LIVING IN SPACE

4B

Stephen Hawking, one of the world's most important scientists, believes that to **survive**, humans must move into space: "Once we **spread out** into space and establish **independent** colonies, our future should be safe," he says.

Today, the European Union, India, China, Russia, and Japan are all planning to send astronauts back to Earth's closest **neighbor**: the moon. Some of these countries want to create space stations there between 2020 and 2030. These stations will prepare humans to visit and later live on Mars or other Earthlike planets.

Robert Zubrin, a rocket scientist, thinks humans should colonize space. He wants to start with Mars. Why? He thinks sending people to Mars will allow us to learn a lot—for example, about the ability of humans to live in a very different environment. Then we can eventually create new human societies on other planets. In addition, any **advances** we make in the fields of science, technology, **medicine**, and health will also **benefit** us here on Earth.

SpaceX is a company that builds rockets. Its owner, Elon Musk, also believes we should colonize Mars, but he doesn't want just one small colony. He doesn't want to send just "one little **mission**;" he would like to send millions of people.

Not everyone thinks sending humans into space is a smart idea. Many say it's too expensive, even if it's just a short **journey**. And most space trips are not short. A one-way trip to Mars, for example, would take about six months. People traveling this kind of distance face many health problems. Also, these first people would find life extremely difficult out in space. On the moon's **surface**, for example, the sun's rays[1] are very dangerous. People would have to stay indoors most of the time.

Despite these concerns, sending people into space seems certain. In the future, we might see lunar[2] cities or even new human cultures on other planets. First stop: the moon.



Neil Armstrong, the first astronaut to walk on the surface of the moon

1 The **sun's rays** are narrow beams of light from the sun.
2 **Lunar** means "related to the moon."

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Reading Comprehension

Multiple Choice. Choose the best answer for each question.

Purpose

1. What is the main purpose of this passage?
   a. to give reasons for and against space colonization
   b. to describe what life would be like on the moon
   c. to explain the history of human space travel
   d. to compare the environments of Mars and the moon

Reference

2. What does *our* in Stephen Hawking's quote *our future should be safe* (line 4) refer to?
   a. colonies'
   b. scientists'
   c. humans'
   d. astronauts'

Detail

3. Between 2020 and 2030, some countries plan to send astronauts to _____.
   a. Mars
   b. other Earthlike planets
   c. the moon
   d. another solar system

Detail

4. Why are some countries planning to create lunar space stations?
   a. to find out about the moon's surface
   b. to lower Earth's population
   c. to grow food for humans on Earth
   d. to prepare humans to live on other planets

Detail

5. Which reason for living in space is NOT mentioned?
   a. We can learn if humans can live in a very different environment.
   b. We can create human societies on other planets.
   c. We can search for life on other planets.
   d. We can benefit from scientific advances.

Main Idea

6. Which of the following is the main idea of the fifth paragraph?
   a. There are reasons not to send humans to space.
   b. Travel to space is very expensive.
   c. The sun's rays are dangerous for humans.
   d. People living on the moon will need to stay indoors.

Paraphrase

7. What does *First stop: the moon* mean in the last line?
   a. Everybody wants to go to the moon first.
   b. Mars's moon is the best place to have a human colony.
   c. All spaceships to other planets will stop at the moon first.
   d. The first human colony in space will likely be on the moon.



Did You Know?

The meals astronauts eat in space include food such as pasta and chocolate cake or, for Japanese astronauts, ramen noodles.

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Identifying Reasons (2)

A reading text will sometimes contain arguments for and against an idea. It can be useful to identify and list all the reasons for and against an idea. This can help you form your own opinion on a particular topic.

A. Analyzing. Look back at the reading on page 57. Read the third paragraph and identify the main idea of the paragraph. Then underline the reasons that support the main idea.

B. Completion. Now read the fifth paragraph of the reading on page 57. Complete the diagram below by writing the reasons in the boxes.



Critical Thinking Discuss with a partner. Do you agree with Elon Musk that we should send millions of people to Mars? Why or why not? What do you think would be the most difficult thing about living in a colony in space?

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Vocabulary Practice

A. Matching. Read the information and match each word in **red** with its definition.

A **mission** to Mars would take at least a year—six months to get there and six months to return. This sounds like a long time, but think about it—people from Europe used to go on six-month **journeys** to Australia by ship. What's more difficult than getting to Mars is living there. People who want to live on Mars will have to find water. They would need water to **survive**, and they would probably have to take it with them from Earth. But scientists think water existed on Mars in the past and may still be under the **surface** of the planet. So, in time, the planet might be able to have water again. This would then make people on Mars more **independent** from Earth.

1. _____: able to live on one's own
2. _____: the outer part of something
3. _____: a special trip that has an aim or a goal
4. _____: trips, travels
5. _____: to stay alive

B. Words in Context. Complete each sentence with the correct answer.

1. A **neighbor** is a person who lives _____ you.
   a. near b. far from
2. A student of **medicine** probably wants to be a(n) _____.
   a. doctor b. astronaut
3. If a group of people **spreads out**, they _____.
   a. come together in one place
   b. move away from one another
4. If we make **advances** in science or technology, we _____ in those areas.
   a. do worse b. improve
5. If something **benefits** you, it _____ you.
   a. helps b. hurts

Word Link ***in-, im-*** = not: ***in****dependent*, ***im****polite*, ***im****possible*



A view of the water-ice clouds drifting over the ancient volcanoes on Mars

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VIEWING Women in Space

Before You Watch

Discussion. Read about the U.S. space shuttle program. Then discuss the questions below.

The United States' space shuttle program, which began in 1981, sent shuttles to space 135 times. This program was important because it built shuttles that allowed smooth landing and could make multiple journeys to space and back. They also allowed up to eight astronauts to travel at a time. Shuttle missions brought supplies to the International Space Station, repaired satellites, and performed experiments in space. The last space shuttle mission was in 2011.

1. What are the advantages of a shuttle over other spacecraft?
2. Why do you think the program ended?
3. Who is Sally Ride? Why do you think she is famous?



Space Shuttle > *Endeavour* launches into space.

< Astronaut Sally Ride was an American physicist who was a crew member on space shuttle *Challenger*, launched in 1983.

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While You Watch

A. Matching. Look at these events. Match them (a–g) to the years on the timeline below.

a. Eileen Collins goes into space for the first time.
b. The space shuttle program begins.
c. Sally Ride goes into space for the first time.
d. Mae Jemison goes into space.
e. NASA begins.
f. Valentina Tereshkova goes into space.
g. The first man lands on the moon.



B. Matching. Match the information to the correct person.

a. was the first woman in space
b. was in space for six days
c. was the first African American woman in space
d. was the first American woman in space
e. was the first female shuttle pilot
f. flew into space in 1985, 1999, and 2005
g. was a doctor of medicine
h. was in space for three days

Eileen Collins	☐ ☐	**Mae Jemison**	☐ ☐
Sally Ride	☐ ☐	**Valentina Tereshkova**	☐ ☐

After You Watch

Discussion. Look at these other famous "space firsts." Then discuss the questions below with a partner.

1957 first animal in space (Laika the dog)
1959 first man-made object to land on moon (Lunar 2 probe)
1961 first person in space (Yuri Gagarin)
1965 first spacewalk (Alexei Leonov)
1976 first man-made object on Mars (Viking probes I and II)
1992 first married couple in space (Mark Lee and Jan Davis)
2013 first music video filmed in space (Chris Hadfield's *Space Oddity*)

1. Which of these "firsts" do you think was the greatest achievement? Why?
2. What other "space firsts" do you think will happen in the next 50 years? 100 years?

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