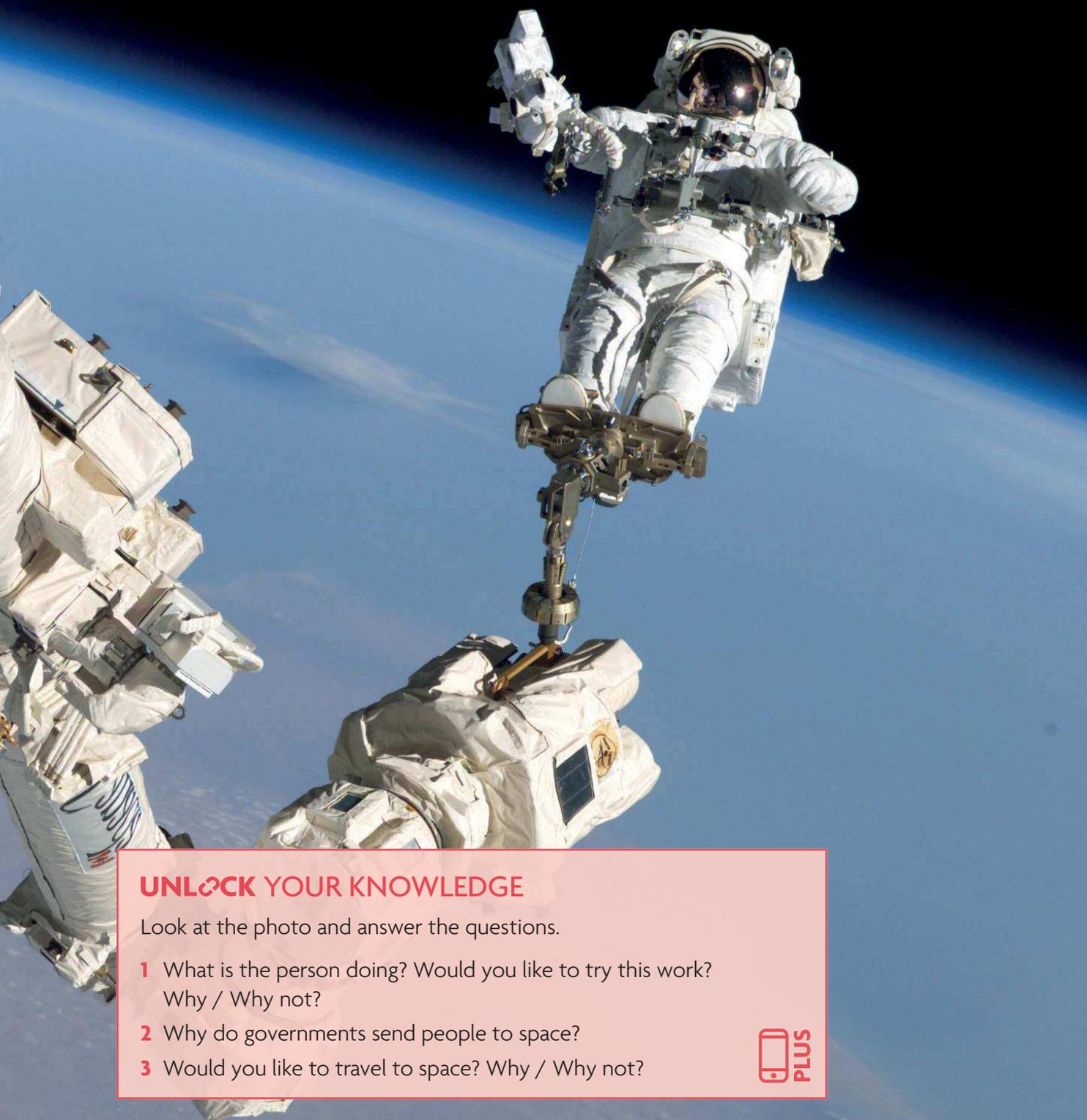


THE UNIVERSE

UNIT 8

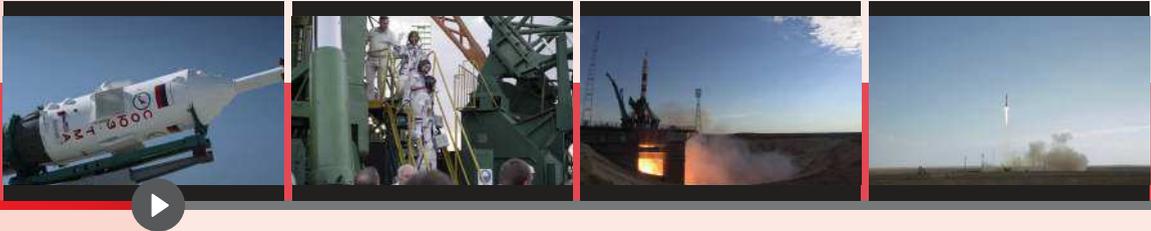
**UNLOCK YOUR KNOWLEDGE**

Look at the photo and answer the questions.

- 1 What is the person doing? Would you like to try this work?
Why / Why not?
- 2 Why do governments send people to space?
- 3 Would you like to travel to space? Why / Why not?



WATCH AND LISTEN

ACTIVATING YOUR
KNOWLEDGE

PREPARING TO WATCH

1 Work with a partner and answer the questions.

- 1 How do people usually get to work when they live far from their workplace?
- 2 Why might people live far from their workplace?
- 3 What are some unusual offices or workplaces?

2 You are going to watch a video about a woman who travelled to space for work. Write five adjectives and five nouns to describe a trip to space.

Adjectives: _____, _____, _____, _____, _____

Nouns: _____, _____, _____, _____, _____

GLOSSARY

astronaut (n) someone who travels to and works in space

International Space Station (n) the name of an international spacecraft where astronauts work on projects

rocket (n) a vehicle for travelling to space

capsule (n) the part of the rocket where the astronauts are

cosmonaut (n) an astronaut from Russia

blast off (phr v) to leave the ground; for example, when a spacecraft or rocket blasts off, it leaves the ground.

WHILE WATCHING

3  Watch the video. Answer the questions.

1 What does Sunita Williams do?

2 What is the name of her office in space?

3 How did she get there?

4 What was not a problem when she went there?

5 What took longer, her trip to space or her drive to work?

4  Watch again. Complete the sentences with the correct numbers.

1 It takes Sunita Williams _____ minutes to drive to the office.

2 She drives her car _____ miles to the office in Houston, Texas.

3 She spent _____ months in space.

4 The trip to space was _____ miles, straight up.

5 The trip took _____ minutes.

5 Correct the mistakes in the student's notes. Compare your answers with a partner.

