UNIT 2 WATCH THIS SPACE . . .

IN THIS UNIT YOU

- learn language to talk about innovation inspired by space exploration
- listen to people from different countries debating the value of space exploration
- write an outline for an essay about life on other planets
- read about how a science fiction series influenced a modern invention
- talk about the possibility of life on other planets
- learn about evaluating explanations
- watch a video about the search for life on other planets

WRITING
outlining

When you have to write a paragraph or an essay, do you organise what you are going to say? Do you organise your ideas mentally or do you make a written plan?

LISTENING
understanding native English speakers

Do you find it difficult to understand native English speakers from certain countries or regions? If so, which ones?

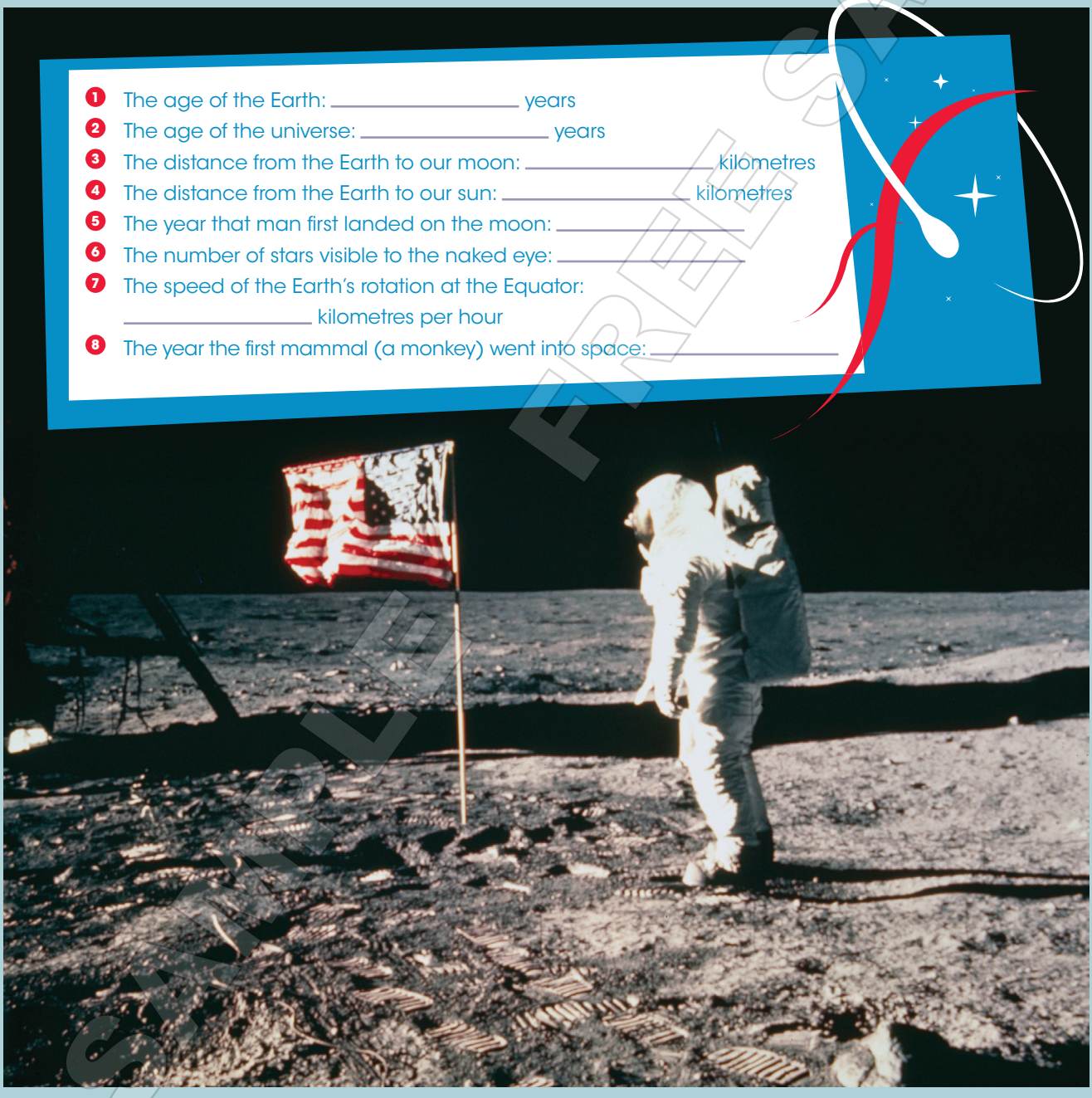
LIFE SKILLS
STUDY & LEARNING

evaluating explanations

Do you usually accept or question explanations that you read or hear …

- in a book?
- from a friend?
- from a parent or older relative?
- on a website such as Wikipedia?
- in a magazine or newspaper?
- from a teacher or professor?

A How well do you know the universe? Guess the answers to the questions. Then check the answers at the bottom of page 30. Compare your answers in pairs. Whose answers were the closest?



1. The age of the Earth: _____ years
2. The age of the universe: _____ years
3. The distance from the Earth to our moon: _____ kilometres
4. The distance from the Earth to our sun: _____ kilometres
5. The year that man first landed on the moon: _____
6. The number of stars visible to the naked eye: _____
7. The speed of the Earth's rotation at the Equator: _____ kilometres per hour
8. The year the first mammal (a monkey) went into space: _____

B Decide which of the statements you agree with and explain why.

Facts like the ones in Exercise A are irrelevant to everyday life. It doesn't matter if people don't have any idea of the answers.

Knowing facts like the ones in Exercise A is important. It gives you a sense of perspective and helps you understand your place in the universe.

READING: an online article

A **Read the article. What is the connection between space, science fiction and mobile phones?**

How Science Fiction Inspired Innovation

