

Impact 3 الطالب كتاب



تم تحميل هذا الملف من موقع مناهج مملكة البحرين

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تاريخ إضافة الملف على موقع المناهج: 2026-06-07 10:35:39

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المزيد من مادة
لغة انجليزية:

التواصل الاجتماعي بحسب الصف التاسع



صفحة مناهج مملكة
البحرين على
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المزيد من الملفات بحسب الصف التاسع والمادة لغة انجليزية في الفصل الثاني

فقرات لغة انجليزية للفصل الثاني

1

نماذج كتابة 2025-2026م

2

فقرات النماذج الكتابية

3

مراجعة الاختبارات الوطنية 2025-2026م

4

كراسة تدريبية شاملة لامتحانات الوطنية تغطي مهارات الكتابة كتابة إيميل أو قصة بطول 80-120 كلمة

5

impact

Impact helps teenage learners better understand themselves, each other and the world they live in.

By encouraging self-expression, global citizenship and active participation, *Impact* motivates students to explore who they are and who they want to be – all while learning English!

- National Geographic Explorers are featured as role models who embody the 21st-century skills and values teenagers need to become successful global citizens.
- Cross-curricular topics engage learners with stimulating information about the world, better preparing them for future academic success.
- Student-choice activities and projects present learners with options for language practice, allowing them to become active participants in the learning process.

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BRITISH ENGLISH

A1	A2	B1	B2
CEFR correlation			
The exit level for Impact 3 is B1+.			

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Bahrain Edition

3

impact

STUDENT'S BOOK

KINGDOM OF BAHRAIN
Ministry of Education



مملكة البحرين
وزارة التربية والتعليم

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STUDENT'S BOOK 3



**His Majesty King Hamad Bin Isa Al Khalifa
The King of Bahrain**

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impact3

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Scope and Sequence

				
	1 Who Am I? page 10	2 Misunderstood Animals page 26	3 Everybody's Doing It! page 44	4 Fashion Footprints page 60
THEME	Identity and personality	Animals in popular culture	Human and animal group behaviour	Making responsible fashion choices
VOCABULARY STRATEGY	· Suffix <i>-ous</i> · Using context	· Prefixes <i>mis-</i> and <i>un-</i> · Using a thesaurus	· Synonyms · Definitions and examples	· Suffix <i>-al</i> · Using a dictionary
SPEAKING STRATEGY	Comparing and contrasting	Expressing surprise and disbelief	Expressing cause and effect	Asking for clarification and clarifying
GRAMMAR	Question tags: Confirming information or seeking agreement <i>Alicia is friendly, isn't she?</i> Special uses of it: <i>I hate it when the alarm goes off.</i>	Modals: Speculating about the past <i>He refuses to go in the water. He might have seen a jellyfish.</i> Infinitives with and without to: <i>He doesn't want to hold lizards. Make him try it.</i>	Separable and inseparable phrasal verbs: <i>They worked out a solution.</i> Enough, too many, too much: Talking about amounts: <i>I've got enough bags, but there are not enough volunteers. We need more.</i> Modals: Making suggestions and giving advice about present and past actions <i>You shouldn't have bought that leather jacket.</i>	Present passive: Describing actions and processes <i>A lot of pesticides are used to grow cotton.</i> Modals: Making suggestions and giving advice about present and past actions <i>You shouldn't have bought that leather jacket.</i>
READING	<i>Why Am I Me?</i>	<i>Vampire Bats – The Truth Exposed!</i>	<i>Humans in Groups</i>	<i>A Passion for Fashion</i>
READING STRATEGY	Identify descriptive words	Distinguish supporting details	Look for definitions and examples	Compare and contrast
VIDEO	<i>Sanga's Solution</i>	<i>Face-to-Face with a Leopard Seal</i>	<i>Smarter by the Swarm</i>	<i>How Your T-Shirt Can Make a Difference</i>
MISSION	Get Outside! National Geographic Explorer: Sarah McNair-Landry , Adventurer/Cinematographer	Keep an Open Mind National Geographic Explorer: Jenny Daltry , Herpetologist and Conservationist	Collaborate National Geographic Explorer: Iain Couzin , Behavioural Ecologist	Make Good Choices National Geographic Explorer: Asher Jay , Creative Conservationist
WRITING	Genre: Comparison and contrast essay Focus: Compare and contrast	Genre: Process description essay Focus: Describe purpose and sequence	Genre: Personal email Focus: Give examples	Genre: Cover letter Focus: Structure a letter
PRONUNCIATION	Intonation in question tags	Modals + <i>have</i> + past participle	Pausing	<i>Shouldn't have</i> + past participle
EXPRESS YOURSELF	Creative Expression: Flash fiction <i>A Day in the Life</i> Making connections: Teen identity and misunderstood animals		Creative Expression: Poem <i>The Garb Age</i> Making connections: Fashion trends and group behaviour	

				
	5 Flying High page 78	6 New Frontiers page 94	7 Visual Stories page 112	8 Why We Explore page 128
THEME	Evolution of animal and human flight	Space exploration	Telling visual stories	Why it's important to explore
VOCABULARY STRATEGY	· Root words (<i>port</i>) · Using a dictionary	· Greek roots (<i>astro</i>) · Using a dictionary: Word parts	· Multiple-meaning words · Using a thesaurus	· Prefix <i>en-</i> · Use pronunciation
SPEAKING STRATEGY	Arguing and conceding	Speculating	Explaining a process	Hesitating or buying time when answering questions
GRAMMAR	Past perfect: Talking about the first of two actions in the past <i>Pterosaurs had already disappeared by the time humans evolved.</i> Past perfect continuous: Talking about the first of two actions in the past <i>The Wright brothers had been working on powered flight for several years.</i>	Present and past conditionals: Talking about unlikely (but possible) or impossible situations <i>If I had known there was a talk about Mars, I would have gone.</i> Adverbs: Comparing how things are done <i>The new rover travels faster than the last rover.</i>	Past passive: Describing past actions and processes <i>Many of Goya's works were created at night, by the light of a hat that had candles on it.</i> Reported speech: Describing what others say <i>She said she would save her money for art supplies.</i>	Narrative tenses: Telling a story <i>Barrington Irving had been preparing to become a pilot since he was 15.</i> Geographic use of the <i>I'm going to the Himalayas to climb Mount Everest.</i>
READING	<i>Reaching for the Sky</i>	<i>More Than a Dream</i>	<i>Bringing Stories to Life</i>	<i>The Explorer Gene</i>
READING STRATEGY	Identify sequence of events	Categorise and classify	Mark up text	Make a personal connection
VIDEO	<i>Flight of the RoboBee</i>	<i>Europa: Ocean World</i>	<i>Animation Creation</i>	<i>Why Is It Important to Explore?</i>
MISSION	Explore Your Interests National Geographic Explorer: Ryan Carney , Palaeontologist/Evolutionary Biologist	Discover the Future National Geographic Explorer: Bethany Ehlmann , Planetary Geologist	Tell Stories National Geographic Photographer: Ami Vitale	Learn by Doing National Geographic Explorer: Corey Jaskolski , Engineer/Inventor
WRITING	Genre: Classification essay Focus: Organise ideas into categories	Genre: Persuasive essay Focus: Present both sides of an argument	Genre: Multi-paragraph narrative Focus: Describe what others say	Genre: News report Focus: Include answers to the 5 Ws and How
PRONUNCIATION	Past perfect	Final <i>d</i> + <i>you</i>	Final /ə/ sound	Sounds of letter x
EXPRESS YOURSELF	Creative Expression: Film script <i>Mission: Discovery!</i> Making connections: The history of flight and space exploration		Creative Expression: Tour description <i>A Tour of Thun, Switzerland</i> Making connections: Visual stories and exploration	

Meet the Explorers



Unit 1
SARAH MCNAIR-LANDRY Adventurer/Cinematographer
Sarah McNair-Landry skied to the South Pole when she was 18. She was the youngest person to do this. But she didn't stop there. She often travels by dogsled from her home in Alaska to go on other adventures. Sarah and her brother, Eric, once kite-skied across Canada's Northwest Passage. It took them 85 days, and 200 chocolate bars!



Unit 2
JENNY DALTRY Herpetologist and Conservationist
Jenny Daltry has always loved reptiles. She collected lizards, frogs and snakes near her home when she was a child. She also volunteered at a zoo. When Jenny was 18, she travelled to India to work on a crocodile farm. There she realised she wanted to become a herpetologist: someone who studies reptiles.



Unit 5
RYAN CARNEY Palaeontologist/Evolutionary Biologist
Ryan Carney's hero is Leonardo da Vinci. Most people know that da Vinci was a painter and an architect. Did you know that he also designed flying machines? Ryan is a little like his hero. He's also an artist, and studies the evolution of flight. Ryan examines flying dinosaurs and compares them with modern-day birds using x-ray machines.



Unit 6
BETHANY EHLMANN Planetary Geologist
Bethany Ehlmann studies planets and explores our solar system and beyond. She works on the NASA Mars Rover Curiosity mission. Bethany helps Curiosity navigate to collect rocks and minerals on Mars. She hopes we can study these samples to find signs of life on Mars and on other worlds. Do you believe there's life beyond Earth?



Unit 3
IAIN COUZIN Behavioural Ecologist
Iain Couzin uses maths to study how animals behave in groups. With mathematical models, he can take a closer look at bird migrations, insect colonies and schools of fish. Iain thinks we can use this research to answer questions about our world, such as 'How do animals benefit from working in groups?' and 'Can humans learn from animal behaviour to work better in groups?'



Unit 4
ASHER JAY Creative Conservationist
Do you think about where your clothes come from? Asher Jay does! She paints, writes and designs fashions that help raise awareness for sustainability and conservation. Asher feels very connected to the environment and to all living things, even plants and bugs. That's why she wants to reduce her fashion footprint and inspire others to do the same.



Unit 7
AMI VITALE National Geographic Photographer
Ami Vitale is more than just a photographer - she's a visual storyteller. Ami has visited more than 90 countries to take photographs. She's lived in mud huts, interacted with giant pandas and travelled through war zones. Ami thinks photos have the power to tell stories and create change. Do you enjoy taking photos? What story would you like to tell?



Unit 8
COREY JASKOLSKI Engineer/Inventor
Corey Jaskolski is an engineer who creates technologies so that people can virtually explore the world. With his 360-degree camera, anyone can explore inside of King Tut's tomb without harming its artefacts or swim in the deep sea alongside the sharks without leaving home. Corey's gadgets help explorers protect what they discover. Do you use technology to explore?

Who Am I?

'If you are passionate about what you do, it makes
motivating yourself and working hard much easier.'

Sarah McNair-Landry



The Tokyo 2020 Paralympic
Games Opening Ceremony

TO START 21ST C

1. How would you describe the people in this photo?
How do you think they might describe themselves?
2. Describe yourself in five or six words.
3. What are you passionate about? Why?

- 1 On the last page, you described yourself in five or six words. Would other people use those same words to describe you? Discuss. Then listen and read. 🔊002

For teenagers, life can seem exciting and confusing at the same time, can't it? As a teenager, you're on your way to becoming an adult. It's a time of important changes and
5 important questions.

A lot of these questions are about **identity**, or who you are. You're an individual, but you're also a product of your family life, your social environment, culture and religion.
10 Your identity includes your beliefs, your values and your actions. You learnt your values from your family. Therefore, you may choose to spend more time with other people whose values and personalities are like yours.
15 That's natural.

The qualities that make you different from other people form your **personality**. If you are **enthusiastic** about meeting lots of new people, you're probably **outgoing** and **self-confident**.
20 If you get excellent marks at school, chances are you're **organised** and **responsible**. If you're **energetic** or adventurous, you might like hiking, or getting together with friends to explore a cave! If you're **optimistic**, **generous** and **patient**, you
25 might enjoy spending time with animals at a shelter, or participating in a local clean-up event.



Personality is tricky. You might assume that everyone sees you the way you see yourself, but that isn't always true. Friends
30 may laugh at your stories and think you have a great **sense of humour**, but your brother might think you're just odd. You may see yourself as **ambitious** because you're **determined** to get what you want, but others may feel you're

35 **stubborn**, or unwilling to take advice. You may feel anxious and **shy**, while other people may think you're unfriendly. You may think you're fair, but you may still seem unreasonable or unkind to a friend.

40 Understanding yourself and how others see you can really be a puzzle!

2 **LEARN NEW WORDS** Listen and repeat. 🔊003

- 3 **Work in pairs.** Make another list of five or six words that describe you, using the new vocabulary. Then make a list of five or six words that describe your partner. Compare your lists. Do you agree with your partner's description of you? Why or why not?