1 The rocket is American.

2 The trip took double the time it takes her to drive to work.

3 She travelled in a big capsule.

4 She went with a Russian cosmonaut and a Korean astronaut.

5 They rode the elevator to the bottom.

DISCUSSION

6 Work with a partner. Discuss the questions. Explain your answers.

1 What are the dangers of travelling to space?

2 What kind of person works in space?

3 What is 'space tourism'? How do you feel about it?

UNDERSTANDING
MAIN IDEAS

UNDERSTANDING
DETAIL

READING

READING 1

UNDERSTANDING
KEY VOCABULARY

PREPARING TO READ

1 Read the sentences (1–7). Write the correct form of the words in bold next to the definitions (a–g).

1 Mariam loves to **explore** new places. Her dream is to go into space.

2 There were many **advances** in science and medicine during the last century. The speed of change was amazing.

3 Astronauts have not set foot **beyond** the moon, but one day soon they may go to planets that are farther away.

4 It is important for an **entrepreneur** to understand that they might lose all of their money if their business fails.

5 The rocket **crashed** when it was landing. Luckily, the people inside were not hurt.

6 Tesla is a **private** company. The government does not run it.

7 Some people don't think we should use **public** money, like taxes, to pay for space travel. They think companies should pay for it.

a _____ (n) someone who starts their own business

b _____ (n) progress in the development or improvement of something

c _____ (adj) related to money or services controlled or supplied by a person or a company and not by the government

d _____ (v) to travel to a new place to learn about it

e _____ (prep) on the farther side of; at a farther distance than

f _____ (v) to hit something by accident, especially in a vehicle

g _____ (adj) related to money or services controlled or supplied by the government and not by a person or a company