[1] Martin Cooper led the team at Motorola that developed the world's first handheld mobile phone. In the early 1970s, Cooper was worried that Motorola's great rival, AT&T, was gaining a lead in car phone technology and was lobbying the Federal Communications Commission (FCC) for frequency space for its car phone network. Despite the fact that AT&T was larger than Motorola and had much greater research resources, Cooper wanted to challenge and, if possible, to leapfrog the giant. He has said that watching Captain Kirk using his communicator on the television programme *Star Trek* inspired him with a stunning idea – to develop a handheld mobile phone. He and his team took only 90 days in 1973 to create the first portable cellular 800 MHz phone prototype.

[2] Martin Cooper was not just a clever engineer. He also understood the power of public relations. He called a press conference. On 3rd April 1973, on Sixth Avenue in New York City, in front of a group of amazed journalists, Cooper made the first public phone call from a prototype handheld mobile phone. He made that first call to Joel Engel, head of research at AT&T Bell Labs, to inform his rivals that they were well behind. He then allowed some of the reporters to make phone calls to anyone of their choosing to prove how the mobile phone worked. The resulting publicity was a sensation.

[3] Cooper later said, 'As I walked down the street while talking on the phone, sophisticated New Yorkers gaped at the sight of someone actually moving around while making a phone call. Remember that in 1973, there weren't cordless telephones, let alone mobile phones. I made numerous calls, including one where I crossed the street while talking to a New York radio reporter – probably one of the more dangerous things I have ever done in my life.'

[4] The original Motorola DynaTAC handset weighed a hefty one kilogram and had very restricted talk time. Cooper later joked, 'The battery lifetime was 20 minutes, but that wasn't really a big problem because you couldn't hold the phone up for that long.' Because of the infrastructure needed, it took a full ten years before the first commercial mobile phone, the DynaTAC 8000X, was launched in 1983. This phone weighed half a kilogram, had 30 minutes of battery life and was priced at $3,995 – about $9,300 in today's prices.

[5] The Star Trek series foreshadowed many other innovative ideas and inspired other inventors. Ed Roberts, who invented the first home computer, the Altair 8800, named it after the Altair Solar System in a *Star Trek* episode.

www.destination-innovation.com

B **VOCABULARY: BUSINESS AND INNOVATION**

Write the underlined words from the text in the definitions. Change verbs to their base form where necessary.

