



**TEACHER GUIDE**

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

**STUDENT HANDOUTS**

- Reading Comprehension
  - 1. Agricultural Waste ..... 7
  - 2. Waste from Mining ..... 7
  - 3. Oil Spills ..... 7
  - 4. Radioactive Waste ..... 7
  - 5. Waste from Natural Disasters ..... 7
  - 6. Space Junk ..... 7
  - 7. The Costs of Waste ..... 7
  - 8. Waste Management Success Stories ..... 7
- Hands-on Activities ..... 11
- Crossword ..... 15
- Word Search ..... 16
- Comprehension Quiz ..... 17

**EASY MARKING™ ANSWER KEY** ..... 19

**MINI POSTERS** ..... 21

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# Space Junk



1. What types of objects have humans launched into space?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Use a dictionary to look up the words ORBIT and SATELLITE. Write the definition on the lines below.

a) The definition of orbit is:

\_\_\_\_\_  
\_\_\_\_\_

b) The definition of satellite is:

\_\_\_\_\_  
\_\_\_\_\_

3. Match word to its meaning. You may use a dictionary to help you.

1	weather	costs a lot of money	A
2	passenger	the movement of air and water in Earth's atmosphere	B
3	treason	people talking or sending messages to each other	C
4	telescope	a tool used to see objects that are very far away	D
5	communications	a person who travels in a vehicle	E



# Space Junk



What is space junk?

Objects in space that orbit Earth are called **satellites**. Humans have been sending satellites into space since 1957. Since that time, the space around Earth has been getting filled with human-made waste, sometimes called **space junk**. Space junk comes from many sources. Satellites travel to space on **rockets**. Usually, more than one rocket is used for each satellite. As each rocket is used up, it simply drops off the satellite. If the satellite is high enough above Earth, the rocket stays in orbit instead of falling to the ground. Other types of space junk include old, unused spy and weather satellites; and small pieces of spacecraft that break off in space.

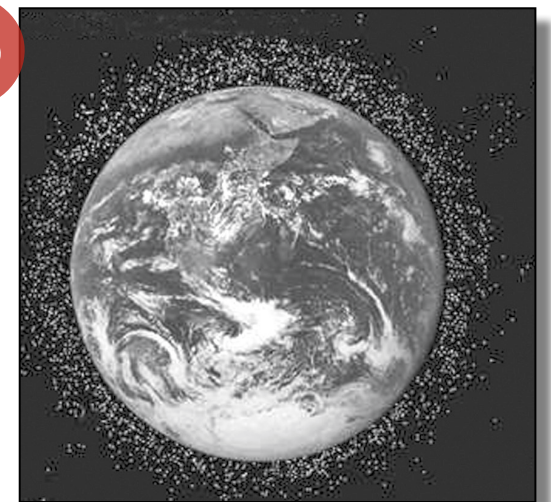


Describe the meaning of the term *space junk*.

\_\_\_\_\_  
\_\_\_\_\_

Why is space junk a problem?

If a space craft is hit by a piece of space junk, the space craft can be destroyed. Even a small piece of space junk could punch a hole in the wall of a **shuttle** or **space station**, putting the lives of human **passengers** at risk. Space junk could destroy expensive **robotic missions** to other planets, **space telescopes**, and important communications and weather satellites in orbit around Earth. It is the job of the U.S. Space Surveillance network to keep track of the location of all known space junk. Right now, they are tracking 13,000 pieces of space junk larger than four inches (ten centimeters)! The model at the right shows the area where these objects are located. Many space scientists think that we need to start sending up space clean-up missions to remove larger pieces of space junk.



# Space Junk



1. Fill in each blank with the correct term from the list below.

satellites	space junk	rockets	orbit
missions	planets	wall	spacecraft

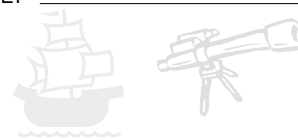
- a) Some space junk is caused by small pieces of \_\_\_\_\_ that break off in space.
- b) When \_\_\_\_\_ finish firing, they fall off.
- c) Space junk includes old, unused spy \_\_\_\_\_.
- d) Small pieces of space junk can put a hole in the \_\_\_\_\_ of a space shuttle.
- e) Space junk can damage robotic missions to other \_\_\_\_\_.
- f) Many space scientists think that we need to send clean-up \_\_\_\_\_ to take down large pieces of space junk.
- g) All of the unused waste objects orbiting Earth are \_\_\_\_\_.
- h) Space junk is in \_\_\_\_\_ around Earth.

2. On the lines below, list five examples of space junk.

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



# Space Junk



3. Explain why space junk can be dangerous. Give examples to support your reasoning.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Write your ideas about how people can solve the problem of space junk.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Extension & Application

5. Make a model of space junk!

Materials you can use for this project include:

- clay
- paper
- toothpicks
- wire
- aluminum foil

Scientists are tracking more than 13,000 pieces of space junk in orbit around Earth! This space junk includes everything from large, unused satellites to small pieces of insulation.

Research additional examples of space junk. Find photographs of satellites and rocket boosters, so that you have some idea of what space junk might look like. Then, **create a three-dimensional model of Earth with space junk in orbit**. Be creative! Since you will not be able to make 13,000 pieces of space junk, you should include a key that shows how many actual pieces of space junk one of your model pieces represents. For example, if your model includes 130 pieces of space junk, each piece in the model represents 100 actual pieces of space junk.

Display your model in class.