4 Read and write the words from the list.

adventurous	ambitious	determined	enthusiastic
optimistic	organised	outgoing	self-confident

Sarah McNair-Landy is _____ about travel, but she’s not like most tourists. She’s very _____ and goes on long expeditions to places like the North and South Poles, the Gobi Desert, the Sahara and Greenland. In 2011, Sarah and her brother, Eric, decided to kite-ski 3,300 km. (2,050 mi.) across the frozen Northwest Passage in Canada. They each took four kites – big kites for days when there wasn’t much wind, and small kites for days when the wind was very strong. They had to be very _____ before the trip to make sure they packed the right equipment. In total, they had four sledges, with about 180 kg (400 lb) of equipment. They also packed 200 bars of chocolate! It was a difficult journey due to melting ice, but Sarah was _____ that they could complete it successfully.

Some people might think Sarah is too _____ with her expeditions, but this makes her more _____ to prove them wrong.

Sarah McNair-Landry

5 LEARN NEW WORDS Listen to the words. Write each trait next to the correct example. Are these words positive or negative? Decide. 004 Then listen and repeat. 005

anxious	fair	odd	stubborn
---------	------	-----	----------

- _____ 1. You never change! Just listen to me for once.
- _____ 2. You put salt and pepper on your ice cream? Wow!
- _____ 3. I like our music teacher. In her class, everyone gets a chance to play.
- _____ 4. You worry too much. You need to relax.

6 YOU DECIDE Choose an activity. Work in pairs.

- 1. Think of a famous person. List as many descriptive words as you can about that person.
- 2. Think about teachers you’ve had and write words to describe them. Look at the positive qualities you both listed. Then work together to write a description of your ideal teacher.
- 3. Write the letters in your partner’s name down the side of a piece of paper. Write a word that describes your partner for each letter. Compare your name poems. Do you agree with your partner’s description?

MUSICAL
AMBITIOUS
RESPONSIBLE
CURIOUS
ORGANISED

SPEAKING STRATEGY 006

Comparing	Contrasting
You’re <u>outgoing</u> ? So am I!	You’re <u>shy</u> ? Not me! I’m not <u>shy</u> at all.
Just like you, I’m <u>self-confident</u> .	Unlike you, I’m <u>optimistic</u> .
We’re alike because we’re both <u>patient</u> .	I’m <u>determined</u> , but you’re just <u>stubborn</u> !

1 Listen. How do the speakers compare and contrast their younger brothers? Write the words and phrases you hear. 007

2 Read and complete the dialogue.

Dave: My friend Sam is visiting this week.
Paul: You don’t seem very happy about it.
Dave: I’m not. My mum is always saying, ‘You’re _____ your friend Sam!’
Paul: Well, are you and Sam _____ ?
Dave: No, we’re very different. _____ him, I’m active and outgoing. All he does is watch TV.
Paul: Is he funny? Optimistic? Generous, _____ you?
Dave: No way. _____ ! He never gives me anything, not even on my birthday.

3 Work in pairs. Take turns. Use a coin to move (heads = 1 space; tails = 2 spaces). Compare and contrast as instructed.

4 Work in groups. Compare and contrast some members of your family. Are you like or unlike them? Do your classmates’ family seem like or unlike your own family?



Go to page 155.

GRAMMAR 008

Question tags: Confirming information or seeking agreement

Alicia is friendly, isn't she ?	Yes. She's outgoing. You'll like her.
You're nervous about the competition, aren't you ?	I am. I'm not sure I'm ready.
Rick doesn't live near here, does he ?	No, he doesn't. He lives quite far away.
Lin also plays the flute, doesn't she ?	Yes, she does. She's really good!
Sue couldn't make herself do it, could she ?	No. She's too shy.

1 Listen. Match the questions to logical answers. Write the letter. 009

- _____ a. Yes, it was. And we finally won!
- _____ b. Yes, I have to be. I'm a teacher.
- _____ c. No, she didn't. She said she was ill.
- _____ d. He really is. He never stops!
- _____ e. Yes, she can. And the guitar, too.

2 Read. Then complete the question tags.

- Carla and Lea want to join the team, don't they?
- You're not as enthusiastic about poetry as your sister, _____?
- Greg's brothers won't be at the party, _____?
- Maria has changed a lot, _____? She's so self-confident.
- Your sisters didn't go shopping, _____?
- You would help us if Ana can't come, _____?

3 Work in pairs. Take turns forming question tags and answering them. Agree or disagree with your partner. Express your opinion.

- (name of a place) / most beautiful / place / ever
- (name of a singer) / most popular / singer / right now
- (name of an actor) / talented / actor / on TV
- (name of a video game) / your favourite / video game
- (name of a film) / exciting / film / ever

Barton Seaver is the most interesting chef around, isn't he?

Yes, he really is. He has great ideas about food.

National Geographic Fellow
Chef Barton Seaver

4 LEARN NEW WORDS Read about young chefs and listen to their conversation. 010 Then listen and repeat. 011

Everyone loves cookery programmes! The chefs are usually self-confident and energetic, but they're not always patient or organised, are they? (That's part of the fun!) They're almost always very **competitive** as they cook against each other. They want to win by making the best food they can!

On some programmes, teen chefs compete to see who's the best cook. These teen chefs can be surprisingly **co-operative**, even while they're competing. They've made friends, and they're interested in what one another is doing. Of course, one chef may be **jealous** of another chef, but in the end many of them are still **helpful** and kind to each other as they compete. They're **open-minded** enough to know that only one person can win, but all of them can be friends – and great chefs.

5 Read. Then use a question tag to comment.

- Angela really is a talented cook. I want to be like her!
You aren't feeling jealous, are you?
- Pat and Tim refused to talk to Julia, or even listen to her ideas.

- The Whitley twins have 17 tennis trophies between them.

- Sam won't join the group to help collect and recycle plastic bottles.

- Here, let me help you clean up those dishes.

1 BEFORE YOU READ Discuss in pairs. Based on the title and the photo, what do you think the reading is about? **21ST C**

2 LEARN NEW WORDS Find the words below in the reading. What do you think they mean? Look for clues in the sentences. Then listen and repeat. **012**

bossy ignore perfectionist selfish spoilt

3 WHILE YOU READ Listen and read. Notice descriptive words you think apply to you personally. **013**

Why Am I Me?



Have you ever wondered why you are the way you are? What makes you different from, say, your brothers and sisters?

5 People have asked these questions for centuries, and researchers are trying to answer them. One idea they're exploring is that birth order influences the person we become. In general, the oldest child is described as
10 confident, organised, dutiful and determined to get what he or she wants. Oldest children are seen as born leaders, people-pleasers and perfectionists. Because they're the oldest, their younger brothers and sisters sometimes see
15 them as bossy, or too willing to tell other people what to do.

The middle child may be described as being competitive in order to get more attention. They sometimes feel that their family
20 ignores them because they are in the middle. Because middle children tend to avoid conflict, they can be flexible and easygoing. They may also be seen as secretive by members of their family. They are usually more influenced by
25 their friends than by their family, perhaps because they often get more attached to their friends than their brothers and sisters.

The youngest child is described as the baby of the family. They can be spoilt by their
30 parents, who spend a lot of time with them and often give them what they want. For this reason, their brothers and sisters sometimes get jealous. Youngest children enjoy being the centre of attention, and they are seen as outgoing, open-
35 minded and likely to take risks.

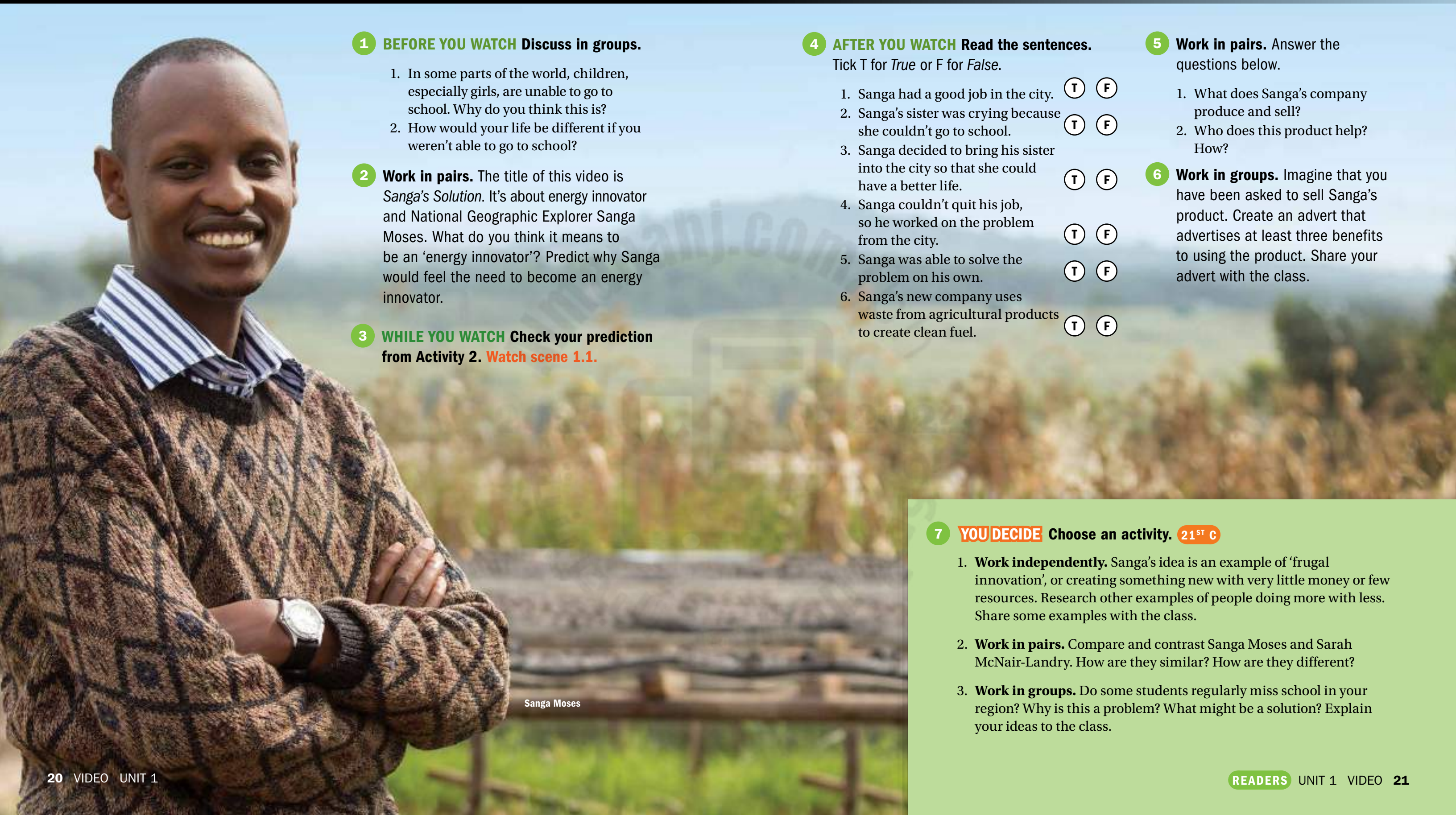
What if you're an only child? Many people think that a child with no brothers or sisters grows up wanting lots of attention. Some think they're selfish, or unwilling to share with others.
40 But because they spend so much time around adults, they're also described as confident, determined and responsible.

4 AFTER YOU READ Discuss the questions in groups.

1. What's the main idea of the reading?
2. Does birth order seem like a good way to describe personality? Why or why not?
3. Based on your personal experience, does the information in this reading seem correct? If not, why not?

5 Work in pairs. Separately, go back through the reading and underline all the words you think describe you. Then read your list to your partner. Based on your list, can your partner guess your birth order? What is it?

6 Work in groups. What other factors might affect your personality? Write two or three ideas. Briefly explain how each factor on your list might affect you. Then discuss your ideas in groups.



Sanga Moses

1 BEFORE YOU WATCH Discuss in groups.

1. In some parts of the world, children, especially girls, are unable to go to school. Why do you think this is?
2. How would your life be different if you weren't able to go to school?

2 Work in pairs. The title of this video is *Sanga's Solution*. It's about energy innovator and National Geographic Explorer Sanga Moses. What do you think it means to be an 'energy innovator'? Predict why Sanga would feel the need to become an energy innovator.

3 WHILE YOU WATCH Check your prediction from Activity 2. Watch scene 1.1.

4 AFTER YOU WATCH Read the sentences.

Tick T for *True* or F for *False*.

1. Sanga had a good job in the city. ☐ T ☐ F
2. Sanga's sister was crying because she couldn't go to school. ☐ T ☐ F
3. Sanga decided to bring his sister into the city so that she could have a better life. ☐ T ☐ F
4. Sanga couldn't quit his job, so he worked on the problem from the city. ☐ T ☐ F
5. Sanga was able to solve the problem on his own. ☐ T ☐ F
6. Sanga's new company uses waste from agricultural products to create clean fuel. ☐ T ☐ F

5 Work in pairs. Answer the questions below.

1. What does Sanga's company produce and sell?
2. Who does this product help? How?

6 Work in groups. Imagine that you have been asked to sell Sanga's product. Create an advert that advertises at least three benefits to using the product. Share your advert with the class.