1 _____: (*v.*) to give someone an idea or enthusiasm for doing something
2 _____: (*n.*) the activity of creating a good opinion of a person, company or product
3 _____: (*v.*) to try to influence politicians or people in authority on a particular subject
4 _____: (*n.*) the first form or example of something new
5 _____: (*n.*) a very large and successful company
6 _____: (*v.*) to become more successful or popular than competitors
7 _____: (*n.*) a set of systems
8 _____: (*n.*) an official meeting with reporters
9 _____: (*n.*) a person, team or business that competes with another
10 _____: (*v.*) to start selling a new product or service to the public; to send a spacecraft, satellite or other object into space

C VOCABULARY: BUSINESS AND INNOVATION

Work in small groups. Discuss these questions.

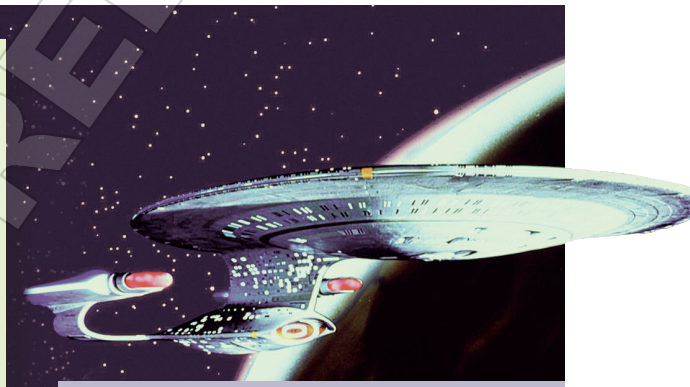
1 Have you heard of AT&T or Motorola? Are these companies still giants in the mobile phone industry? Which rival companies have gained a lead in the market?
2 When a company is launching a new product, what kinds of public relations activities do you think are most effective for inspiring young adults to buy it?
3 Can you think of any other inventions that were inspired by science fiction? What kind of new prototypes do you think we might see in the next decade?

GRAMMAR: future passive

A LANGUAGE IN CONTEXT Read the text. What is the main idea?

a) Science-fiction inventions are interesting but not applicable in the real world.
b) Science fiction takes some of its ideas from things in the real world.
c) Some science-fiction inventions can be used as ideas for real inventions.

Some really cool things have been created for science-fiction films. Could some of those things actually be invented at some point in the future? Well, did you see the force field, the invisible defence, that protected the Starship Enterprise from enemy attacks in *Star Trek*? British military scientists are now working to create force fields to protect their armoured vehicles! Short bursts of electrical energy will be activated around the vehicles to make it impossible for bullets to reach them. And what about those robot soldiers in *Avatar*? Apparently, millions of dollars will be spent by the US Department of Defence to develop combat robots. These are just two examples of science-fiction items that may be developed for use in the real world in the very near future!



NOTICE!

1 Underline all the examples of the passive in the text.
2 Draw two lines under all the modal verbs.
3 Which of the passive phrases refer to future possibilities? Which are more definite predictions?

B ANALYSE Look at the text in Exercise A again.

Form Choose the correct option to complete the rule.

The future passive is formed with …

a) *will/may/might/could* + *be* + past participle.
b) *will/may/might/could* + base form.

C PRACTISE Rewrite the active sentences using the future passive. Then look at the pairs of sentences again. Is the active or passive form more suitable? Are both equally suitable? Why? Discuss in pairs.

1 They will invent personal spaceships in the next century.

_____

2 We could learn a lot from future science-fiction films.

_____

3 They won't send astronauts to Mars in my lifetime.

_____

4 NASA might train astronauts at a lunar base.

_____

5 Do you think people will ever colonise other planets?

_____

WHAT'S RIGHT?

◯ Force fields will use by the British military.
◯ Force fields will be used by the British military.

D NOW YOU DO IT Work in groups. Make a list of things related to space that you think will be done in the next 50 years. Then share your ideas with the class.

We think the moon will be colonised because there are valuable minerals there.

LISTENING: understanding native English speakers

English speakers from different countries or regions might speak with different accents. Pay attention to an unfamiliar accent when you hear one and find out where it comes from. The more familiar you are with a range of accents, the better prepared you are to communicate with many different people.

