school probably uses electricity and one type of fuel. You v of each kind of energy used by the school for the entire school on the school's energy bills. Ask your teacher or principal where They might also be found in the school's annual budget. The nun kilowatt-hours (kWh) of electricity, therms or 100 cubic feet (100 tons of coal. Multiplying each of these times the number in the e units/vr. to lbs. of CO₂/vr. If all you can find are monthly bills, you v amount for an average month by the number of months in the s

Electricity: $_{kWh/yr.} \times (1.75) = _{_{}}$ therms, gal. or $100 \text{ ft}^3/\text{yr.} \times (11) =$ Gas: Oil: gal. /yr.) × (24) = _ lbs. $tons/yr.) \times (5,000) =$ Coal: Total emissions due to school energy use:

First find the number of days in the school year and the average daily attenda



3. Answer the qu a) What inform

caused by

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.

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After You Read

FALSE de is a greenhouse gas. **FALSE**

FALSE

FALSE

FALSE

FALSE

FALSE

nity carbon footprint is the same as your personal carbon foot

unities generate all their own electricity from renewable source

ral communities are being built in countries around the world.

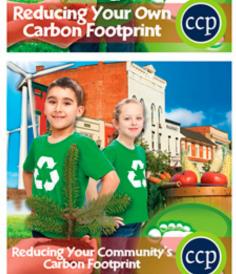
on low-lying islands are looking forward to a rise in global tem

and to your community increases its carbon footprint.

Comprehension Quiz

many show up—not how many are supposed to show up). Next do a survey of 50 students chosen so they are scattered evenly throughout the school. For exc could leave a survey form at every tenth locker, but don't choose the first 50 st off buses. The questions will be: how do you get to school? How many total mile each day on your way to and from school? If you carpool, how many student Circle) the word TRUE if the statement is TRUE or Circle) the word FALSE if it is FAL te change is caused by a change in the amount of greenhou

educing Your School
Carbon Footprint



Bundle Grades 5-8

Carbon Footprint Big Book



Your Footprint At Hon

NAME:

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

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 clotheslir FALSE TRUE

Modern appliances are usually less efficient than old one

TRUE FALSE

Most factories have a carbon footprint.

FALSE

2. Put a check mark (\checkmark) next to the answer that is most correct. a) An electricity bill shows how much energy you used in units

O B amps

O **c** electrons

O **p** kilowatt-hours

TRUE

b) What is the source of energy for most of the electricity gen States?

O a solar cells

O B fossil fuels

O **c** hydroelectric dams O **p** nuclear power plants

c) All of these release CO2 into the atmosphere, except

O **a** a gas stove

O **B** a solar cell O c a diesel truck

O **p** a wood-burning fireplace

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b) Describe the steps in the calculation after you have gathered the information

caused by your

Across

NAME:

activities 5. What CO, is to the photosynthesis

1. The tons of carbon

process. 7. EPA Energy

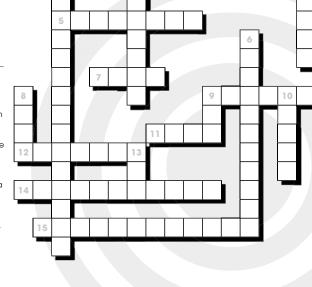
9. All over the Earth.

11. Compounds that enter the atmosphere when paint is sprayed. (abbreviation)

12. Rising temperature is one example of global change.

14. Circulating air in a building. 15. Energy inefficient

light bulbs with a tungsten filament.



Down

2. It cools the inside of a building on a hot day.

3. Coal, oil, and _

4. The unit for measuring the amount of natural

6. The energy efficient kind of light bulbs.

8. The system that heats, cools, and circulates ding. (abbreviation)

Word List fluorescen HVAC

Reading Passage

Your Footprint At Home

is much simpler than that. You probably use only two or three kinds of

company. They keep careful records so they know how much to charge

energy. Each kind of energy is sold to your household by an energy

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

We have already seen that the combustion of coal, oil, and gas releases

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

CO₂, but why is electricity part of the footprint? Most electricity is generated

Identify two forms of energy sold to home owners by

you. The amounts of each kind of energy are shown on the bill.

power companies.

hink of all the things you have at home that use some kind of

comes from the combustion of fossil fuels.

If you are thinking you will have to figure

the carbon footprint of every appliance

and electronic device, you can relax. It

So everything in your home that uses

energy puts carbon dioxide into the

atmosphere.

measured in tons.