2 You are going to read an article about space travel. Before you read, discuss the questions with a partner.

1 Who pays for space exploration?

2 Do you think people will ever go on holiday in space? Why / Why not?

USING YOUR
KNOWLEDGE

The rise of commercial¹ space travel



Elon Musk and Dragon

- In 1957, the Soviet Union sent *Sputnik 1* into space. It was the first successful spacecraft to orbit² the Earth, and it started the time period known as the Space Age. A short time later in the US, the National Aeronautics Space Administration (NASA) successfully sent another spacecraft, *Explorer 1*, into space. In the years that followed, incredible **advances** were made. Astronauts orbited the Earth and men walked on the moon. The world, it seemed, wanted to learn what was **beyond** Earth.
- Today, space exploration continues, and governments still compete with one another to make new discoveries. In 2012, NASA landed its unmanned³ spacecraft *Curiosity* on Mars in order to collect information about the planet. In 2016, Europe and Russia worked together and sent a spacecraft to Mars. China and India are also working on similar projects. However, there has been one big change: **private** companies, instead of **public** government organizations, are entering the Space Race⁴.
- SpaceX has been very successful in commercial space travel. They designed the spacecraft *Dragon* in order to deliver supplies to the International Space Station (ISS). In 2012, *Dragon* was the first commercial spacecraft in history to do that. Elon Musk, the man who started the company, has dreams that go beyond making deliveries. He hopes that SpaceX will be able to send people to Mars by 2025.

- Another **entrepreneur** who supports commercial space travel is Sir Richard Branson. He started a private company called Virgin Galactic. Their goal is to open space travel to everyone. The company has sold almost 700 future trips to space, at the high cost of \$250,000 per person. Those future space tourists come from countries all over the world and are all different ages.
- Private companies are lucky in one way. They don't have to wait for money from the government like NASA does. However, that doesn't mean that setbacks⁵ and accidents don't happen. In 2014, Virgin Galactic's *VSS Enterprise* **crashed** in the Mojave Desert in the US during a test flight. The 39-year-old pilot, Michael Alsbury, was killed. In 2016, a SpaceX spacecraft that was going to the ISS exploded on the launch pad in Cape Canaveral, Florida. No one was hurt, but important supplies were lost.
- The race to **explore** the universe continues and many private companies are competing. Some of those companies want to take people to the moon and back someday. Others want to take people to Mars. The possibilities are endless. Maybe in our lifetime, those dreams will come true.



Sir Richard Branson and a Virgin Galactic spacecraft

¹commercial (adj) with the purpose of making money

²orbit (v) to travel around a planet or star

³unmanned (adj) without people to operate something

⁴Space Race (n) the competition between countries to make advances in the field of space exploration

⁵setbacks (n) problems that make something happen later or more slowly than it should

READING FOR
MAIN IDEAS

READING FOR DETAIL

WHILE READING

3 Read the text on page 173 and answer the questions.

- 1 What is the Space Age?
- 2 What are countries competing with one another for?
- 3 What are some goals of future space travel?
- 4 What is one difference between public and private companies?

4 Read the statements. Write *T* (true) or *F* (false). Then correct the false statements.

- _____ 1 NASA sent *Sputnik 1* into space, and it was the first successful spacecraft to orbit the Earth.
- _____ 2 Entrepreneurs like Elon Musk and Sir Richard Branson have to wait for government money in order to build new spacecraft.
- _____ 3 In 2016, a SpaceX spacecraft exploded in Cape Canaveral, Florida, and killed its pilot.
- _____ 4 Virgin Galactic has sold nearly 700 future trips to space.
- _____ 5 The first commercial spacecraft to deliver goods to the International Space Station was called *Dragon*.

READING BETWEEN THE LINES

SKILLS

Identifying the author's purpose

Authors write in order to inform, explain, entertain or persuade readers. The author's purpose may be understood by his or her use of key words, tone and language in the text. Good readers identify why a text was written. The author's purpose may be stated clearly in the text, or it may have to be inferred.