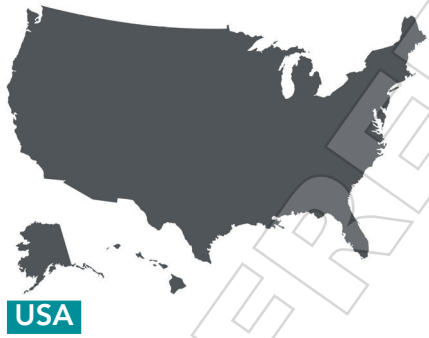
A 1.06 Listen to the people about to attend a book launch. Match the accents that sound the same.

Speaker 1
Speaker 2
Speaker 3
Speaker 4
Speaker 5
Speaker 6

B Listen again and match the speakers to the countries they are from.

India

1 Speakers ___ and ___



USA

2 Speakers ___ and ___

Australia

3 Speakers ___ and ___

C 1.07 Now listen to the Q & A session after the book launch. Tick whether each speaker is *for* or *against* space exploration. Write the main reason for each person's opinion.

	For	Against	Main reason
Speaker 1	☐	☐	
Speaker 2	☐	☐	
Speaker 3	☐	☐	
Speaker 4	☐	☐	
Speaker 5	☐	☐	
Speaker 6	☐	☐	

D VOCABULARY: NEGATIVE PREFIXES: *UN-, IN-, IM-*

Complete the table with the correct forms of the words from the box. Then work in pairs and add any other examples you know.

acceptable accurate available aware believable capable certain measurable patient perfect practical probable significant sufficient

Negative adjectives with *im-*	Negative adjectives with *in-*	Negative adjectives with *un-*
impossible	*insufficient*	*unknown*

E VOCABULARY: NEGATIVE PREFIXES: *UN-, IN-, IM-*

Work in groups. Discuss whether you think we should continue to explore space. Use reasons from the audio or your own ideas. Include as many words from Exercise D as you can.

GRAMMAR: conditional conjunctions

A LANGUAGE IN CONTEXT Read the blog entry. What is the person's general opinion of the possibility of finding life on other planets?

Science Web

Adriano87, Turin, Italy → *reply*

I think we have to be very careful in our search for intelligent life on other planets (1) **in case** it's not what we expect. It'll all be fine (2) **as long as** any aliens we contact are peace-loving. (3) **Since** we are uncertain of who or what is out there, I don't think we should be too welcoming. We might be putting the human race in danger (4) **unless** we protect ourselves. However, I do recognise that it could be an amazing cultural experience (5) **provided that** we're careful. Invasion from space might be improbable, but we should make sure we're prepared (6) **just in case** it actually happens!

B ANALYSE Look at the blog entry in Exercise A again.

Function **Match the words and phrases in bold (1–6) to the correct meanings (a–d). Two of the meanings are used twice.**

a) except if ☐
b) only if ☐☐
c) because it is true that ☐
d) because it is possible that ☐☐

Form **Choose the correct option to complete the rule.**

Conditional conjunctions are followed by …

a) a clause (subject + verb). b) a noun.

C PRACTISE **Complete each sentence with one word or phrase from Exercise A.**

1 We'll never find life on other planets _____ we look for it.
2 We need to be careful about alien encounters _____ they're aggressive.
3 We could learn a lot from an alien culture _____ we could understand each other.
4 We need to be ready _____ an asteroid or comet is heading towards the Earth.
5 Any message from the stars would take years to reach us _____ they're so far away.
6 The space programme will continue _____ there is enough money for it.

D NOW YOU DO IT **Work in groups. What do you think will/should happen with space programmes in the future? Discuss your ideas with your group.**

Provided that …, we will probably …
Unless we …, we might …
As long as …, we should be able to …
We should … in case …
Since …, I think we should …

NOTICE!

Read the three sentences. Which one has a different meaning?

a) We might be putting the human race in danger unless we protect ourselves.
b) We might be putting the human race in danger if we protect ourselves.
c) We might be putting the human race in danger if we don't protect ourselves.

WHAT'S RIGHT?