7 YOU DECIDE Choose an activity. 21ST C

1. **Work independently.** Sanga's idea is an example of 'frugal innovation', or creating something new with very little money or few resources. Research other examples of people doing more with less. Share some examples with the class.
2. **Work in pairs.** Compare and contrast Sanga Moses and Sarah McNair-Landry. How are they similar? How are they different?
3. **Work in groups.** Do some students regularly miss school in your region? Why is this a problem? What might be a solution? Explain your ideas to the class.

GRAMMAR 014

Using *it* to talk about weather, time and distance, and for emphasis

It's raining again. Another bad hair day! It's strange that we've had so much rain.
It's six o'clock already. Wake up! I hate **it** when the alarm goes off.
It's a kilometre walk from here. We're late! **It** drives me crazy when I have to hurry.

1 Listen. How is *it* used? Write the number. 015

_____ to introduce weather _____ to introduce time
_____ to introduce distance _____ to introduce emphasis

2 Work in pairs. Write down three things that you don't like to happen. Use *it* in your sentences. Then share them with your partner.

1. It makes me a little angry when people interrupt me in a conversation.
2. _____
3. _____
4. _____

3 Work in pairs. Write down three things that you like to happen. Use *it* in your sentences. Then share them with your partner.

1. I like it when people give me compliments about my appearance.
2. _____
3. _____
4. _____

4 Work in groups. Make the cube. Take turns throwing the cube and completing the sentences.



Go to page 157.

WRITING

When we compare and contrast two people or things, we use phrases such as the following:

Compare:	alike	both	in the same way	too
Contrast:	although	but	on the other hand	unlike

1 Read the model. Work in pairs to identify the parts of the writing. How does the writer compare and contrast? Underline the words or phrases.

Similar But Different

I come from a large family, and I share personality traits with several family members. But it's clear to me that I'm most like my aunt, although we're different in some ways, too.

My aunt and I both like spending time outside. We both enjoy riding our bikes and going for walks. I really like going to the Farmers' Market with my aunt. We go shopping for food together, and then we stop in the park to have a drink and to talk. We both love nature. We're alike in that way. We also enjoy working in her garden growing fruit and vegetables.

It's a different story when winter comes. Unlike my aunt, I love being outside, even when it's cold. I like playing with my friends, but my aunt likes sitting by the fire and reading. Sometimes she and I play cards, although I don't really enjoy that very much. I'm too energetic to sit for so long! On the other hand, when we play one of my video games, I have fun because I'm competitive. My aunt isn't competitive at all.

But it doesn't really matter to me what we do together. I like being with my aunt and spending time with her. We're a good fit!



2 Work in pairs. How are the writer and her aunt alike? How are they different? Do you think they're more alike than different? Explain.

3 Write. Write an essay of 110–130 words to compare and contrast your personality with that of a family member or friend.

Get Outside!

‘Get outside and have fun!’

Sarah McNair-Landry

National Geographic Explorer, Adventurer and Cinematographer

21ST C

1. **Watch scene 1.2.**
2. What things can you learn about when you travel to a different place? What can you learn about yourself?
3. Think about a time that you spent outside recently. What did you do? What did you see? What did you learn? Did you have fun?

PROJECT

Make an Impact

YOU DECIDE Choose a project.

1 Plan and conduct a survey about personality traits.

- Decide which traits you want to ask about. Include positive and negative traits.
- Write the survey.
- Interview ten people. Record and report the results.

2 Plan and write a report on other factors that influence personality.

- Search the Internet for information on your topic.
- Write your report.
- Present your research to the class.

3 Write an advice column.

- Write a letter to an advice columnist about a problem that young people face.
- In groups of three, read your letters aloud. Then discuss the problem and give advice. Take notes.
- Compile your group’s questions and responses in an advice column. Make copies of your column to share with the class.



‘Endangered snakes, frogs and crocodiles are not everyone’s favourite. They have a special need for attention.’

Jenny Daltry

A Nile crocodile carrying its young

Misunderstood Animals

TO START 21ST C

- 1. How would you describe the animals in the photo?
- 2. What would you do if you saw a crocodile in the wild?
- 3. Of the three animals Jenny Daltry mentions, which do you like the least? Why?

1 Why do we care about some animals but not others? Discuss. Then listen and read.

016

Why are some animals popular while others are so unpopular? In the natural world, every animal has its place and purpose. Nature doesn't judge these animals – people do. For example, it's a common misconception that snakes are **slimy** and **disgusting** to touch. Not true! A snake's skin is smooth and dry. Another misconception is that snakes are **aggressive** and will attack humans for no reason. Also untrue! Almost all snakes, even **poisonous** ones, prefer to escape or hide unless they're surprised or attacked first. Snakes are very misunderstood animals.

Snakes aren't the only animals that are misunderstood. People think that cockroaches are dirty **pests** that like to hide in dark, **filthy** places. They hate the idea that cockroaches eat rubbish and dead animals as they **decay**. People also believe cockroaches are covered in **germs**.

In fact, cockroaches clean themselves constantly, as much as cats do. They prefer to live in clean places. It's humans who, by trying to trap or **poison** cockroaches, force them to hide wherever they can in order to survive. Luckily for them, cockroaches are very hard to **destroy**. They were here on the planet before humans appeared, and they'll probably be here after we've gone!

A Borneo keeled pit viper



A wasp

Wasps also have a bad reputation. Many people hate wasps because they believe that wasps **sting** humans at a moment's notice. Actually, most wasp species don't sting at all. Those that do sting are generally protecting their young, or responding to humans who shout or swing their hands at the wasp. Some wasp species do sting caterpillars, spiders and other insects. When stinging, the wasps inject their eggs into their living prey. The wasp larvae live inside and, when they're ready to leave, they eat their way out!

Should we care about these misunderstood species? Yes, we should! Every animal species plays a **crucial** role in the **ecosystem**. Some help **control** other pest populations. Some help pollinate flowers. Some eat mildew and mould, and others protect food crops. Some help contribute to medical research. Even misunderstood animals are necessary, and in many ways they're **beneficial** to humans.

2 LEARN NEW WORDS Listen and repeat.

017

3 Work in pairs. Did you like animals as a young child? Which animals were you afraid of? Describe them. Why were you afraid of them?



4 Read and write the words from the list.

beneficial	crucial	destroy	disgusting
ecosystem	poisonous	slimy	sting

A Siamese crocodile

At the age of eight, Jenny Daltry knew that she wanted to be a conservation biologist. She grew up collecting unusual animals, such as lizards, frogs and snakes. Some people think such animals are _____ or _____. But they play a _____ role in the _____. For example, Siamese crocodiles live in Cambodia, where they dig out the marshes to hold water during the dry season. Some people want to _____ the crocodiles, but the water would dry up and other animals would have no water to drink. So, as Jenny Daltry reminds us, even scary crocodiles are _____.

5 LEARN NEW WORDS Listen to these words and match them to the definitions. 018

Then listen and repeat. 019

misconception	misunderstood	unpopular	untrue
---------------	---------------	-----------	--------

- _____ 1. not a fact
- _____ 2. seen by others as different from how someone or something really is
- _____ 3. not liked by a large number of people
- _____ 4. a wrong idea that people believe

6 YOU DECIDE Choose an activity.

- Work independently.** Choose one of the animals in the list below. Design a new look for the animal so that it doesn't seem so disgusting or unpleasant. What can you change? Think about the animal's size, colour and other physical details.
- Work in pairs.** Together, choose one of these animals: mosquitoes, rats, spiders or worms. Separately, describe the animal in a word web. Then compare your word web with your partner's.
- Work in groups.** Rank the animals below from most misunderstood (1) to least misunderstood (5). Explain your group's ranking.

cockroaches	rats	snakes	spiders	wasps
-------------	------	--------	---------	-------

SPEAKING STRATEGY 020

Expressing surprise

Wow! Really?

That's amazing!

No way! You're joking!

Expressing disbelief

Oh, come on! You can't be serious.

That's hard to believe.

Are you sure about that?



A blue-ringed octopus

1 Listen. How do the speakers express surprise and disbelief? Write the phrases you hear. 021

2 Read and complete the dialogue.

John: This video game is full of fun facts about animals.

Mimi: Oh, really? Like what?

John: Like the fact that spiders have got six or eight eyes.

Mimi: _____

John: Yeah, I'm sure. I looked it up. Here's another one. Honeybees die after their first sting.

Mimi: _____ Well, I know a fact about bees. They communicate through different dances.

John: _____ Look at this one about bees. They've got hair on their eyes!

Mimi: _____ I know one about eyes. Did you know the colossal squid has got eyes 30 cm. (11 in.) wide?

John: _____

3 Work in groups. Cut out the cards. Take turns reading them aloud. Group members should express surprise or disbelief.

4 Work in pairs. Take turns telling a surprising story about yourself that may be true or untrue. Your partner will express surprise or disbelief and then decide if your story is true or false.



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GRAMMAR 022

Modals: Speculating about the past

could have (not sure)	They cancelled their hiking plans. They could have read about that escaped bear.
might have (not sure)	He refuses to go in the water. He might have seen a jellyfish.
may have (fairly sure)	She won't get out of the car now. She may have heard thunder from the storm.
must have (very sure)	They took her to hospital immediately. That spider must have been poisonous.

- 1 **Listen.** How sure are the speakers about their ideas? Write *not sure*, *fairly sure* or *very sure*. 023

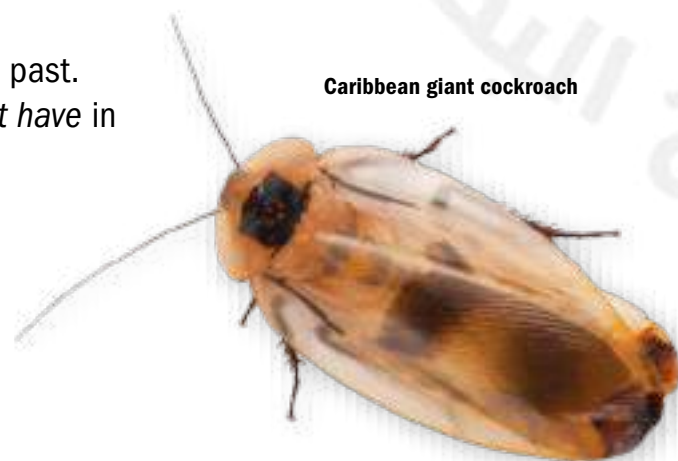
1. _____ 2. _____ 3. _____
4. _____ 5. _____ 6. _____

- 2 **Read and write.** For each item, write a sentence speculating about the past. Use *could have*, *may have*, *might have* and *must have* in your sentences.

- Alice went into the kitchen for a midnight snack. She turned on the light and screamed. _____
- Don kept scratching his arms and legs all night. _____
- Julia heard something running inside the walls. _____
- Ken found the litter bin on its side. There was rubbish all over the pavement. _____

- 3 **Work in pairs.** Take turns speculating about the past. Use *could have*, *may have*, *might have* and *must have* in your sentences.

- She cried all night.
- They ran as fast as they could.
- He got really angry.
- She screamed after biting into her sandwich.



Caribbean giant cockroach

- 4 **LEARN NEW WORDS** Listen to information about spider bites. 024 Then listen and repeat. 025

BE PREPARED.

SPIDER BITES

Are you **scared of** spider bites? Learn what to do.

- Do you have a spider **bite**?
- Spider bites can **hurt** a lot.
- Stay **calm**. Try not to get **upset**.
- If you think the bite is from a poisonous spider, don't move. Moving makes the **venom** go through your body faster.
- Wash the bite with soap and water. Then apply a cloth with cold water or ice to the bite.
- If the bite is on a hand, arm or leg, keep the bite area above the level of your heart.

CALL FOR HELP IMMEDIATELY.



- 5 **Work in pairs.** Look at the poster again. The same advice is good for some scorpions, too. Take turns describing what to do if you're stung by a scorpion.



Emperor scorpion

- 6 **Work in groups.** Imagine that your friend showed you a bite on his arm. Speculate about what happened. Use *could have*, *may have*, *might have* and *must have* in your sentences.

1 BEFORE YOU READ Discuss in pairs. What do you know about bats? Make a two-column table. Write five things you think are true in the left-hand column. **21ST C**

2 LEARN NEW WORDS Find these words in the reading. What do you think they mean? Use a thesaurus to check. Then listen and repeat. **026**

fangs	lethal	lick	suck
-------	--------	------	------

3 WHILE YOU READ Listen and read. Notice details that support the beliefs you listed in Activity 1. **027**

4 AFTER YOU READ Work in pairs to answer the questions.

1. What is the main idea of the article?
2. How many species of bats are there?
3. What are some false stories about bats?
4. Where do vampire bats get the blood they need?
5. How are vampire bats beneficial?

5 Find details to support your beliefs. Look at your table from Activity 1. Next to each of your beliefs about bats, write any details from the reading that support those beliefs.



There are around 1,200 species of bats on the planet. Most of them eat insects or fruit. Some bats eat scorpions, frogs or other small animals. But there are some bats that aren't interested in any of those foods. These are the often-feared vampire bats. And yes, it's true! Vampire bats do need to drink blood to survive!