IDENTIFYING
PURPOSE

5 Read the text on page 173 again. Circle the correct answers.

- 1 The purpose of the text is to ...
 - a persuade readers that commercial space travel is necessary.
 - b inform readers about the advances in commercial space travel.
 - c entertain readers about the possibility of life on Mars.
- 2 You could find the text in ...
 - a a magazine.
 - b a textbook.
 - c a science fiction novel.
- 3 The author is ...
 - a analyzing commercial space travel.
 - b describing commercial space travel.
 - c questioning the benefits of commercial space travel.

DISCUSSION

- 6 Discuss the questions with a partner.
- 1 Would you pay a lot of money to be a space tourist? Why / Why not?
 - 2 Why might some people want to leave Earth and live on Mars?

READING 2

PREPARING TO READ

- 1 You are going to read about life on other planets. Before you read, circle the best definition (a or b) for each word in bold.
- 1 I often **wonder** if people will travel to Mars one day. Maybe NASA will send someone there in the next 10 or 15 years.
 - a think about something and try to understand it
 - b not believe something
 - 2 My essay is weak because I didn't **support** my ideas with expert opinions. I should find more research to add to my essay.
 - a think of more topics to write about
 - b help show that something is true
 - 3 A lot of **evidence** shows that Mars once had flowing water.
 - a opinions that people have about a topic
 - b something that makes you believe something is true
 - 4 Scientists have been studying space for many years. Some think there is life on other planets, but no one can **prove** it.
 - a show that something is true
 - b ask questions about something
 - 5 Life can't **exist** without air and water. For that reason, Earth is the perfect planet for life.
 - a be real, alive or present
 - b change and improve
 - 6 Because it was so difficult, Elise thought it was **unlikely** that she would pass her Astronomy exam.
 - a expected to happen; probable
 - b not expected to happen; not probable
 - 7 Astronauts have to train a lot in order to prepare for the **conditions** they'll face in space, such as very hot and very cold temperatures.
 - a the location of something
 - b the situation in which people live, work or do things
 - 8 On **particular** nights, you can see the brightest planets when you look at the sky. That only happens when the sky is clear.
 - a used to talk about one thing or person and not others
 - b many different things or people, not just one

UNDERSTANDING KEY VOCABULARY



SKIMMING

2 Skim the text on page 177. What type of text is it?

- a a story
- b an essay
- c a newspaper article

WHILE READING

3 Read the text and write the number of the paragraph (1–4) where the author mentions each idea (a–d).

- a There is not enough evidence to prove that Kepler 22b has life.
Paragraph: _____
- b Earth is the only planet with the right conditions for life.
Paragraph: _____
- c There are arguments for and against the idea that life exists on other planets. Paragraph: _____
- d It is unlikely that there is life on another planet, because the conditions for life to exist are too particular. Paragraph: _____

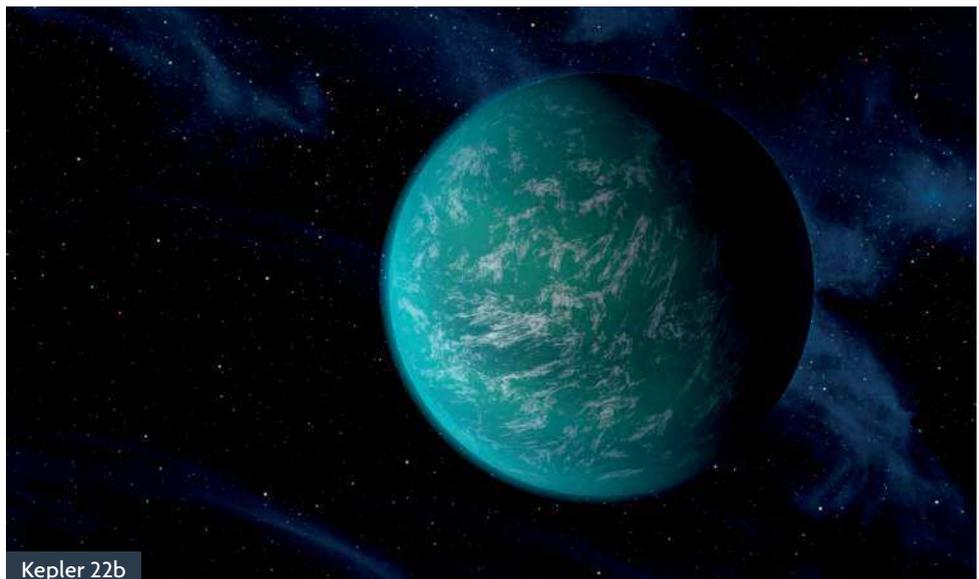
READING FOR DETAIL

4 Answer the questions, using the information in the text.

- 1 How many solar systems are there in the universe?