◯ Aliens won't attack us unless we don't attack them.
◯ Aliens won't attack us if we don't attack them.
◯ Aliens won't attack us unless we attack them.

PRONUNCIATION: contrastive stress

A 1.08 Underline one word in each sentence to convey the meaning in italics. Then listen and check.

1 I think there may be life on other planets in our galaxy. = *But I'm uncertain.*
2 I think there may be life on other planets in our galaxy. = *But probably not in other galaxies.*
3 I think there may be life on other planets in our galaxy. = *It's not certain, but it's a real possibility.*
4 I think there may be life on other planets in our galaxy. = *But you may not think so.*
5 I think there may be life on other planets in our galaxy. = *But not on stars or other bodies in the galaxy.*

B Work in pairs. Take turns reading sentences from Exercise A. Listen for the stressed word and identify which sentence it is.

SPEAKING: talking about the possibility of life on other planets

A Read the blog entry. Make notes of the three main reasons why the writer thinks there is no life on other planets.

My Blog: **thought for the day**

IS ANYONE OUT THERE?

Print Like it! {10} Comment {3}

A lot of people say that since the universe is such a huge, immeasurable space, it's impossible that we are the only intelligent life forms. Personally, I don't agree. With our sophisticated 21st century communications and radar systems, if there were other intelligent life out there, we would have found it by now. Think of all the technology both here on Earth and on the International Space Station. If that technology hasn't detected other life forms, it's because they're not there.

Some people argue that there is definitely life out there because many people have seen UFOs (Unidentified Flying Objects). However, there has never been any proof of this. Why are there no convincing photos? Obviously, it's because the stories are not true! People like to think that we are not alone in the universe, and they use their imaginations to create all kinds of unbelievable stories. I just don't buy it.

Of course, somewhere in the universe there may be a planet similar to Earth, but so far, all the planets we have found are incapable of supporting any kind of life form. They are either huge balls of gas, like Jupiter and Saturn, or they are too hot or too cold for life to exist on them. Or there is too much or too little gravity. There are many, many factors that had to be exactly right in order for life to evolve on Earth. Maybe another planet like Earth will be formed at some point far in the future, but there are no indications that a planet like this one exists in the present.

B 1.09 Listen to an extract from an interview. Make notes of the three main reasons why the speaker thinks there is probably life on other planets.

C Decide which of the opinions you agree with more. Add any other arguments you can think of to support each view.

D **Independent Speaking**
Work in pairs. Take turns explaining whether you think life on other planets exists or not. Note your partner's main points. Then report your discussion to another pair.

WRITING: outlining

An outline is a plan of what you are going to write. Making notes of your ideas ensures that the piece of writing is organised properly and you don't forget anything important. Outlines often describe what you plan to put in each paragraph and include topics and supporting details.

A **Work in pairs. Read the essay question and the outlines written by two students. Discuss which outline you think is better and say why.**

Do you think countries should have space programmes? Why or why not?

Paragraph 1: Introduction
- countries that have space programmes
- general statement that there are arguments for and against space programmes

Paragraph 2: Arguments against space programmes
- how money should be spent on Earth
- space programme inventions that would have been invented anyway
- need for infrastructure in developing countries, not space programmes

Paragraph 3: Arguments for space programmes
- inventions that might still be unavailable without space programmes
- science and technology advances in developing countries with space programmes
- resources on other planets
- job creation due to space programmes

Paragraph 4: Conclusion
- arguments for space programmes stronger than arguments against them
- summary of main advantages of space programmes

Paragraph 1: Introduction
- history of the space programme
- my opinion of the space programme in my country

Paragraph 2: Arguments against space programmes
- amount of money spent on US space programme every year
- not all space programme inventions useful on Earth
- space programmes bad for developing countries

Paragraph 3: Arguments for space programmes
- only a few people employed by space programmes
- valuable resources on other planets
- more space programmes are needed

Paragraph 4: Conclusion
- my opinion – in favour of space programmes

Planning

- ☐ Do the points in the introduction relate to the general topic?
- ☐ Do all of the points in each section support the topic of the section?
- ☐ Are all of the points specific enough?
- ☐ Does the conclusion summarise the main ideas of the essay?