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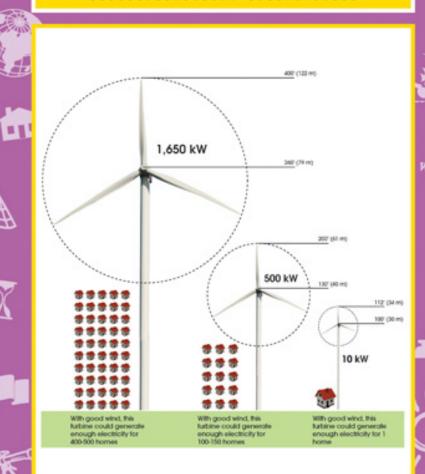
energy, All or most of that energy

ventilation

Wind Turbine Capacity

natural

air conditioning



 (\checkmark) next to the answer that is most correct. ntion was the main cause of cities and communities but to cover more land?

evision l phone tomobile

ctric ligh

ge in a community's food supply would reduce its carbon fo ring food from farmers closer to home

roving packaging to keep food fresh longer ng more chemical fertilizer to increase crop yield

ing more food than you need to be ready for natural disasters rb more solar energy than the surrounding countryside, cre rbon offset level rise

enhouse effect E PRESS

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SUBTO

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Globalization CC5785

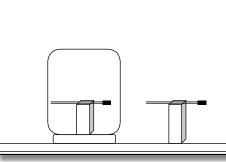




Build a Greenhouse

For this activity you will need:

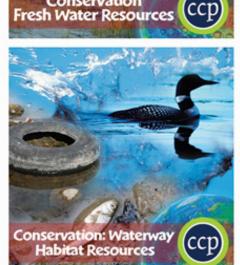
- A large glass jar, a glass goldfish bowl, or a glass aquarium
- Two thermometers
- · Any two flat-topped objects about half as high as the jai This is what you will do:
- 1. Take all your materials outside on a sunny day.
- 2. Read and record the temperature on one of your therm
- 3. Arrange your experiment as shown below



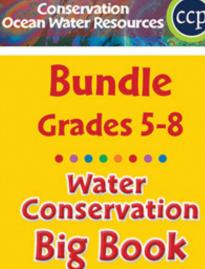
4. Read the thermometers every 15 minutes for two hours. How did the temperatures inside and outside the glass container compare



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Conservation



NAME: Before You What Is Fresh Water? 1. Circle the word TRUE if the statement is TRUE or Circle the if it is FALSE. a) Ocean water is called fresh water if it is not polluted. **FALSE** b) Most of Earth's water is in rivers. **FALSE** c) Snow is a form of precipitation. TRUE **FALSE** d) Water can be a solid, a liquid, or a gas. TRUE **FALSE** e) Animals cannot live without water. **FALSE** 2. Complete each sentence with a word from the list. Use a diction evaporation condense a) Solid water is called b) Water in the atmosphere is called water _ _s, it changes from solid t c) When water_ d) Dew forms on the grass when water in the air _ each of the th moves water from the ocean to water can exis

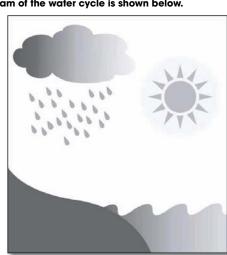
9

Extensions & Applications

above Earth's

An unlabeled diagram of the water cycle is shown below.

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Show the processes in the water cycle by completing the diagram.

- a) Draw the arrows that show the movement of water in the water cycle.
- b) For each arrow, write the name of the process indicated by the arrow.

After You Read 🔷

Comprehension Quiz

TRUE if the statement is TRUE **or** Circle) the word **FALSE** if it is

piotic factors cannot share the same ecosystem. stems were in the ocean. **FALSE** eenhouse gas. FALSE ce has made it easier for polar bears to adapt to the Arctic. fossil fuels can cause acid rain. **FALSE** ities brought most invasive species to freshwater ecosystems. **FALSE** re endangered by human activities. FALSE

irk (\checkmark) next to the answer that is most correct. c) What is the basic cause of roduct of photosynthesis? extinctions? O **A** predators gen

O **B** overpopulation on dioxide \bigcirc **c** natural disasters um chloride

he most important n most aquatic

teria tebrates SUBTO 136 E PRESS

D failure to adapt to a



Reading Passage

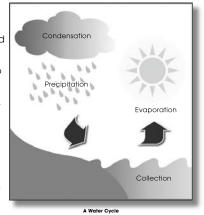
NAME:

What Is Fresh Water?

hen we say water is fresh, it just means it is not salty, like water in the ocean. When used

to describe water, the word fresh has a different meaning than when it is used to describe vegetables. Fresh vegetables are not rotten, but fresh water is not salty. So water could be fresh but still not fit to

Water is all around you. It is on Earth's surface, deep in the Earth, in the air, and inside you. Like most living things, you are



People have some very important needs that can only be satisfied by fresh water. We must have fresh water to drink because our bodies need it to carry out all the reactions and processes in every one of our cells. Only fresh water can be used to water crops and other plants. Many fish and other forms of life can only live in fresh water.



Describe two things that fresh water is used for. Be sure only fresh water and not salt water or other liquids could be used for these purposes.