- 2 What is the name of the telescope that discovers new planets?

- 3 What is Kepler 22b? _____
- 4 Which university wrote a report saying that it is unlikely that there is life on other planets? _____
- 5 What does the report say we need before we can know if there is life on other planets? _____



Kepler 22b

Life on other planets

1 For many years, people have **wondered** whether we are the only living things in the universe. Some scientists believe that there must be life on other planets because the universe is so big. However, it is **unlikely** that there is life on other planets because planets need a very specific environment for life to start. In the end, there are no facts that **support** the idea of life on other planets.

2 First of all, it is true that the universe is huge. It has billions of stars and thousands of solar systems. As of 2016, experts using the very powerful Kepler telescope¹ have found more than 2,300 planets in orbit around stars. A lot of these planets are similar to Earth. In fact, a number of scientists believe that one of these planets, named Kepler 22b, has the right **conditions** – the right atmosphere² and temperature – to support life. However, there is no **evidence** that there is life on Kepler 22b. Experts with the best technology can see no signs of life there. Until there is hard evidence, we cannot use Kepler 22b to support the idea of life on other planets.

3 A planet needs very **particular** conditions to support life. A planet with life would need to have water, the right temperature and

the right mix of chemicals in the atmosphere. Earth has the perfect conditions for life, and it is very unlikely that another planet has exactly the same environment as Earth. In addition, although scientists believe that life might **exist** on other planets, they have never found evidence to **prove** it. A recent report from Princeton University suggests that it is highly unlikely that there is life on other planets. The researchers believe that we don't have enough scientific evidence to decide if there is life on other planets. They say that just because conditions similar to Earth exist on other planets, it doesn't mean that life exists there.

4 In conclusion, I do not believe that there is life on other planets. Although the universe is very big, a planet with life needs very special conditions. Earth has exactly the right conditions for life. It is not too hot or too cold. It has water, air and the right chemicals. I do not think that any other planets could have exactly the same conditions as Earth. Therefore, I do not think that there could be life on other planets.

¹**telescope** (n) a piece of equipment, in the shape of a tube, that makes things that are far away look bigger or nearer

²**atmosphere** (n) the layer of gases around a planet

MAKING INFERENCES

DISTINGUISHING
FACT FROM
OPINIONIDENTIFYING
PURPOSE

SYNTHESIZING



READING BETWEEN THE LINES

- 5 Why do you think Kepler 22b was given its name?
- 6 Read the sentences from the text. Which are facts and which are opinions? Write *F* (fact) or *O* (opinion).
- There must be life on other planets. _____
 - The universe has billions of stars and thousands of solar systems. _____
 - It is highly unlikely that there is life on other planets. _____
 - A planet needs very particular conditions to support life. _____
- 7 Read the questions (1–3) and circle the correct answers (a–c).
- What is the author's main purpose?
 - to entertain readers
 - to make readers agree with his or her opinion
 - to inform readers
 - What does the author believe?
 - The universe is so big that there must be life on other planets.
 - Life probably doesn't exist on other planets.
 - Life most likely exists on other planets; we just have to find it.
 - Why does the author include information from a recent report from Princeton University?
 - to prove that experts agree with his or her opinion
 - to show that there are two sides to the argument
 - to prove that life exists on other planets

DISCUSSION

- 8 Space exploration has led to many inventions. With a partner, rank these inventions in order of importance from 1 (the most important) to 7 (the least important).
- | | |
|---------------------------|---------------------------|
| a microcomputers _____ | e electric cars _____ |
| b GPS navigation _____ | f robotic arms _____ |
| c satellite TV _____ | g freeze-dried food _____ |
| d weather forecasts _____ | |

- 9 Use information from Reading 1 and Reading 2 to answer the questions.
- Will private companies make it possible for tourists to go to the moon or to explore planets like Mars or Kepler 22b? Why / Why not?
 - Will private companies help us learn more about other planets and their environments? Why / Why not?