B **Work in pairs. Create an outline for the essay question.**

Do you think it is probable or improbable that life exists on other planets?

C **Work with another pair. Compare your outlines. Give each other suggestions for improving them.**

LifeSkills

EVALUATING EXPLANATIONS

- Understand the difference between correlation and causation.
- Read facts presented by the media and advertisers carefully to see if they are implying that one thing causes another.
- Evaluate explanations of the facts to decide whether claims of causation are accurate or inaccurate.

A **Read the extract from an article. In your own words, explain the difference between correlation and causation.**

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ICE CREAM CAUSES SHARK ATTACKS!

by Nathan Kane

We are surrounded by claims. Almost every day in the news you hear stories and statistics that seem to show that A causes B. There are countless examples of headlines claiming that this food causes cancer, or that food prevents it. Understanding and analysing these claims is an important part of modern life, but we rarely teach it in schools.

We need to teach people to distinguish between correlation and causation. Things 'correlate' when they happen together, but it doesn't mean that one causes the other. Let me give you an example. As ice cream sales go up, shark attacks on swimmers go up. This is a fact. So, does this fact mean that ice cream causes people to be eaten by sharks? Of course not! The real explanation is that ice cream sales go up during the summer when the weather is hotter. And people go to the beach more during warm weather, so there are more people in the water for sharks to attack. There's a correlation between the two facts, but that doesn't imply causation. They both happen at the same time, but you have to think a bit more deeply to discover the real cause behind both facts.

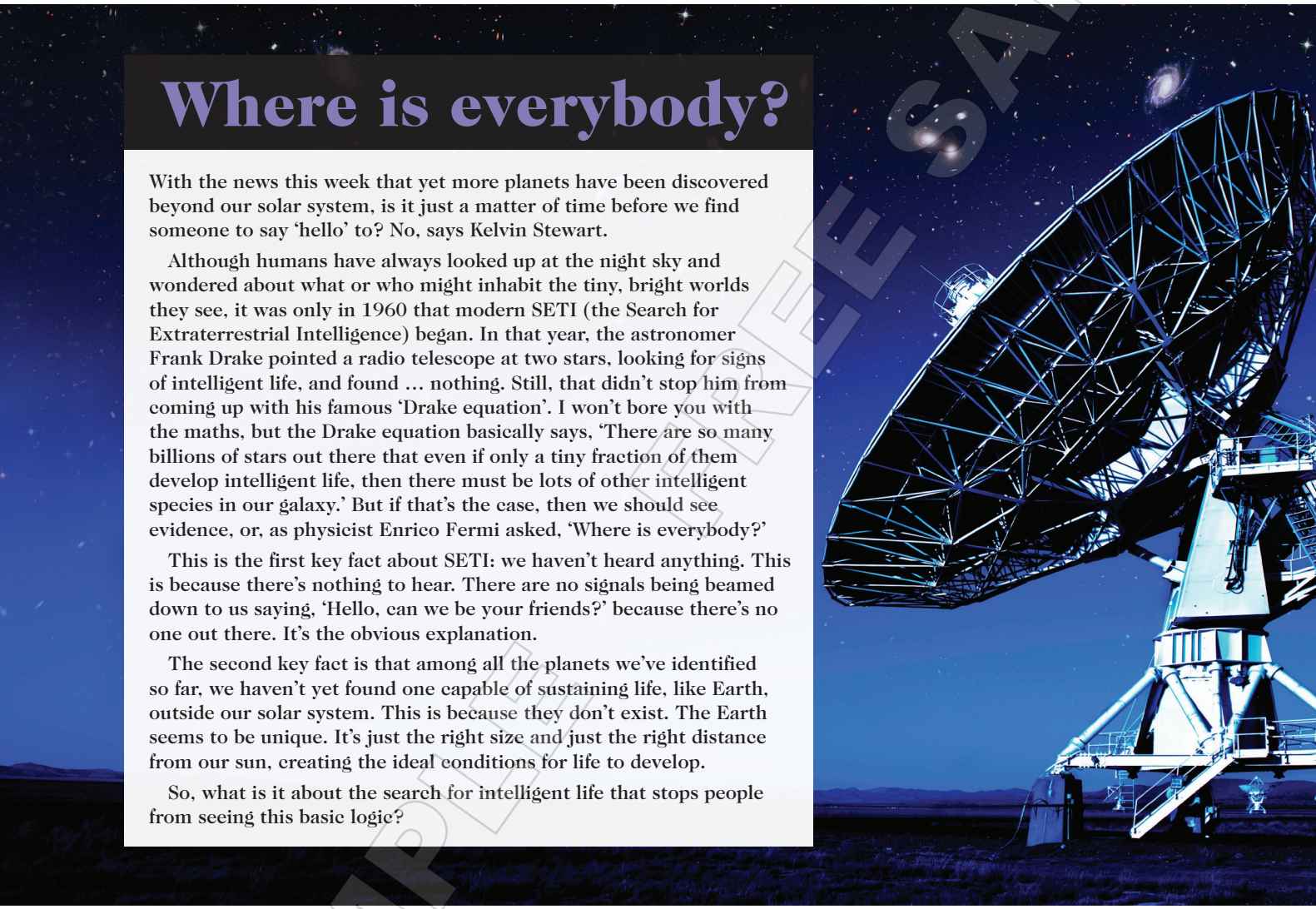
B **Read each claim and the explanation given. With your class, discuss whether you find the explanation convincing and suggest other possible explanations.**