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- 2. The chemical formula of
- **6.** A part of the ocean where fish cannot live.
- 11. This keeps Earth's heat from escaping into space.
- 13. This inland salt sea in Asia has lost 75% of its surface
- 14. Solid water
- **15.** When water evaporates, it becomes water
- 17. A giant ice cube floating in
- 19. Saving resources by using them more carefully.
- $\textbf{20.} \ \, \text{Oil, coal, and natural gas}$

Down

- All the gases above Earth's surface make up the 3. Rising global temperature is
- an example of this.
- 4. Any one of the gases that trap Earth's heat.
- 5. A large body of water. 7. The process before precipitation.
- 8. 3.5% is the _
- salt in sea water.

 9. This process cannot take place below an ocean
- . depth of 2000 feet 10. Removing the salt from salt

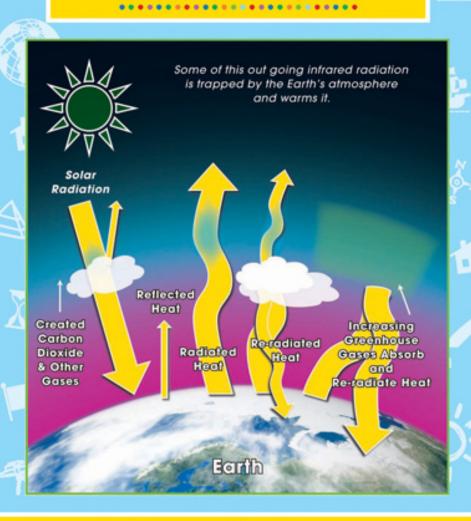
ARAI ATMOSPHERE ATOLL

CLIMATE CHANGE

Word List DEAD ZONE GREENHOUSE EFFECT

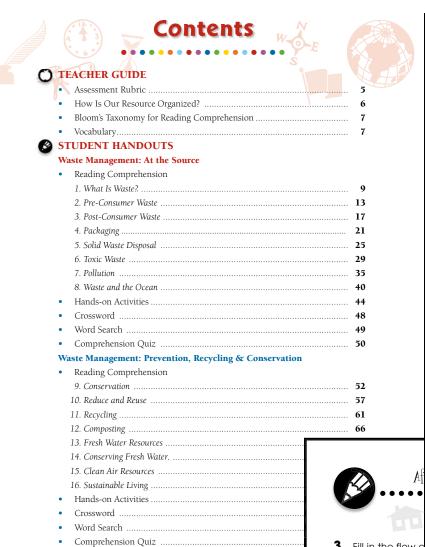
PHOTOSYNTHESIS

The Greenhouse Effect



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3. Fill in the flow how people g the notebook Describe how

2. Making the notebook 1. Getting the raw

NAME:

dictionary to help you.

Product

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raw materials

solid

pre-consumer waste

3. Delivering the notebook

13

Pre-Consumer Waste

A person who uses of

wood, metal, rock, and oth

all of the living and nonliv

leftover material from ma

a form of matter that h

the earth used to mak

surround you

shape and volu

Raw Materials

1. Think about the chair you are sitting in. How was it made? What ro

your chair? What types of wastes were produced when your chai

Draw a line from the word on the left to its definition on the right.

3. In the left column, list three products that you use in everyday life

column with the raw materials used to make those products.

Extension & Application

4. Design a brochure which will convince factories to lessen the amount of pre-consumer waste they produce. Choose any product, and write your brochure to the factory that makes that product.

In your brochure, be sure to include:

- information about the raw materials used in your product
- the benefits to the factory of using fewer raw materials • ways that they can save raw materials, or use less to make the same

© CLASS

Collect all of the entries. Write a judging checklist that all of th your checklist, think about what are the most important things y Do you want to use a point system for judging?

Hands-On Activity # 2

Hold a contest at your school to find the most USEFUL and CREA

items. Work with a small group to run a contest for your class, or

Create posters to advertise the contest. Be sure your posters and

• Why should students enter the contest? Tell students why it

• Where is the contest located? Where should students drop

• When will the entries be judged? When is the deadline for

How will the entries be judged? What are the judges looking

one category of winners? For example, you may want to o

• Who will judge the entries? Who is allowed to enter?

practical reuse, and another for the most creative.

• What are the contest rules? What are the prizes?

Reuse Contest

Part C

Part B

Choose the winners and runners-up. Keep the best projects on display for a parents, teachers, and students to view.

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

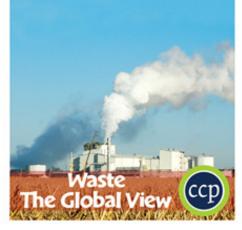
Waste At The Source (ccp)

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run a contest for your school.

instead of throwing them away.







Waste Management **Big Book**

are an example of agricultural waste

ning waste can contaminate water supplies.