Why are so many people scared of bats? They're scared in part because there are so many false stories about bats. One story is that bats are flying mice. Another is that bats are blind, and so they can get caught in your hair. Many people think that bats are not very important animals, but this is also wrong. Like bees, bats are pollinators, and are very important for spreading seeds of many plants.

A lot of people are scared of vampire bats because they have fangs. The bats use their fangs to make small cuts in an animal's skin, but they don't suck blood through their fangs. Instead, they wait until blood starts flowing from the cut. Then they lick the blood with their tongues, just as a kitten drinks milk from a bowl.

Vampire bats get blood from birds, cows, horses and other farm animals. They can drink gently from a sleeping animal for half an hour without waking it. Their bite isn't lethal, and the blood loss doesn't hurt the animals.

Vampire bats can live for about two days without drinking blood. This is usually plenty of time to look for food. And, unless there's no other food source available, a vampire bat won't bite a human. In general, vampire bats are comfortable, and sometimes even friendly, around humans.

In addition, vampire bats are a valuable source of information for medical research. While they're drinking blood, these bats release substances that help blood keep flowing as they drink. Scientists are studying vampire bats to see if they can develop medication that works in the same way. Their research could one day help people with circulation problems or medical conditions such as heart attacks and strokes.

6 Discuss in groups.

1. Even after they've learnt that bats are beneficial, some people still don't like them. Why do you think that is?
2. What insects and animals are pollinators? Why is this important for the planet?

Vampire Bats

THE TRUTH EXPOSED!



A leopard seal

- 1

BEFORE YOU WATCH Discuss in pairs. Look at this photo. How would you feel if you were near this animal? What would you do?
- 2

Write. The video you're going to watch is called *Face-to-Face with a Leopard Seal*. From the title, predict what will happen when the photographer comes face-to-face with the animal in the photo.
-
- 3

WHILE YOU WATCH Circle three words that relate to the way the leopard seal is described in the video. Watch scene 2.1.
- | | | | |
|------------|-----------|-----------|------------|
| aggressive | big | caring | disgusting |
| nervous | predatory | terrified | useless |
- 4

AFTER YOU WATCH Work in pairs to answer the questions.

1. Where does the leopard seal live?

2. How does Paul Nicklen feel when he first gets into the water?

3. What does the leopard seal do to Paul to show a threat?

4. What does the leopard seal first bring to Paul?

5. Why does the leopard seal seem disgusted?

6. Why does Paul say that the leopard seal is panicked? What does she start doing at this point?

7. What are the misconceptions that Paul had about the animal? How does she change his ideas?

- 5

Work in pairs. Look at your answers from Activity 2. Did you correctly predict the outcome of the video? Explain how the leopard seal's actions help classify it as a misunderstood animal.
- 6

Discuss in groups. Why do you think Paul wanted to photograph the leopard seal? What can he teach others about this animal with his photos and his story? Explain, using examples from the video.
- 7

YOU DECIDE Choose an activity. 21ST C

1. **Work independently.** Research leopard seals. Learn about their role in the Antarctic ecosystem. What animals do they prey on? Who are their predators? Prepare a short presentation to share with the class.

2. **Work in pairs.** Compare and contrast the leopard seal with another misunderstood animal from this unit. Use a Venn diagram to show the two animals' similarities and differences.

3. **Work in groups.** Many people consider the leopard seal a dangerous, deadly predator. Create an advertisement to educate people about the leopard seal and persuade them to change their opinions.

GRAMMAR 028

Infinitives with and without to

- To **hold** a lizard is scary!

He doesn't want **to hold** lizards.

She's excited **to hold** one.

That's the lizard **to get**!

She's going to the pet shop **to buy** it.
- I can't **hold** one!

Make him **try** it.

We'll watch her **do** it.

OK. I'll let her **buy** it.

I'll even help her **pay** for it.

1 Read. Circle the correct letter.

1. My brother really wants _____ get a pet bearded dragon.

a. Ø b. to
2. My mother will absolutely not let him _____ buy one.

a. Ø b. to
3. He's planning _____ save money for one anyway.

a. Ø b. to
4. I can't wait _____ see what happens when Mum finds out.

a. Ø b. to
5. She'll make him _____ take it back to the shop.

a. Ø b. to
6. I really want _____ see him get in trouble instead of me!

a. Ø b. to

2 Work in pairs. Play Noughts and Crosses.

Use infinitives with or without to in your sentences. One of you is X; the other is O.

I might touch a hairy spider!

Not me! I can't do it!

might	can't	have
make	want	help
watch	feel	ask

Ants



A bearded dragon

WRITING

A process description essay explains how something is done or how something happens. The purpose of the steps and the order in which they happen are described.

Purpose:	in order to	so that		
Sequence:	before	during	after	finally
	first	then	next	while
	little by little	meanwhile	over time	

1 Read the model. Work in pairs to identify the process being described. What words and phrases does the writer use to show purpose and sequence? Underline them.

Managing My Fear

When you're very, very afraid of something, fear can affect you. When I was younger, I saw my cousin fall onto an ants' nest. The ants attacked him, and he was covered in horrible bites. After that, I became very scared of ants. But when I turned 13, I decided I couldn't let my fear get to me. It only took me a few steps.

First, I read a lot about different ants. I didn't focus on bites, but instead I read about how beneficial ants are to the planet. Ants are really cool! They're hard-working, social and organised. They help bring air and nutrients to the soil. They pollinate plants, clean up decaying matter and help control other insects.

Next, I began to watch ants from a safe distance. I started to look at a colony of ants in real time on the Internet in order to learn how they live. Little by little, I felt more comfortable about ants.

Finally, the most important step was to face my fear on my own. One day, I went outside and let an ant crawl onto my hand. It was a bit weird at the beginning, but I really felt no fear at all.

As you can see, it's easy to manage your fears. Just remember to read and learn as much as you can. When you are ready, it's important to take the time to feel comfortable at every step, but the end result is worth it!

2 Work in pairs. Imagine you're scared of an insect or animal. What steps would you take if you wanted to control your fear? Why?

3 Write. Many people are scared of grey parrots. Imagine you have a new grey parrot. You don't want it to be misunderstood. How could you help people to understand your pet better? How will you train it to be a good pet? Write an essay of 110-130 words to your English friend to describe the process.

Keep an Open Mind

'To me, it's symbolic. If you don't care about this particular snake, why should you care about anything else? Each one is part of a great web.'

Jenny Daltry

National Geographic Explorer, Herpetologist and Conservationist

21ST C

1. **Watch scene 2.2.**
2. What can you do to learn more about misunderstood animals?
3. How can you help other people understand misunderstood animals?

PROJECT

Make an Impact

YOU DECIDE Choose a project.

1 Make a set of misunderstood-animal cards.

- Choose at least five misunderstood animals to research. Find two or three facts that might help clear up misunderstandings about the animals.
- Write information about the animal on one side of the card. Include a photo or drawing and caption on the other side.
- Present your cards to the class.

2 Plan and produce an animal quiz show for TV.

- Decide on the format of your quiz show.
- Research and prepare questions about animals for competing teams.
- Act out and film the show.

3 Educate others about misunderstood animals.

- Collect information about a group of misunderstood animals.
- Make informational posters or fact sheets.
- Display the posters in your school or hand out the fact sheets to students and teachers.

A jumping spider



Express Yourself

1 Read and listen to the story. 029

A Day in the Life

Well, finally something is happening, Kim thought. So far, it had been the most boring summer ever. School was starting in less than a week, and she had nothing interesting to report to her classmates. Suddenly, loud beeps, warning that a lorry was backing up, broke the afternoon silence. Kim held her bottle of cold water against her forehead as she walked over to the bushes that separated her house from the one next door.

I hope the new neighbours are cool, she thought as she looked at the stacks of boxes outside the lorry. Let's see. Lots of boxes! That one says, 'kitchen stuff' and that one says, 'Jane's stuff'. Wow, what a huge TV! Oh, a keyboard. I wonder who plays that. That box says, 'Jane's trophies'. Hmm. I wonder who Jane is. And look at that, a water bowl with the name Cupcake on it.

Maybe they have a cat, thought Kim. And then she saw a long pink lead tied to one of the handles on the back door of the lorry. Whatever was on the other end of the lead was under the lorry, staying out of the hot sun. And it probably wasn't a cat!

Kim stepped around the bushes to get a better look. 'Here, Cupcake. Come here, girl!' she called. She poured some of her water into the bowl and called again. 'Here, Cupcake. Come on out, little girl.'

Kim heard something move. A large dog crawled out from under the lorry and then stood up and shook itself. 'Well, look at you,' Kim said. 'You're not a little girl, are you? But you look so sweet! Are you thirsty? Here, have some water.'

It was after the dog had finished the water that Kim looked up.

'I see you've met Cupcake,' said a girl Kim had never met before. 'I'm Jane.'

'I'm Kim. Nice to meet you. Welcome to the neighbourhood. I'll help you move some of your stuff.'

They'd barely started talking and carrying some boxes when Kim heard someone shouting. From the other side of the bushes, her mum shouted, 'That dog's a *pit bull*, Kim. Get over here right now before that dog *bites* you! Those dogs are so aggressive. Come *here!*'

'Mum,' Kim said calmly. 'Relax. She's so friendly and sweet. Her name's Cupcake!'

'I don't *care* what its name is. Come home *now!*'

Kim looked at Jane, and then looked down at her feet, not sure of what to say next.

'Go ahead,' Jane said. 'We can talk later. And maybe you can show me how to get to school.'

'Sure, Jane. I'd like that. And maybe we can take Cupcake for a walk.'

Great, Kim thought as she returned home.

Maybe the rest of the summer won't be so boring after all.

2 Work in groups. Discuss the questions.

1. What happens in the story?
2. What are some of the misconceptions in the story?
3. Why was Kim's mum anxious?

3 Connect ideas. In Unit 1, you learnt how people can misunderstand others and be misunderstood. In Unit 2, you learnt about misunderstood animals. In both situations, people are involved. What does this tell you about the way we think? About our misconceptions?

4 YOU DECIDE Choose an activity. 21ST C

1. Choose a topic:
 - no one understands me
 - no one understands (animal)
2. Choose a way to express yourself:
 - a short story
 - a song or a poem
 - a video
3. Present your work.

Everybody's Doing It!

‘There is socially contagious behaviour
when you’re in a crowd.’

Iain Couzin

A group of nearly 2,000 kayaks and canoes

TO START 21ST C

1. Look at the photo. What are the people doing? Do you think they meant to do this? Explain.
2. Think about a time when you were in a large group like the one in the photo. What was going on? Why were you and all the other people there?
3. According to Iain Couzin, when we’re in a group, we tend to act like the others in the group. Do you agree with him? Why or why not? Give examples.

1 Humans usually make their own choices about joining groups. Do you think animals can make these same choices? Discuss. Then listen and read. 🔊 030

We've all looked up at the sky to see a group of birds flying together. We might see noisy geese flying in a V-shaped **formation** as they **migrate** to a warmer climate, or a spiral of starlings at sunset. Or, unfortunately, we
5 may have seen a group of mosquitoes or wasps coming at us! On land, we might see a group of wild horses running free, or a group of dogs in a field, or a group of monkeys in trees. Underwater, we might see a group of fish swimming together in sudden but perfectly **co-ordinated** movement.

A group of fish swimming away from a sailfish

10 Most groups that humans **belong to** have **leaders**. Sometimes, though, we may be in crowds with no leaders, as in a stadium full of sports fans. Can we **assume** that animal groups act in the same way? In the case of elephants, the oldest female is the leader. All her
15 offspring, or young, and their offspring remain with her for many years. But in the case of fish that assemble in groups, there is no one leader. The fish come to an agreement together through **consensus**. They see what their neighbours are doing and mimic their behaviour.
20 If they see a **potential** predator, they will all quickly swim away together to avoid it. Any fish that **prefer** to go off alone are probably going to be lunch!

Scientists now **realise** that **collective** behaviour in animals is a highly **efficient system** that is beneficial
25 in many ways. These group behaviours allow animals to complete their **migrations** in relative safety, find food and protect group members from predators.

2 LEARN NEW WORDS Listen and repeat. 🔊 031

3 Work in pairs. Can you think of other animals that belong to groups with leaders? Other animals that belong to groups without leaders? Make a list for each type of animal. Share your lists with the class.

4 Read and circle the correct word.

Iain Couzin liked animals as a child, but it was as an adult that he decided to focus on *efficient* / *collective* behaviours in animals. He came to *realise* / *assume* that, unlike the rhino or leopard, not all animals *prefer* / *migrate* to live or hunt alone. He discovered that many animals have highly *potential* / *co-ordinated*, complex social *systems* / *consensus* that permit them to do things as a group that they could never do alone. His studies on birds, fish and insects allow scientists to find *potential* / *assumed* solutions to problems such as how humans affect animal habitats, oil spills and even world hunger.