Claim: People who play basketball are often taller than average.
Explanation: This is because you need to stretch a lot when playing the game and so you become taller.
Claim: Children with bigger hands usually write better.
Explanation: This is because having bigger feet and hands means you can move a pen more easily.
Claim: Violent criminals often watch violent films.
Explanation: This is because watching these films produces violent feelings and leads people towards crime.

HOW TO SAY IT

I think this explanation is improbable because …
This may be true, provided that …
That can't be right, since …
I think a more likely explanation is that …

C Read the extract from a webpage. Think about whether you tend to agree or disagree with the writer, and say why.



Where is everybody?

With the news this week that yet more planets have been discovered beyond our solar system, is it just a matter of time before we find someone to say 'hello' to? No, says Kelvin Stewart.

Although humans have always looked up at the night sky and wondered about what or who might inhabit the tiny, bright worlds they see, it was only in 1960 that modern SETI (the Search for Extraterrestrial Intelligence) began. In that year, the astronomer Frank Drake pointed a radio telescope at two stars, looking for signs of intelligent life, and found … nothing. Still, that didn't stop him from coming up with his famous 'Drake equation'. I won't bore you with the maths, but the Drake equation basically says, 'There are so many billions of stars out there that even if only a tiny fraction of them develop intelligent life, then there must be lots of other intelligent species in our galaxy.' But if that's the case, then we should see evidence, or, as physicist Enrico Fermi asked, 'Where is everybody?'

This is the first key fact about SETI: we haven't heard anything. This is because there's nothing to hear. There are no signals being beamed down to us saying, 'Hello, can we be your friends?' because there's no one out there. It's the obvious explanation.

The second key fact is that among all the planets we've identified so far, we haven't yet found one capable of sustaining life, like Earth, outside our solar system. This is because they don't exist. The Earth seems to be unique. It's just the right size and just the right distance from our sun, creating the ideal conditions for life to develop.

So, what is it about the search for intelligent life that stops people from seeing this basic logic?

D Work in pairs. The article states two key facts, together with explanations. For each one, discuss how convincing you find the explanation. Make a note of possible alternative explanations.

E Share your ideas with the class. Who has the most convincing explanations for the facts in the text?

F Discuss these questions.

1 What have you learnt about evaluating explanations?
2 When you read or hear an explanation for something, what makes you tend to believe it or disbelieve it?

REFLECT … How can being able to evaluate explanations be useful to you in **Work and Career** and **Self and Society**?

RESEARCH …

Look for an article about a claim that one thing is caused by another. You could look in these topic areas:

- health (e.g. 'X causes heart disease.')
- crime (e.g. 'Rise in theft caused by X.')
- education (e.g. 'X leads to better exam results.')
- lifestyle (e.g. 'Watching a lot of TV causes X.')