FALSE

illed from a tanker, it spreads out on the ocean floor. FALSE

dioactive waste can remain harmful for thousands of years.

rom Hurricane Katrina is still a problem.

FALSE

eces of space junk can be found orbiting Earth. FALSE

cs is the study of how much money it costs to dispose of organ

can cause air pollution **FALSE**

rk (\checkmark) next to the answer that is most correct.

waste?

2. Which of these substance found in waste from meta

D fungicides

O **p** nuclear plant

ium ore O **A** acids \bigcirc **B** oil machines 0 er medicines **c** sewage

fuel rods ese is an example of waste?

4. Which facility will help a community practice zero

O **A** biogas O **B** incinerator O **c** landfill

inum e**€**PRESS



SUBTO

Reading Passage

Pre-Consumer Waste

NAME:

nat types of manufactured products are around you right now? Perhaps books, pens, desks, a clock. All of these things are made in factories from **raw materials**. During the manufacturing process, some of the raw materials end up as waste. Waste from manufactured products is often called solid waste, because it is made up of mostly solids, such as wood and metal scraps.

Many people think of solid waste as parts of a product thrown away after use. However, most solid waste is actually created before a product even gets to you! This type of waste is called **pre-consumer waste**. A consumer is simply a person who uses a product. The prefix "pre" is added to mean "before."



Describe the meaning of the word pre-consumer waste. Give an example of pre-consumer waste.

What happens to pre-consumer waste?

For every top of waste that people throw away after they buy products, twenty tons of waste was made to make those products. Finding a place to dispose of pre-consumer waste from factories can be a problem. Long ago, factories used to dump large amounts of solid waste into the environment. Now, stricter laws control how this waste must be

Getting raw materials can be costly and harmful to the environment. For example, metal mines need expensive machinery to



operate. Large areas of land must be moved, and the area becomes unsuitable for When manufacturing first began, raw materials seemed plentiful. Land and space for

wildlife also seemed plentiful. Pre-consumer waste was often simply thrown away. Now, things have changed. Raw materials are harder to find and more expensive to get. More land is used by people, so less land is available to wildlife. People now look for ways to make manufacturing less wasteful, and to save and reuse scraps instead of throwing

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

aluminum	fuel	nonrenewable	sewer
composting	glass	paper	soil
contaminate	hazardous	petroleum oil	stone
copper	humus	plastic	toxic
decomposers	land	pollution	waste
drain	metal	reservoir	windmills
earthworms	natural resources	runoff	

Н	Α	Ν	Α	T	U	R	Α	L	R	Е	S	0	U	R	С	Е	-
U	Α	S	D	F	G	Н	J	К	L	Q	W	Е	R	Т	Υ	U	Г
М	Р	Е	Т	R	0	L	Е	U	М	0	Ι	L	В	V	С	Х	7
U	С	٧	В	Ν	М	Α	L	U	М	Ι	Ν	U	М	Q	W	C	
S	Α	D	Ν	Α	L	S	Ν	D	F	G	Н	J	K	L	С	0	
Z	Х	С	٧	В	Ν	М	0	L	Z	Χ	W	U	٧	Е	В	Ν	
Α	М	F	S	D	R	U	Ν	0	F	F	F	Α	G	Α	Н	T	9
Ζ	Х	Е	U	С	Р	٧	R	В	D	Ν	Ν	М	S	R	Q	Α	١
Α	S	D	T	Е	0	F	Е	G	Е	Н	J	K	L	T	Z	М	
Х	С	٧	В	Α	L	Α	Ν	S	С	D	F	Н	G	Н	Ε	1	L
S	0	1	L	S	L	D	Ε	T	0	Υ	٧	Α	Z	W	F	Ν	Ŀ
Q	W	Ε	R	T	U	F	W	G	М	U	1	Z	Χ	0	С	Α	(
W	D	F	G	Н	T	J	Α	Κ	Р	L	Z	Α	Χ	R	С	T	(
Q	I	W	Ε	R	1	T	В	Υ	0	U	Z	R	Χ	М	С	Ε	1
Х	С	Ν	٧	В	0	Ν	L	М	S	Q	T	D	W	S	Ε	R	L
Р	Х	С	D	٧	Ν	R	Е	S	Е	R	٧	0	1	R	В	Ν	٠
L	Α	Q	W	М	Ε	R	T	Υ	R	Z	Χ	U	Χ	С	٧	В	L
Α	Z	Р	Χ	С	-1	٧	В	S	S	G	D	S	Q	1	W	Е	L
S	Q	S	Е	Α	S	L	Q	W	1	L	Α	U	Α	U	С	Р	L
Т	Α	D	Т	R	D	Ζ	L	Е	U	Α	S	1	S	1	Q	0	

Waste in Our Oceans















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Waste Management CC5767