5 LEARN NEW WORDS Listen to these words and match them to their synonyms. 032 Then listen and repeat. 033

assemble	crowd	mimic	remain
_____		1. group	
_____		2. stay	
_____		3. imitate	
_____		4. come together	

6 YOU DECIDE Choose an activity. Work in pairs. 21ST C

- Why do animals remain in groups? What are the advantages? Are there any disadvantages? Make two lists.
- Some animal behaviours seem unselfish. Individual members will put the good of the group above their own. Describe an example.
- You want to form a group at school. What are three rules that group members would have to follow? Why are those rules important?

SPEAKING STRATEGY 034

Expressing cause

Since she's scared of wasps, we stayed inside.
Because of the lack of food, the animals had to travel further and further away.
The experiment was called off due to the poor weather conditions.

Expressing effect

She's scared of wasps, so we stayed inside.
There was a lack of food. As a result, the animals had to travel further and further away.
The weather conditions were poor. Consequently, the experiment was called off.

1 Listen. How do the speakers express cause and effect? Write the words and phrases you hear. 035

2 Read and complete the dialogue.

Alex: Iain and his team worked with army ants, too.
Billy: What did they want to find out?
Alex: _____ ants are so social, the team wanted to see how they organise their collective behaviours.
Billy: Don't they live together in huge groups?
Alex: Yeah, and _____, they have to be really organised.
Billy: It makes sense, I guess, _____ their numbers.
Alex: Yes, there are usually tens of thousands of ants moving at one time. _____ potential traffic jams, they organise a kind of super-motorway.
Billy: And, _____, everyone keeps moving?
Alex: Yes! The ants with food use a wide middle lane, and the ants that aren't carrying anything form lanes on the side.

3 Work in groups. Take turns. Use a coin to move (heads = 1 space; tails = 2 spaces). Express cause or effect.

4 Work in pairs. Humans are harming many habitats. What are some reasons for this?



Go to page 161.

Phrasal verbs

The scientists **talked over** the problem.
The scientists **talked** the problem **over**.
The scientists **talked** it **over**.

They **worked out** a solution.
They **worked** a solution **out**.
They **worked** it **out**.

The scientists **talked about** the problem.
The scientists **talked about** it.

The scientists **looked into** the evidence.
The scientists **looked into** it.

- 1 Read and complete the sentences.** Make any necessary changes.

apply to	calm down	cheer up	count on
hold back	look at	turn out	work out

Humans love to laugh. In fact, even hearing other people laugh can _____ *cheer* _____ us _____ *up* _____ or make us smile. But sometimes, even when it isn't appropriate, we just can't help ourselves and we start laughing, too! Who hasn't seen people trying hard to stop giggling and to _____ themselves _____ in a place where they should be quiet?

Yawning is another common contagious behaviour. When you _____ someone who's yawning, you usually want to yawn, too. Can you _____ that yawn _____? Probably not. It's very hard to resist the urge!

Did you know that even animals yawn? It _____ that chimpanzees, dogs, lions and other animals yawn when an animal in their group yawns.

Why are these behaviours so contagious? Scientists think they have _____ the answer _____. They believe the same reason _____ both behaviours. They are old, basic ways to show a social connection with others in your group.

- 2 Read the text in Activity 1 again.** Circle four sentences with separable phrasal verbs. Two can be rewritten without separating the verb. Write them below.

- 3 LEARN NEW WORDS** Do you think gorillas and wolves can yawn contagiously?

Listen. 🎧 037 Then listen and repeat. 🎧 038



a **troop** of gorillas



a **flock** of birds



a **herd** of elephants



a **swarm** of ants



a **pack** of wolves



a **school** of fish

- 4 Work in pairs.** Go back to page 46. Take turns reading sentences in the first paragraph aloud. Each time you see the word *group*, say one of the words in Activity 3 instead.

- 5 Work in groups.** Listen again. Then take turns using phrasal verbs from the list to summarise the information.  **039**

build up carry out clean up rely on respond to

- 6 Work in pairs.** Talk about three surprising things you have learnt about contagious behaviour. Use some phrasal verbs from the list.

calm down cheer up respond to think about turn out work out

1 **BEFORE YOU READ** Discuss in pairs. The title of the reading is *Humans in Groups*. What groups do you belong to? Make a list. **21ST C**

1	left-handed people
---	--------------------

2 **LEARN NEW WORDS** Find these words in the reading. What do you think they mean? Use the context to help you. Then listen and repeat. **040**

influence	intention
join	stand out

3 **WHILE YOU READ** Listen and read. Notice definitions and examples in the text. **041**

4 **AFTER YOU READ** Work in small groups to answer the questions.

1. What is the main idea of the reading?
2. What are some kinds of groups mentioned in the reading?
3. Why do people want to join groups?
4. How are in-groups and out-groups different?
5. What are emergent groups? Have you ever belonged to an emergent group? Explain what happened.

5 **Define words.** Choose five words or phrases from the reading. Make a two-column table. Write the word or phrase on the left and its definition on the right.



A team of young volunteers picking up litter in the park

Humans in Groups

You and all humans belong to many kinds of groups. In some, membership is involuntary – that is, you were not part of the decision to belong. For example, if you were born in Peru, you are a member of the group Peruvians. Other examples of involuntary group membership include left-handed people or brown-eyed people.

Most of the time, though, you and the rest of us want to join, or become members of, certain groups. Why? Joining the technology club, the school choir, or a volunteer group that visits people in hospital reflects your interests and becomes part of your social identity. You become an accepted member of the chosen in-group. At the same time, you remain different from the out-group, those people who are not in the group. This reflects the human desire to belong, but also the desire to stand out, or be seen as different.

Sometimes, people volunteer to perform an activity for the benefit of their community, such as cleaning up the local area and picking up all the litter. There are many benefits to coming together in groups like this. People report increased confidence by doing something new, as well as increased happiness at meeting new people and a sense of being part of a wider community.

Most groups we join have the intention of lasting over time. They work to influence others in some way. But sometimes, emergent groups form without goals or structure. The members of emergent groups don't know each other, but come together suddenly to respond to an event. For instance, a group of people might see a car accident and immediately come together to help the victims.

Whether we have the same colour eyes as someone else or we're helping to clean up our neighbourhood, humans are social beings who come together in groups.

6 Discuss in groups.

1. Go back to your own list of the groups you named in Activity 1. What kinds of groups were named? Compare and contrast the groups.
2. In Unit 1, you learnt about your personal identity. In this unit, you learnt about your social identity as a member of groups. How do these two identities influence one another? Give an example.
3. Would you like to volunteer for a group in your community? What would you like to do?

1 BEFORE YOU WATCH Discuss in pairs. Compare your own abilities with those of an ant. Name something an ant can do that you cannot.

2 Read and circle. The video you're going to watch is called *Smarter by the Swarm*. The video is about swarm intelligence. Can you guess what that means? Circle the letter.

- a. the ability of people to pressure each other into doing something
- b. improved knowledge and ability that comes when organisms work together
- c. ants living in a colony

3 WHILE YOU WATCH Note two benefits of ants working together. Watch scene 3.1.

4 AFTER YOU WATCH Work in pairs. Tick T for *True* or F for *False*.

- | | | |
|---|-------------------------|-------------------------|
| 1. Your brain is about 4,000 times larger than an ant's brain. | ☐ T | ☐ F |
| 2. Ants often look lost when they're in large groups. | ☐ T | ☐ F |
| 3. Ants leave a scent that sends a message to other ants in the colony. | ☐ T | ☐ F |
| 4. Ants can communicate the fastest route to get to a place. | ☐ T | ☐ F |
| 5. Companies are mimicking ant behaviour to be more efficient. | ☐ T | ☐ F |
| 6. These companies learnt that ant behaviour isn't effective in humans. | ☐ T | ☐ F |

5 Work in pairs. What is *swarm intelligence*? Describe the meaning of this term. Use examples from ants and people in your answer. Then go back to Activity 2. Did you have the correct answer?

6 Discuss in groups. Think about shipping, transport and airlines. Why is it important for vehicles to work together? What do you think happens if a lorry, boat or plane doesn't communicate with others in its group? Compare this with what happens if an ant doesn't communicate with the rest of its colony.

A group of weaver ants work together to carry a drop of water back to their nest.

7 YOU DECIDE Choose an activity. 21ST C

1. **Work independently.** Create a comic strip with ants as the main characters. Your comic strip should show both individual and group behaviour with ants.
2. **Work in pairs.** Find out about a team of people who work together to solve problems. Explain who's on the team and what each person's role is. Share your answers with the class.
3. **Work in groups.** Imagine that you're a team of researchers and you have a group of microbots. Develop a project idea for how they can work together to get something done. Explain the goal of the project and how the microbots would make it happen.

GRAMMAR 042

Enough, too many, too much: Talking about amounts

I've got **enough** bags, but there are **not enough** volunteers. We need more.
You've put **too many** things in this bag. I can't close it.
Do you want to join the community litter pick?
Yes, I'd love to. There's **too much** litter in this area.

1 Listen. For each sentence you hear, tick the correct amount. 043

	less than needed	the right amount	more than needed
1.	☐	☐	☐
2.	☐	☐	☐
3.	☐	☐	☐
4.	☐	☐	☐

2 Read and complete the dialogue.

Carlos: Do you want to join our community litter pick later? Right now, we haven't got _____ people participating.

Juan: No, thanks. I've got _____ things to do this afternoon.

Carlos: You haven't got _____ time to see Marco? He'll be there.

Juan: Really? OK then, I'll do my errands afterward. They shouldn't take _____ time.

3 Work in groups of three. Take turns playing *Rock, Paper, Scissors*. The winner chooses one item from list A and one from list B. Then the winner chooses another player to make a sentence with the chosen items. Each correct sentence is worth 1 point. The player with the most points at the end wins.

LIST A:	LIST B:
enough	dancers
not enough	money
too many	people
too much	time
	volunteers

rock

paper

scissors

WRITING

An email includes a subject line, a greeting and a sign-off.

Using good examples in the main body of your email is one way to explain and support the main idea. We can introduce examples with phrases such as:

for example for instance in other words such as

1 Read the model. Work in pairs to identify the parts of the email. How does the writer introduce examples? Underline the phrases.

To: Sam From: Malik Subject: Group Behaviour

Hi Sam,

Thanks for your email. It's been a while since we last met. Your project about group behaviour sounds interesting! I think my behaviour changes when I'm with my friends too.

5 Sometimes I like being alone, but I usually prefer being with my friends. My friends and I enjoy being together because we're interested in a lot of the same things. For instance, we all like sports, and most of us play on the school football team. We also ride our bikes to places we like, such as the park.

At other times, we love looking round the shops. We don't usually buy very
10 much, but we enjoy seeing all the latest fashions and spending time together, talking and laughing. We all share the same sense of humour. In other words, we find the same things funny, but sometimes we don't even know why we're laughing. For example, if one of us starts laughing about something, the rest of us will join in, even if we don't know what we're laughing about. We can't help it!

15 What about you? What do you enjoy doing with your friends? I'd love to know if your behaviour changes when you're with them.

Write soon!

Malik

2 Work in pairs. What examples of group behaviour does the writer describe? Are any of them contagious group behaviour? If so, which ones?

3 Write. Every winter, tens of thousands of Bahrainis go camping in Sakhair. Write an email to your friend of 100–120 words describing this group behaviour in Bahrain. Make sure you include several examples.

Collaborate

‘From invasive cells to schooling fish to human cultures, groups can accomplish what solitary individuals cannot.’

Iain Couzin

National Geographic Explorer, Behavioural Ecologist



21ST C

1. Watch scene 3.2.
2. Iain studies group behaviour of birds, insects, fish and other animals. What other group behaviours could we learn from?
3. When is it better to work alone? To work in a group? Name something that you accomplished as a group member that you couldn't have done alone.

PROJECT

Make an Impact

YOU DECIDE Choose a project.

- 1 **Plan and carry out a community activity.**
 - Choose an activity to carry out that will benefit your community.
 - Notify people about the time and place of your community activity.
 - Film your activity and present it to the class.
- 2 **Plan and carry out an experiment on human group behaviour.**
 - With a group, discuss behaviours that you find contagious, such as yawning, laughing and different facial expressions.
 - Take turns to see if you can make other people in your group mimic your behaviour.
 - Write the results of your experiment, and present them to the class.
- 3 **Plan and carry out a photo shoot in nature.**
 - Choose a local insect or bird to observe.
 - Research its group behaviours and take photos.
 - Write and present a report to the class.



Fashion Footprints

‘When you buy a piece of clothing, there should be a personal connection.’
Asher Jay

Boys in São Paulo, Brazil

TO START 21ST C

1. Are these boys dressed the same? Discuss the similarities and differences.
2. Do you choose the clothes you wear?
3. Do you have a personal connection with all of the clothes you wear? Why or why not?

1 Why do people wear the clothes they wear?

Discuss. Then listen and read. 044

There are many different reasons we buy and wear the clothes we do. We choose clothes for practical reasons, such as weather and **comfort**. We also wear the clothes we do for psychological reasons. These include wanting to feel powerful, to feel attractive, and to show our **creativity** and personality. Wearing certain **styles** affects how we feel about ourselves and how other people see us. We may care about the latest **trendy** fashion by popular **designers**, or we may prefer practical clothes. We also make our clothing choices for

other reasons, such as showing we **fit in** with a social group, for example, a volunteer group or a sports team.