# Nuclear Fuel Debate

Set up a class debate about the use of nuclear energy to make electricity. Nuclear energy has **ADVANTAGES** and **DISADVANTAGES**. It does not create air pollution like burning fossil fuels. It does not add greenhouse gases to the atmosphere. However, it does have the problem of creating radioactive waste.

## BEFORE YOU BEGIN

Have students choose whether they will argue **for** or **against** the use of nuclear energy to make electricity. Or, have students draw straws to be randomly assigned to one group or the other.

## DO YOUR RESEARCH

Together as a group, research all of the advantages and disadvantages of nuclear energy. Read what experts have to say on both sides of the issue. Find out how much nuclear energy costs compared to other types of energy. Then, try to analyze the bio-economic costs of nuclear energy compared to other types of energy.

Write a list of **five main points** that your group would like to make in the debate. After you write your list, try to think of what the other group might say in response to your points. Talk about how you will respond to arguments about the points you are making.

Choose one person in your group to make each of the points. If there are more people left in your group, choose one person to respond to each of the other team's points.

## CONDUCT THE DEBATE

In the debate, each side will have 2 minutes to make each of their points. Teams will take turns. Team A will make their first point, then Team B will have 2 minutes to make an argument against that point. Finally, Team A has one additional minute to respond to Team B's argument. Then, Team B has 2 minutes to make their first point. Team A will have 2 minutes to make an argument against that point. Then, Team B has one additional minute to respond to Team A's argument. This process continues until all of the points have been made.

# Word Search

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

- |           |             |            |              |
|-----------|-------------|------------|--------------|
| habitat   | acid        | fuel rods  | hazardous    |
| reduce    | fertilizer  | disposable | Exxon Valdez |
| nuclear   | recycle     | profits    | biogas       |
| mining    | landfill    | debris     | industries   |
| fungicide | cyanide     | Chernobyl  | atom         |
| reuse     | sustainable | Kovalam    | toxic        |
| uranium   | space junk  | economics  | rock         |

A	D	S	D	F	G	H	J	K	L	R	Z	D	X	C	R	V	R
Z	S	F	E	R	T	I	L	I	Z	E	R	E	G	C	V	O	Q
A	D	U	A	A	Q	S	O	Q	A	D	A	B	Q	A	C	S	W
S	I	N	S	S	W	D	P	W	S	D	S	R	W	K	Q	P	E
D	S	G	S	T	E	F	U	E	D	C	D	I	E	C	W	A	R
F	P	I	D	D	A	G	R	R	R	E	U	S	E	H	E	C	T
G	O	C	F	F	R	I	A	L	F	Z	F	Q	T	E	R	E	Y
H	S	I	G	G	R	H	N	T	A	X	G	W	Y	R	T	J	U
J	A	D	H	P	E	C	I	A	G	N	H	E	U	N	Y	U	I
K	B	E	J	R	C	Y	U	B	C	D	R	I	O	U	N	O	
I	L	A	K	O	Y	A	M	U	H	L	J	F	O	B	I	K	P
N	E	S	L	F	C	N	A	N	J	V	E	T	I	Y	O	Q	A
D	H	D	P	L	I	S	U	K	B	C	Y	P	L	P	W	S	
U	S	A	Q	I	E	D	D	C	L	T	O	M	A	S	L	E	D
S	D	F	E	S	Y	E	F	L	Q	T	N	U	I	D	A	R	F
T	F	G	M	U	J	G	E	W	N	O	I	S	N	B	T	G	
R	G	H	M	O	T	A	H	A	E	M	M	X	D	F	I	Y	H
I	H	J	E	H	C	A	J	R	R	O	I	O	I	G	O	N	J
E	J	K	R	I	I	K	T	I	T	P	C	P	F	C	G	U	G
S	K	L	D	K	O	V	A	L	A	M	S	Z	G	H	A	I	K
Z	L	H	A	Z	A	R	D	O	U	S	K	X	H	J	S	O	L
X	O	Z	T	J	O	L	X	F	U	E	L	R	O	D	S	P	Z
E	X	X	O	N	V	A	L	D	E	Z	L	C	I	K	S	L	X

## Part C

# Comprehension Quiz

Answer the questions in complete sentences.

- Describe **two** ways that farmers can lessen agricultural waste. 2
- Describe **two** types of mining waste and **compare** the amount of harm each type of waste can cause. 4
- Explain why an **oil spill** can be so harmful to a shoreline environment. Give examples to support your answer. 3
- Describe **two** ways that hazardous waste can be released in a natural disaster. 2
- Compare the **bio-economical cost** of throwing away food waste to composting food waste. 2

SUBTOTAL: /13

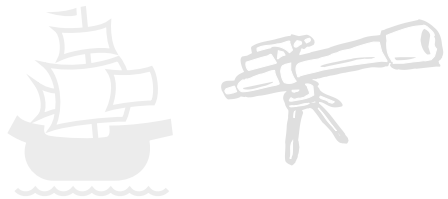
# Mining Waste

(Polluted River Downstream from Operating Mine)



NAME: \_\_\_\_\_

After You Read 



# Space Junk



3. Explain why space junk can be dangerous. Give examples to support your reasoning.

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4. Write your ideas about how people can solve the problem of space junk.

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## Extension & Application

5. Make a model of space junk!

Materials you can use for this project include:

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- paper
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# EASY MARKING ANSWER KEY

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Display your model in class.

3. Answers will vary

Answers will vary

11

4. Answers will vary

Answers will vary

12

5. Answers will vary

Answers will vary

13

10

Answers will vary

14

