9 A Better Robot

Pre-Reading

Think about the following questions.

1. What do you think of when you hear the word "robot"?
2. What would be a useful shape for a robot?
3. How can robots help science?

Vocabulary Preview

Write the letter of the word or phrase with the same meaning as the underlined word.

a. a part or unit with a specific job	d. ability to do different things well
b. jobs; chores	e. a blank or empty area
c. looking around	f. low price

1. ___ Robots are useful for <u>exploring</u> places where people can't go.
2. ___ It takes a long time to travel through <u>space</u> from Earth to Mars.
3. ___ I don't have time to complete all of these <u>tasks</u>.
4. ___ You need to attach three small <u>modules</u> to the machine's main body.
5. ___ Everyone agreed that the new design gave the robot more <u>versatility</u>.
6. ___ The <u>affordability</u> of the new machine made it attractive to our manager.

LIVEWORKSHEETS

A Better Robot

Track 17

Robots are useful for exploring and working in space. In particular, many robots have been sent to explore Mars. Such robots have usually looked like a box with wheels. Though these robots are useful, by their very nature they are unreliable, extremely expensive, and they break easily. Also, they cannot do very many tasks. Because of these problems, scientists have been developing a new and unusual kind of robot. These new robots move like snakes, so they have been given the name "snakebots."

The way a snake is **shaped** lets it get into very small spaces, like **cracks** in rocks. It can also push its way below the ground or climb up different kinds of objects, like high rocks and trees. Such abilities **account for** the usefulness of a robot designed like a snake. A snakebot would be able to do these things, too, making it much more effective than regular robots with wheels, which easily get **stuck** or fall over. Since they can carry tools, snakebots would be able to work in space, as well. They could, for example, help repair the International Space Station.

But how can such a robot shape be made? A snakebot is built like a chain made of about thirty parts, or modules. Each module is basically the same in that they all have a small computer and a wheel to aid movement. The large computer in the "head" of the snake makes all of the modules in a snakebot work together.

The modular design of the snakebot has many advantages. If one module **fails**, another can be added easily. Snakebot modules can also carry different kinds of tools, as well as cameras. Since each module is actually a robot in itself, one module can work **apart** from the rest if necessary. That is, all the modules can separate and move on their own, and then later, reconnect back into a larger robot. Researchers are also trying to develop snakebots made of a special kind of plastic that can change its shape using electricity, almost like animal muscles. Snakebots made with this plastic will be very strong and hard to break.

Overall, the snakebot design is much simpler than that of common robots. Thus, snakebots will be much less expensive to build. For example, a robot **recently** sent to Mars cost over a hundred million dollars, whereas snakebots can cost as little as a few hundred dollars. With their versatility and affordability, snakebots seem to be the wave of the future, at least as far as space robots are concerned.

Reading Time _____ minutes _____ seconds 428 words

7 *shape*: to form; to make to look like
7 *crack*: a broken place; an opening
9 *account for*: to explain; to be the reason for
11 *stuck*: unable to move
18 *fail*: to not work
21 *apart*: separate; not attached to
30 *recently*: during a short time in the past

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Reading Comprehension

Choose the best answer.

1. What is the focus of this reading?

a. How snakebots were invented
b. Similarities between snakes and robots
c. The mission of the first working snakebot
d. What a snakebot looks like and can do

2. Why are snakebots useful for exploring other planets?

a. They will be made of plastic.
b. They can move freely.
c. They can fly.
d. They have many modules.

3. How many robots make a snakebot?

a. There can be any amount.
b. One
c. About thirty
d. The reading doesn't say.

4. What could cause a snakebot to fail?

a. If all its modules were broken
b. If it fell into a hole
c. If its head came off
d. If its tail were broken

5. What is the purpose of the second paragraph?

a. To describe the problems with robots that have wheels
b. To explain the versatility and usefulness of snakebots
c. To give details of the first successful snakebot
d. To list places where snakebots have already gone

Idiomatic Expressions

Find these idioms in the reading.

- **by its very nature** [because it is a certain way]
  By its very nature, a tiger is a dangerous animal.
- **wave of the future** [a recent invention that appears to have many future applications]
  Will fashionable or wearable technology be the wave of the future?
- **as far as** [to the extent or degree that]
  I don't know about other classes, but as far as our class is concerned, the test will be on Friday.

Fill in the blank with one of the above idioms. Change its form if necessary.

1. _____ I know, she didn't ask for any help with her homework.

2. Christmas is, _____, a happy time.

3. My father thinks that solar-powered cars are the _____.

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Summary

Read the sentences from the reading passage. Paraphrase the sentences to create a summary of the passage.

a. These new robots move like snakes, so they have been given the name "snakebots."
b. The way a snake is shaped lets it get into very small spaces, like cracks in rocks.

1. a + b: Snakebots are _____
_____.

c. A snakebot is built like a chain made of about thirty parts, or modules.
d. Since each module is actually a robot in itself, each module can work apart from the rest if necessary.

2. c + d: Snakebots are _____
_____.

e. Thus, snakebots will be much less expensive to build.
f. For example, a robot recently sent to Mars cost over a hundred million dollars, whereas snakebots can cost as little as a few hundred dollars.

3. e + f: Snakebots are _____
_____
_____.

Listening

Mr. Yim's Idea

Track 18

Listen to the dialog. Check True or False for each sentence.

	True	False
1. The idea for the snakebot came from Mark Yim.	☐	☐
2. Yim designed a robot called a polybot.	☐	☐
3. These robots have many shapes, but they are all made of snakebots.	☐	☐

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Discussion

Discuss the following questions.

1. Is space exploration too dangerous for humans? Should only robots go into space?
2. How could snakebots be useful on Earth, even if we don't use them in space?
3. What is a story or movie you know of in which a robot had an important part? Briefly tell the story.

Grammar

Much, Even, Still, Far + Comparatives

Intensifying adverbs like *much*, *even*, *still*, or *far* are followed by comparatives of adjectives or adverbs.

A snakebot would be able to do these things, too, making it (much more effective / much effective) than regular robots with wheels.
Snakebots will be (very less expensive / much less expensive) to build.

Writing

Write your own short paragraph by answering the questions below.

A Movie with Robots

(1) What is a story or movie in which a robot played a big part? **(2)** What is the basic story? **(3)** When did you read or see this? **(4)** What is your opinion of the story? **(5)** Would you recommend this book or movie?

Example

A movie in which robots played a big part was Heart Beeps. It was about a male and female robot falling in love. I saw this movie when I was in high school. It was terrible! I would not recommend that anyone see this movie.

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Vocabulary and Idiom Review

A. Choose the best word or phrase to fill in the blank.

1. Each of the computer's _____ is sold separately.
a. means b. missions c. modules d. muscles

2. In this class, we will explore the creative _____ of watercolors.
a. integrity b. affordability c. reliability d. versatility

3. Please do not put heavy _____ on this shelf.
a. approaches b. designs c. grounds d. objects

4. The _____ was very easy. Even a child could do it.
a. crack b. sibling c. task d. tool

5. The old woman had difficulty _____ her great-grandchildren's names.
a. exploring b. failing c. recalling d. thriving

6. We won't know the effects on people living in _____ for a long time.
a. brake b. planet c. sequence d. space

7. What kind of _____ sports did you play in high school?
a. effective b. necessary c. recent d. recreational

B. Choose the correct form of the word to fill in the blank.

8. New homes in this area are very _____ right now.
a. affordability b. afford c. affordable

9. We had to write an essay about the life of a famous _____.
a. explorer b. exploration c. exploring

10. What is the most _____ way to clean a car's engine?
a. effect b. effective c. effectively

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