The environment is another reason that clothing choice is important. The clothes we buy and wear **have an impact** on the planet. This is known as our fashion **footprint**. Each one of us has our own individual footprint. We need to **take responsibility for** our clothing decisions and **do our part** to reduce our fashion footprints.

Shop owner in vintage clothes shop



A lot of our clothing is made from natural **materials** such as **cotton**, wool, leather and silk. **Synthetic** materials, such as nylon and polyester, are also very popular. But all of these materials, whether natural or synthetic, affect the environment. For example, many **toxic**

chemicals are used to make leather shoes. The **manufacture** of cotton jeans requires enormous amounts of water and energy. And if dyes are used to colour any of these materials, then even more water, energy and toxic chemicals are required.

2 LEARN NEW WORDS Listen and repeat. 045

3 **Work in pairs.** Talk about what's in your wardrobe. Describe the materials your clothes are made of. What is your favourite outfit? How often do you wear it?

4 Read and write the words from the list. Make any necessary changes.

cotton	creativity	designer	fit in
manufacture	style	take responsibility for	trendy

Asher Jay has a great sense of _____, but she also cares about our planet. She’s a fashion _____, or a person who designs clothes. She’s also an artist, writer and environmental activist. Asher wants us all to _____ protecting the environment and animals. In one fashion line, she created _____ shirts, dresses and skirts influenced by the bright oranges and greens of endangered coral reefs. For Asher, fashion is more than an effort to _____ with a crowd. She believes the clothes you wear can communicate both a message you care about and your own _____.

5 LEARN NEW WORDS Listen to these words and match them to the definitions. 046 Then listen and repeat. 047

attractive	popular	psychological	social
------------	---------	---------------	--------

- _____ 1. mental
- _____ 2. having a quality that people like
- _____ 3. related to people being with one another
- _____ 4. liked by many people

6 YOU DECIDE Choose an activity. Work in pairs.

1. Some schools require students to wear uniforms. What social or psychological reasons might they have for doing this?
2. Discuss. Do you dress more for yourself or for the impression you might make on others? Do you and your friends dress in a similar way? Do you prefer to fit in and not feel comfortable or just be yourself and feel comfortable?
3. Do a video interview. Ask your classmates about their favourite outfits and why they like them.

Asher Jay



SPEAKING STRATEGY 048

Asking for clarification

- When you say _____, what do you mean?
- Are you saying that _____?
- Could you explain that a little more?

Clarifying

- What I meant was _____.
- That’s right./No, that’s not it. I meant _____.
- Of course. I was referring to _____.

1 Listen. How do the speakers make sure they’re communicating clearly? Write the phrases you hear. 049

2 Read and complete the dialogue.

- Pat: I like to choose my clothes depending on my mood.
- Ken: When you say ‘mood’, _____?
- Pat: I _____ whether I feel happy, nervous, sad ... whatever.
- Ken: Oh. _____?
- Pat: _____ my feelings. When I feel really happy, I like to wear bright colours like yellow, red and orange. When I’m sad, I wear black or grey. And when I’m nervous, I wear my favourite old blue jumper, especially on exam days.
- Ken: _____ it’s your lucky jumper?
- Pat: Yes, I guess so. It makes me feel calmer.



3 Work in groups. Spin the wheel and discuss, using the words for each topic as instructed. Ask for clarification and clarify as needed.



Go to page 157.

4 Work in pairs. How does asking for clarification and clarifying help you communicate? How can it help other people, such as doctors or teachers, communicate?



GRAMMAR 050

Present passive: Describing actions and processes

They use a lot of pesticides to grow cotton.

A lot of pesticides **are used** to grow cotton.

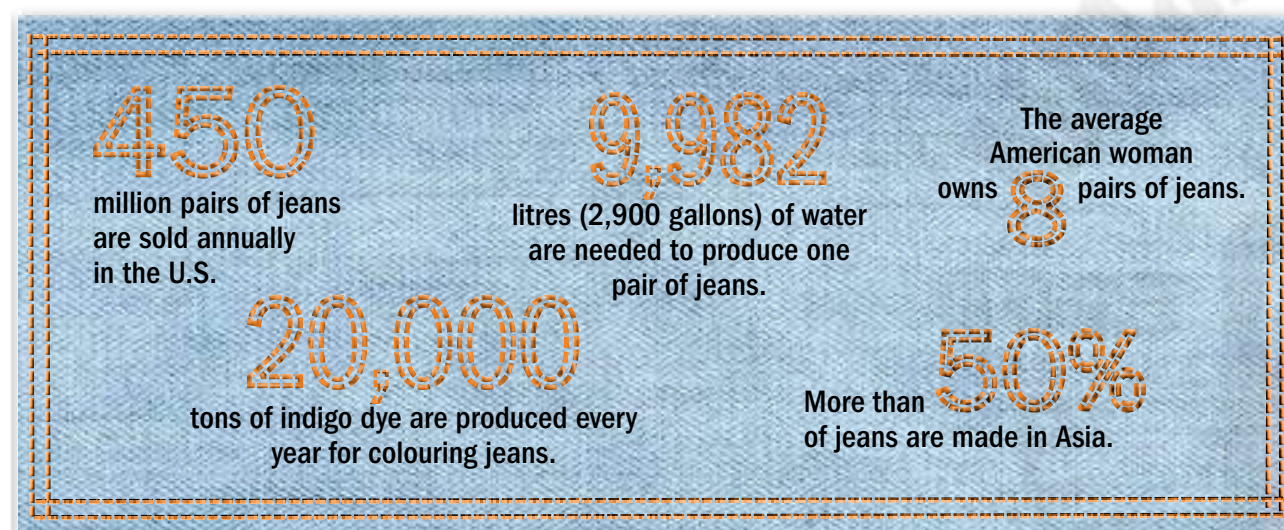
They make a lot of clothing from synthetic materials.

A lot of clothing **is made** from synthetic materials.

- 1 **Listen.** Circle all the passive forms you hear. 051

are bought are made are required are used is made is used

- 2 **Read.** Underline all examples of the present passive.



- 3 **Work in pairs.** Talk about how jeans are made. Change the verbs to the present passive.

1. People make jeans with a material called denim.
2. They make denim out of cotton.
3. They sometimes mix polyester or other synthetic materials into the denim.
4. They dye the denim yarn before they make the denim fabric.
5. After they cut the fabric and make the jeans, they pre-wash them.
6. They sometimes add stones when they pre-wash jeans to make them look older.

Jeans are made with a material called denim.

- 4 **LEARN NEW WORDS Listen.** Learn about the journey of jeans. 052 Then listen and repeat. 053



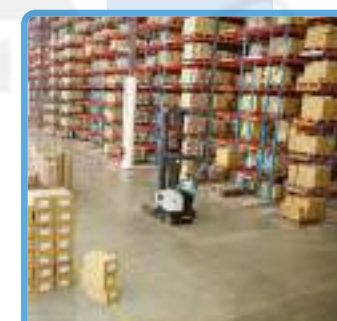
ship



assemble



factory



warehouse



retailer



purchase

- 5 **Work in pairs.** Look at the infographic above. Use the present passive to describe the journey of jeans. Use the words in the box to describe the process.

after that finally first then

- 6 **Work in groups.** Use the present passive to describe how something else is done or made.



1 **BEFORE YOU READ** Discuss in pairs. Based on the title and the photos, what do you think the reading is about? 21ST C

2 **LEARN NEW WORDS** Find these words in the reading. What do you think they mean? Use a dictionary to check. Pay attention to the pronunciation of each word. Then listen and repeat. 054

donate	eco-friendly	entrepreneur
give back	profit	

3 **WHILE YOU READ** Listen and read. Look for similarities and differences. 055

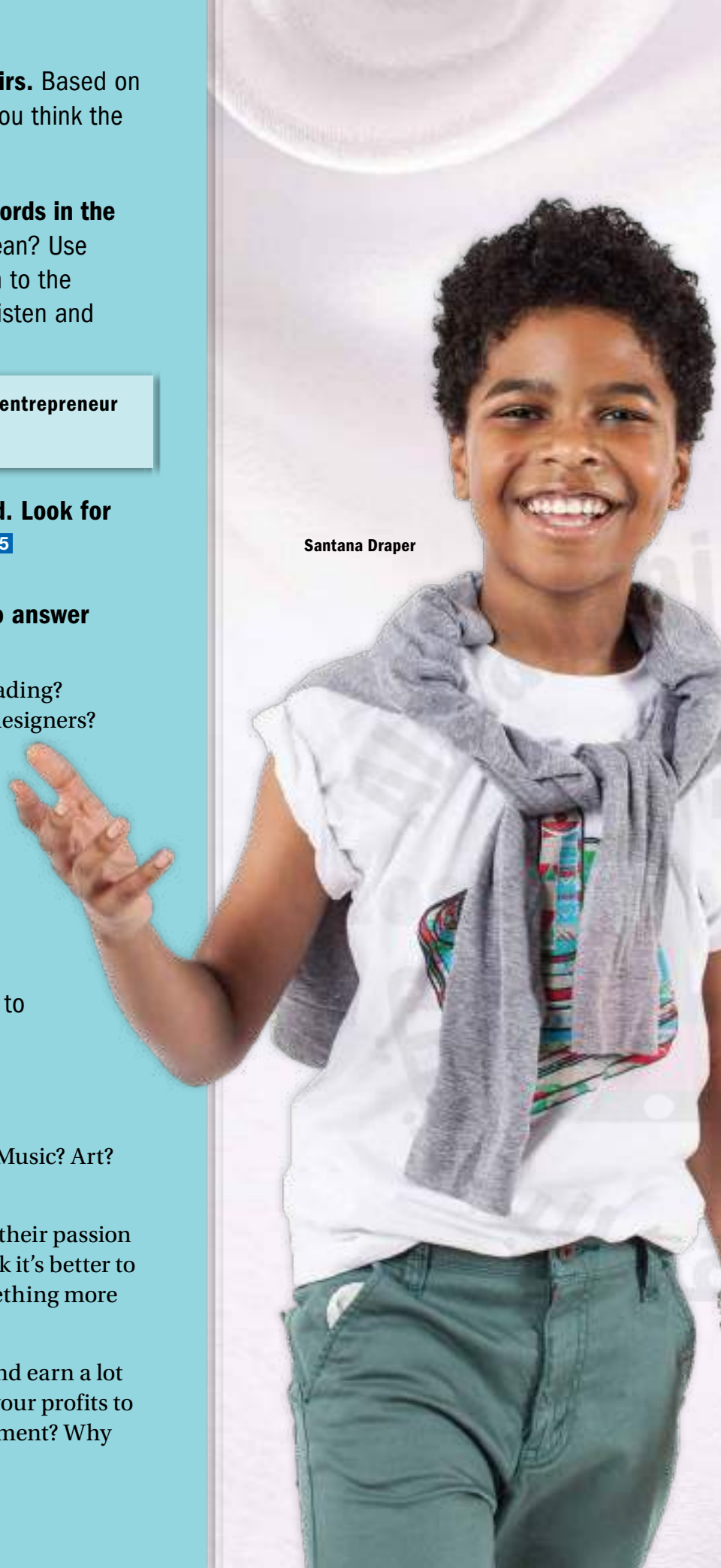
4 **AFTER YOU READ** Work in pairs to answer the questions.

1. What's the main point of the reading?
2. What's unusual about the two designers?
3. How did Santana Draper and Maya Penn get their start?
4. What's one important reason they were successful?
5. How do the two designers use part of their profits?

5 **Compare and contrast Maya and Santana.** Use a Venn diagram to organise information.

6 **Discuss in pairs.**

1. What do you have a passion for? Music? Art? Sports? Animals? Why?
2. Santana and Maya are following their passion and finding success. Do you think it's better to follow your passion or to do something more practical?
3. Imagine you create a company and earn a lot of money. Would you use any of your profits to help people? To help the environment? Why or why not?



Santana Draper

A Passion for FASHION

Pursuing a dream isn't just for grown-ups. These young designers grew up with a passion for fashion – and for helping others.

Santana Draper is a young entrepreneur with a giving spirit. When he was very young, he overheard adults discussing a terrible storm. The storm affected families and left their children without holiday presents. Santana offered to give his toys away as gifts for the children. He said that he could make more toys for himself out of paper. The name of his company today? PaperToy Clothing!

Santana's parents supported his creativity and decided to have some of his sketches printed on T-shirts. People who saw Santana's work wanted to know where they could purchase the T-shirts, and an online fashion business was born. He designs T-shirts for males from 10 to 25 years old, and he has created a 'wear and give' programme to give back to his community. For each T-shirt a customer buys, part of the sale price goes towards a programme to feed hungry children. 'I want to inspire boys and young men to action by producing wearable art that lives with you,' Santana says.