When you have found an article, research the topic further and decide if you think there is really causation or simply correlation. Be prepared to tell your class what you found out.

Language wrap-up

1 VOCABULARY

Complete the text with the words and phrases from the box. Make the adjectives negative by using the prefix *un-*, *in-* or *im-*. (10 points)

available certain gained a lead inspired known
launched possible practical probable sufficient

Humans have always wanted to explore **(1)** _____ places, so it is not surprising that we are fascinated by space travel. Writers like Jules Verne were **(2)** _____ to write science-fiction stories about space even though space exploration was still **(3)** _____ when they were alive because the technology for it was **(4)** _____ at that time. The 'space race' between the USA and the USSR began in the 1950s, and the Soviets **(5)** _____ when they **(6)** _____ a satellite called Sputnik in 1959. The two countries were great rivals for many years. Unfortunately, there is **(7)** _____ money to continue all of the programmes related to space exploration, so some of the programmes that were considered too **(8)** _____ have been cancelled. The future of space travel is **(9)** _____, but there is still hope that one day humans will visit other star systems, even if that seems **(10)** _____ now.

8–10 correct: I can use words for business and innovation and negative prefixes.
0–7 correct: Look again at the Vocabulary sections on pages 22, 23 and 24. **SCORE:** /10

2 GRAMMAR

Choose the correct option to complete each sentence. (12 points)

1 Astronauts receive training in case / provided that they have to deal with emergencies.
2 I don't believe life will be / has been discovered on other planets in the near future.
3 Spacecraft in the future will design / be designed to travel very long distances.
4 Space tourists might charge / be charged a lot of money to stay in a hotel on the moon!
5 We won't discover what's out there unless / if we don't continue to explore.
6 Sending a crew to Mars is possible as long as / in case we can keep them safe.
7 Do you think a war will ever fight / be fought in space?
8 NASA may send / be sent a spacecraft to explore Pluto.
9 I wonder if a colony will establish / be established on Mars in the future.
10 I'm optimistic about finding extraterrestrial life, provided that / unless we continue to invest in exploration.
11 I don't think humans could survive / be survived on any other planet.
12 New forms of space travel may invent / be invented in the next few years.

10–12 correct: I can use the future passive and conditional conjunctions.
0–9 correct: Look again at the Grammar sections on pages 23 and 25. **SCORE:** /12

Answers to quiz, page 21:

1	4.5 billion	3	384,000	5	1969	7	1670
2	14 billion	4	150 million	6	6000	8	1948

SPEAKING WORKSHOP

describing a picture

A 1.10 **Listen to someone describing a picture of a space colony. Number the main points in the order that they are mentioned from 1–5.**

___ Details about the types of buildings
___ The shape of the colony (round, oval, etc)
___ The speaker's opinions of life in a space colony
___ Information printed on the picture
___ Details about transport

B **Listen again. Then complete the sentences with the phrases from the box.**

appears to be as long as look like says that shape of similar to type of

1 The information at the top of the picture _____ the colony will float in space.
2 The _____ the colony is oval, like a giant egg.
3 There are several structures that _____ airports.
4 These things in the air are _____ cars, but they fly.
5 Many people are … riding a _____ flying bicycle!
6 This strange oval structure _____ some kind of stadium.
7 I guess living in a space colony would be OK _____ it was designed to …

C **Look at the picture of a different concept for a space colony. Make an outline to prepare a short talk describing the colony. Follow the format in the box.**

Intro: printed info on the picture
- when colony will be built
- where it will be built

General description of the colony
- The dome: shape of dome, how land under dome looks different from land outside of dome
- Description of life in colony: buildings, transport, what people are doing

Closing: your opinion of what life in a space colony will be like

Colony on Mars, to be built by 2080 and colonised by people from every country

D **Work in pairs. Use your outline to talk about the picture.**

HOW ARE YOU DOING?

- I used a logical order to describe the picture.
- I described a wide range of detail – shapes, activities, positions, etc.
- I used a variety of vocabulary.