Teenage entrepreneur Maya Penn was only eight years old when she started her first business, Maya's Ideas. She makes eco-friendly clothing and accessories that are sold in many countries, including Australia, Canada,

Denmark and Italy. When Maya was very young, her mother taught her to sew. Maya would find pieces of fabric around the house to turn into a scarf or hat. When she wore her creations in public, people would stop her and ask where they could buy them!

Even before she opened her business, Maya knew she wanted her clothes to reflect her beliefs. She decided that her items had to be eco-friendly, and that she would donate 10 to 20 per cent of her profits to charities and environmental organisations. 'I've had a passion for protecting the environment and its creatures since I was little,' Maya says.

In Bahrain, there's a growing trend to raise public awareness about where clothing comes from and to bring about cultural change in the fashion industry towards fair trade and ethical consumption. Educators believe it is important to educate Bahraini school children in order to change their mindsets on fashion and consumption.



Maya Penn

1 BEFORE YOU WATCH Discuss in pairs.

1. Why do you think T-shirts are called T-shirts?
2. How many T-shirts have you got? Which one is your favourite? Why?
3. Why are T-shirts so popular all around the world?

2 Read and circle. You're going to watch *How Your T-shirt Can Make a Difference*. From the title, predict the purpose of the video. Circle the letter.

- a. To sell you popular T-shirts
- b. To show you how T-shirts are made
- c. To help you make good choices

3 WHILE YOU WATCH Listen and fill in an idea web. Watch scene 4.1.

4 AFTER YOU WATCH Work in pairs. Number the order in which the information appears in the video.

- _____ T-shirts use a lot of water and energy.
- 1 _____ Cotton is everywhere.
- _____ There is a solution. We can make a difference!
- _____ We haven't got as much water on the planet as we think.
- _____ Cotton has a major impact on the planet.

5 Work in pairs. How does the video suggest we can make a difference? Tick the boxes.

- ☐ Buy fewer T-shirts.
- ☐ Skip the washing.
- ☐ Stop drying clothes in the dryer.
- ☐ Skip the ironing.
- ☐ Buy clothes that aren't made of cotton.

6 Work in groups. Read about more ways to reduce your fashion footprint. Can you use any of these ideas to make changes? How?



7 YOU DECIDE Choose an activity. 21ST C

1. **Work independently.** Do a survey. Ask ten people how they reduce their fashion footprints. Present your survey results to the class.
2. **Work in pairs.** Write a short TV interview between a chat-show host and a designer. Ask and answer questions about the impact that the designer's clothes have on the environment.
3. **Work in groups.** Have a group discussion. What is the main purpose of fashion? Are there other purposes? Do fashion designers have a responsibility to help protect the environment? Why or why not?

Modals: Making suggestions and giving advice about present and past actions

You **shouldn't have bought** that leather jacket.
You **could have bought** that organic cotton jacket instead.
You **should be** more careful about reading labels.
You **could reduce** your footprint with a small change like this.

1 Read. Complete the dialogue with words from the list. Use *could*, *should*, *could have* or *should have*.

be	do	dry	hang	listen	put	wash	wear
----	----	-----	------	--------	-----	------	------

Mum: You shouldn't have washed your new T-shirt. You just got it!
Pat: But I wore it to lunch with my friends and I spilt soup on it.
Mum: You _____ more careful. And instead of washing your T-shirt all by itself in the machine, you _____ it by hand in the sink. That way you save water.
Pat: What do you mean?
Mum: Did you know it takes 40 gallons of water to wash that T-shirt in the machine?
Pat: That much? I really _____ it in there.
Mum: And you _____ it in the dryer, either. It takes more than five times the energy to dry that T-shirt than it does to wash it. From now on, you _____ it on the clothes line so that the sun dries it – for free!

2 Work in pairs. Take turns throwing a coin (heads = 1 space; tails = 2 spaces). Make suggestions and give advice about present and past actions as instructed.



Go to page 163.

When we write a cover letter to apply for a job, we need to think about the structure and include important information, such as:

your name and address	the employer's name and address	the date
a formal greeting	a subject line	a formal sign-off

1 Read the model. Work in pairs to identify the parts of the letter. Underline the sections listed in the green box above.

Sara Ahmed
PO Box 123
Kingdom of Bahrain

The Manager
Ethical Fashion
High Street
Kingdom of Bahrain

15th October 2022

Dear Sir/Madam,

Application for part-time shop assistant

I am writing to apply for this position which I saw advertised on your website. I am a secondary school student, and I am looking for part-time work to fit in with my studies. I am extremely interested in this position as I have always been enthusiastic about fashion and the environment. I think it is important to have more shops that sell eco-friendly clothes that help to educate and inform consumers about the choices they make. We should all do our part to reduce our fashion footprint, and shops like yours are an excellent choice for customers who want to know where their clothing has come from.

I am a self-confident, organised and responsible person. I enjoy meeting new people and talking about the latest designers and styles. I speak different languages, including Arabic, English and French. In addition, I have previous experience of working in a clothes shop. My manager was very satisfied with my performance.

As noted in my attached CV, I believe that my skills and personality are a very good fit for this position. I look forward to hearing from you.

Yours faithfully,
Sara Ahmed

2 Work in pairs. Does the writer persuade you that she is suitable for the job? Why or why not?

3 Write. Write a cover letter of 100–120 words applying for a part-time position in an ethical shoe shop. Explain why you want the job and why you are suitable for the position.



Make Good Choices

**'I believe in a hands-on approach.
Today we need everyone's involvement.'**

Asher Jay

National Geographic Explorer, Creative Conservationist

21ST C

1. **Watch scene 4.2.**
2. What are some things you can do by yourself or in your community to help protect animals used for fashion? To protect other animals?
3. What good choices can you make in your everyday life to protect the environment? Give at least three examples.

PROJECT

Make an Impact

YOU DECIDE Choose a project.

1 Plan and write a blog entry about reducing one's fashion footprint.

- Write the text.
- Collect photos and drawings.
- Share the blog and respond to questions and comments.

2 Under the supervision of your teacher, plan and hold an eco-friendly fashion show.

- Collect donated and found materials.
- Use the materials to design clothing and accessories.
- Have a fashion show and film it.

3 Plan and hold a Fashion Footprint Awareness Day.

- Make posters and brochures.
- Conduct interviews in the community.
- Report on the day's activities for the school newspaper.



Express Yourself

1 Read and listen to the poem by Asher Jay.  057

The Garb Age

Fashion is about excess,
about wanting more.
It's indulgent, vain,
selfish to the core.

5 Excess is euphemism
for avoidable waste.
Buying without need
is in poor taste.

10 In a finite world
resources are scarce.
Surplus drains, and
Earth has no spares.

15 Fads repeat like history,
dated becomes news.
Reduce, repurpose, recycle.
Up-cycle and re-use!

20 Fight a failing model.
Save scraps, set the stage.
Sew your own designs,
but don't let your garb age.

2 Work in groups. Discuss the poem.

1. What do you think the poem is about? Circle the letter. Support your answer.
 - a. buying trendy fashions
 - b. reducing your fashion footprint
 - c. buying only recycled clothing
2. The poem says we shouldn't buy things we don't need. Do you agree or disagree? Explain.

3 **Connect ideas.** In Unit 3, you learnt about group behaviours. In this unit, you learnt about fashion trends. What connection can you see between the two topics?

4 **YOU DECIDE** Choose an activity.

21ST C

1. Choose a topic:
 - fashion and group behaviour
 - clothing and its impact on the environment
2. Choose a way to express yourself:
 - a poem or chant
 - a poster
 - a short video
3. Present your work.

‘From flying dinosaurs to jet packs, the ability to soar among the clouds has always captivated our imagination.’

Ryan Carney

Flying High

TO START 21ST C

1. We all know that birds fly. What other living things fly? Make a list of as many as you can.
2. Why do you think humans have always wanted to fly?
3. Would you like to be able to fly? Why or why not?

Jetmen flying over the city of Dubai, United Arab Emirates

1 Which animal do you think was the first to fly? Why? Discuss. Then listen and read. 🔊 058

350 million years ago

Today it's hard to imagine an empty sky, but many millions of years ago, there was no **flight** of any kind. All life was **limited** to water or land. This included very **early** insects, which were the first animals to develop wings around 350 million years ago. How did wings **evolve**? The most accepted theory is that wings developed from structures that originally supported insects' ancestors as they moved in the water. Over time, these structures became larger and stronger. They turned into wings that first allowed insects to jump and then **glide**. Eventually, insects were able to **flap** their wings and fly.

229 million years ago

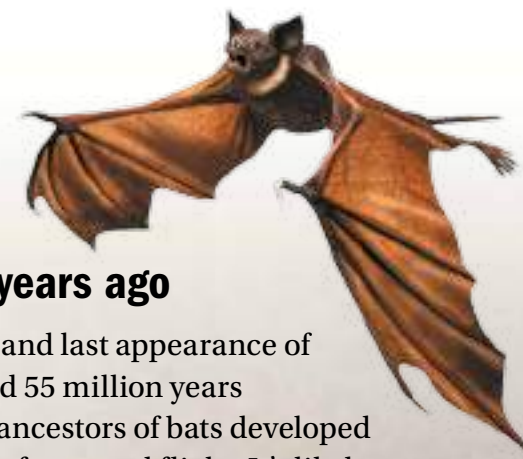
By 229 million years ago, flight had also developed in pterosaurs, large flying reptiles. These animals were not dinosaurs, but were closely related to them. They were good fliers because they had strong flight muscles, skin-covered wings and strong but **hollow** bones. They could glide, flap their wings and even **soar**, using the wind to help them stay in the air. The largest flying animal ever was a pterosaur named *Quetzalcoatlus*, which had a head as big as a human and a body as tall as a giraffe. *Quetzalcoatlus* had a **weight** of 200 kg. (440 lb.) and a **wingspan** of 11 m. (36 ft.)!

150 million years ago

Today's birds are actually living dinosaurs! The earliest known dinosaur that is generally considered to be the first bird is *Archaeopteryx*. It had feathered wings like modern birds, but also shared **features** with reptiles, such as teeth, clawed fingers and a bony tail. It could fly, but not very well. Later birds became more skilled fliers due to better flight **adaptations**.

55 million years ago

The fourth and last appearance of flight happened 55 million years ago, when the ancestors of bats developed the **capability** of powered flight. It's likely that these mammals lived in trees and first became gliders. Over time, their bodies formed wings, making bats the only mammals that have evolved to fly.



2 LEARN NEW WORDS Listen and repeat. 🔊 059

3 Work in pairs. The capability of flight has evolved in four groups: insects, pterosaurs, birds and bats. Why do you think each of these animals evolved to fly? How did it benefit them? Do you imagine any other animals evolving this way in the future? Explain.

4 Read and write the words from the list. Make any necessary changes.

adaptation	capability	evolve	flight
glide	hollow	limited	weight

As an evolutionary biologist and palaeontologist, Ryan Carney studies the history of dinosaurs and their modern-day descendants: birds. From a single feather, he was inspired to research the _____ that species made over time in order to fly. He is interested in *Archaeopteryx* because it was the earliest known dinosaur. *Archaeopteryx* was also the earliest species to _____ the _____ of powered flight. Ryan investigates the theory that _____ in birds originated from ‘the ground up’ (from ancestors that first ran on the ground), and not from ‘the trees down’ (from ancestors who lived in trees and then learnt to _____, before eventually flying).



Archaeopteryx feather fossil



Ryan Carney

5 LEARN NEW WORDS Listen to these words and match them to their definitions. 060 Then listen and repeat. 061

allow	powered	skilled	support
-------	---------	---------	---------

- _____ 1. to provide the capability to do something
- _____ 2. having the capability to do something well
- _____ 3. to carry the weight of something
- _____ 4. having energy to produce movement

6 YOU DECIDE Choose an activity. Work in pairs.

- List three insects that fly and three that don't. Compare the insects on the two lists. What are the advantages of flying for insects?
- With around 10,000 species in existence, birds have developed a wide variety of adaptations for flight. Compare and contrast two very different-looking birds. How is their flight similar? How is it different?
- Why do you think bats developed flight to use mainly at night? How are bats' flight adaptations different from those of other fliers?

SPEAKING STRATEGY 062

Arguing

I'm sure you agree that _____ .
Well, I think that _____ .
Most people support _____ .
Yes, but what about _____ ?

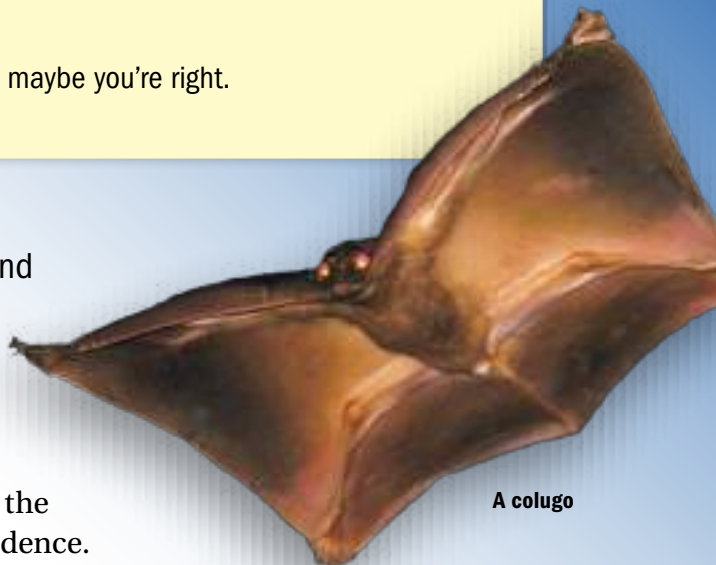
Conceding

I guess you have a point.
Well, maybe you're right.

1 Listen. How do the speakers argue their points and concede? Write the phrases you hear. 063

2 Read and complete the dialogue.

Ann: You know, we still don't know much about the ancestors of bats. There just isn't much evidence.
Alan: Maybe, but _____ the idea that bats are closely related to a group of mammals that also includes the colugo.
Ann: Yes, _____ the fact that the colugo glides? It doesn't flap its wings and fly.
Alan: Well, I _____ bats and colugos probably had an ancestor in common at some point. Think about it. I'm _____ that they share characteristics. Their wings look very similar. And both species eat insects. So it's logical that their ancestor would be a nocturnal glider who lived in trees.
Ann: I _____ there.



A colugo

3 Work in groups. Cut out the cards. Take turns reading them aloud. Group members argue and concede each point.

4 Work in pairs. What affects your own life? What do you want to change? Take turns arguing and conceding.



Go to page 165.

Most students support the idea of less homework. I do, too.

Yes, but what about preparing for tests? Homework can be useful for that.

Well, maybe you're right.

GRAMMAR 064

Past perfect: Talking about the first of two actions in the past

Pterosaurs disappeared.

Pterosaurs **had** already **disappeared** by the time modern birds evolved.

The capability of flight developed in four groups of animals.

By the time humans tried to fly, the capability of flight **had developed** in four groups of animals.

Humans tried to fly.

1 Listen. Which of the two actions in the past happened first? Tick the box. 065

- | | |
|--|---|
| 1. ☐ kite flight | ☐ animal flight |
| 2. ☐ running, arms flapping | ☐ kite flight |
| 3. ☐ measuring, signalling | ☐ human transport |
| 4. ☐ fun and entertainment | ☐ military use |
| 5. ☐ kites made of paper | ☐ kites made of silk |

2 Read and complete the sentences. Use past perfect forms of the verbs in the box.

design draw forget jump run try

Jumping from towers, walls and cliffs was among many ways humans tried to fly. Many men _____ to fly like the birds before success was achieved in 875 CE. In that year, a man named Abdul Qasim Abbas Ibn Firnas jumped from a high wall built over a valley in Córdoba, Spain. Before his experiment, he _____ wings covered in feathers. He planned to wear them on his arms and legs. Also, he _____ on paper a series of wing movements to use in flight. According to the people who saw his experiment, he began to fall after he _____. Afterwards, he climbed even higher than his starting point. He glided for several hundred feet, turned and came back to the wall. He hurt his back in the experiment, possibly because he _____ to include a tail in his design.

1000 BCE

The Chinese invent kites.



875 CE

Abbas Ibn Firnas wants to **prove** that man can fly. He tries flying by jumping with feathered wings.



1295

Marco Polo describes man-carrying kites.



1485

Leonardo da Vinci studies **forces** that affect objects in the air in order to design flying machines.



1595

Fausto Veranzio designs a **parachute**.

1670

Francesco Lana de Terzi designs an airship.



1783

The Montgolfier brothers launch hot-air balloons. These balloons **ascend** when the air inside is hot and **descend** when it cools.



1800

George Cayley designs the first **stable** glider to carry a human.



3 LEARN NEW WORDS Listen. Learn about the history of human flight. 066 Then listen and repeat. 067

4 Read the sentences. Tick T for True or F for False.

- Gravity is one of the forces that acts on flying and falling objects.
- Leonardo da Vinci designed his parachute in 1595.
- A stable flying object does not move from side to side.
- Da Vinci created a helicopter that ascended into the sky at an angle.
- A parachute can be used to help people descend safely from the sky.
- Experts proved that da Vinci's glider was almost the same as Cayley's.

☐ T	☐ F
☐ T	☐ F
☐ T	☐ F
☐ T	☐ F
☐ T	☐ F
☐ T	☐ F

5 Work in groups. Use the timeline and new words to make four true sentences about flight. Use the past perfect.

- _____
- _____
- _____
- _____

1 **BEFORE YOU READ** Discuss in pairs.

What do you know about the Wright brothers and flight? Make a list. What are three facts you expect to find in the reading? **21ST C**

2 **LEARN NEW WORDS** Find the words in the reading.

What do you think they mean? Then find the words *land*, *fuel* and *pilot* in a dictionary. Look at the different ways these words can be used. Then listen and repeat all of the new words. **068**

engine fuel land pilot take off

3 **WHILE YOU READ** Listen and read.

Notice the order in which events happened. **069**

Reaching FOR THE Sky

The Dream of Human Flight

One day while travelling, Milton Wright saw a small toy helicopter that was powered by rubber bands. He bought this toy for his two young sons, Orville and Wilbur. Mr Wright surely had no idea this simple act would lead to the creation of the world's first powered aeroplane. The toy gave the brothers a strong interest in flight. They soon began trying to build similar models themselves.

When they were older, the Wright brothers decided they wanted to make a 'small contribution' to the field of flight. At that time, most attention on flight focused on hot-air balloons and gliders. However, the brothers were more interested in a heavier flying machine, powered by an engine and controlled by a pilot. They first read all the books they could on the early mechanics of flight. Then they used kites to better understand the forces that controlled objects in the air.

Over the next three years, the Wright brothers worked on designs and shapes for different types of gliders. During this time, they worked with engineers Otto Lilienthal and Octave Chanute, both authors of books on flight. These men were important influences on the brothers' work.

The brothers had built a wind tunnel to test different shapes of wings and tails for their gliders. Then they began to think about how to get a flying machine weighing 272 kg. (600 lb.) into the air and keep it there. They designed a 12-horsepower engine that generated enough force to allow the Flyer to take off from the ground in December 1903. It ascended about 3 m. (10 ft.) into the air and continued to fly 36 m. (120 ft.) in about 12 seconds. The first heavier-than-air flight became a reality!

The second, third and fourth flights followed on the same day. But the Wright brothers observed that the Flyer was not stable enough and was hard to control. They spent two more years perfecting their aeroplane. Finally, on the 5th of October 1905, Flyer III flew about 39 km. (24 mi.) in 39 minutes. The plane landed only because it ran out of fuel.

Nearly a thousand years after Abbas Ibn Firnas's first attempt to fly, the dream of human flight had finally come true.



Otto Lilienthal builds a glider.



Octave Chanute's book on flying machines is published.



Samuel Langley creates his aerodrome model.



Alberto Santos-Dumont circles the Eiffel Tower.



The Wright brothers fly for 39 minutes in Flyer III.

4 **AFTER YOU READ** Work in pairs to answer the questions.

1. What is the main idea of the reading?
2. How did the Wright brothers prepare for their project?
3. Whose ideas on flight influenced the Wright brothers?
4. The Wright brothers worked on their flight project for years. What personality characteristics do you think they had that helped them reach their goals?

5 **Put the events in order.**

- _____ The Wright brothers built a wind tunnel to test the wings and tails of their gliders.
- 1 _____ They read everything they could about flight.
- _____ They flew Flyer III about 39 km. (24 mi.) before it ran out of fuel.
- _____ They designed a 12-horsepower engine to power the Flyer.
- _____ They used kites to learn more about how things fly.
- _____ They worked for two years to make the Flyer more stable.

6 **Discuss in groups.**

1. How do you think the Wright brothers' work helped shape the 20th century? What aspects of life changed?
2. Is just one person ever truly responsible for a great idea or invention? Do all ideas and inventions build on the work of previous generations? What do you think? Why?

In December 1903, Orville Wright takes off with his brother Wilbur running beside him.

1 BEFORE YOU WATCH Discuss in pairs. What makes bees different from other insects? Why are bees important?

2 Work in pairs. You're going to watch a video called *Flight of the RoboBee*. Based on the title and the photo, predict what the video is about.

3 WHILE YOU WATCH List three benefits that robotic bees will have. Watch scene 5.1.

1. _____

2. _____

3. _____

4 AFTER YOU WATCH Work in pairs. Tick T for *True* or F for *False*.

1. Robert Wood says that most new robots are large, powerful and dangerous.

T F
2. Robert's robots are inspired by nature.

T F
3. Robert looks at real insects to work out how to construct his robotic bees.

T F
4. Robotic bees haven't got the supports necessary to fly independently.

T F
5. Robert doesn't plan to send robotic bees into dangerous areas because they could break.

T F
6. Getting the robots to fly was a long, difficult process for Robert and his team.

T F

5 Discuss in groups. In the video, Robert says, 'If you don't fail, you don't learn enough.' Explain what you think he means by this.

6 Work in groups. You learnt about man's early attempts at flying. Compare and contrast the process of getting the robotic bee to fly with the processes of the flight pioneers you learnt about.

7 YOU DECIDE Choose an activity. 21ST C

1. **Work independently.** Research other robotic insects that are being developed. Choose one and create a short presentation on it. Explain what it's used for. Compare it with the robotic bee.
2. **Work in pairs.** Robert says that robotics is 'the next big thing to impact our lives'. Find an example of a robot that is making an impact on people's lives. Write an article about this robot and the impact it's having.
3. **Work in groups.** Create a poster to advertise robotic bees. Use illustrations and text to describe them, and explain why they are useful.

Robotic bees developed by Robert Wood, Electrical Engineer/National Geographic Explorer

GRAMMAR 070

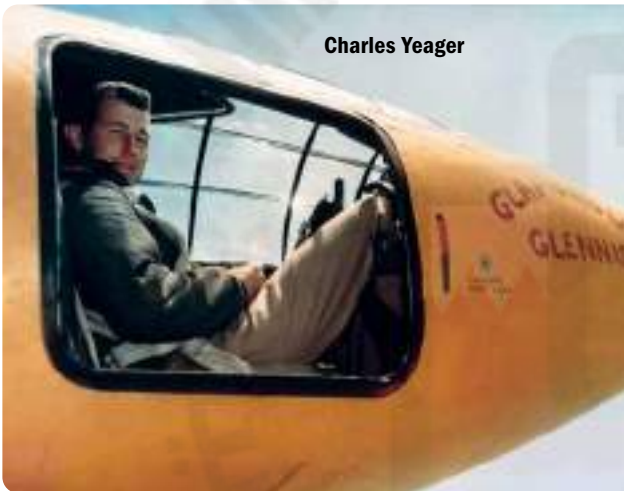
Past perfect continuous: Talking about the first of two actions in the past

The Wright brothers **had been working** on powered flight for several years before Wilbur Wright flew for 2 hours and 19 minutes in 1908.

Before Louis Bleriot first crossed the English Channel in an aeroplane in 1909, pilots **had been using** hot-air balloons.

1 Read. Complete the sentences with past perfect continuous forms of the verbs in brackets.

- 1. Otto Lilienthal _____ (use) gliders for around five years before he crashed in one in 1896.
- 2. Before Samuel Langley's large Aerodrome A crashed while taking off, he _____ (build) smaller machines that flew successfully.
- 3. Before Alberto Santos-Dumont made the first successful powered flight in Europe, he _____ (win) awards for his flights in balloons.
- 4. Engineer Frank Whittle _____ (work) on his theories for nine years before he tested his first jet engine in 1937.
- 5. Before Charles Yeager became the first pilot to travel faster than the speed of sound in 1947, he _____ (fly) for about five years.



2 Work in pairs. Take turns throwing the cube. Ask and answer questions. Use the past perfect continuous.



Before you became part of the team, how long had you been playing basketball?

I had been playing basketball for six years.

Go to page 167.

WRITING

When we classify, we organise our ideas into categories. First, we introduce the topic. Then we divide it into categories. Each category gets its own paragraph in the essay. In each paragraph, we describe shared characteristics that make up that category. A classification essay ends with a conclusion. In the conclusion, we bring the categories back together to talk about the main topic.

1 Read the model. Work in pairs to identify the categories and details.

Flying Machines

Long before we had aeroplanes, people had been experimenting with different flying machines. We still use some of those flying machines today. Some depend on air for movement, while others use engines.

Hot-air balloons and gliders use air currents for movement. Hot-air balloon pilots steer their aircraft by ascending or descending into air currents that move the balloon. The pilot controls the balloon's movement by heating the air inside the balloon, or by allowing it to cool naturally. A glider also uses air currents to soar and glide. Small planes pull gliders along a runway to help them take off. But once in the air, gliders use the currents, not an engine, to move. Their long wingspan and strong body give riders a safe, smooth flight. Hot-air balloons and gliders are most often used for fun and adventure.

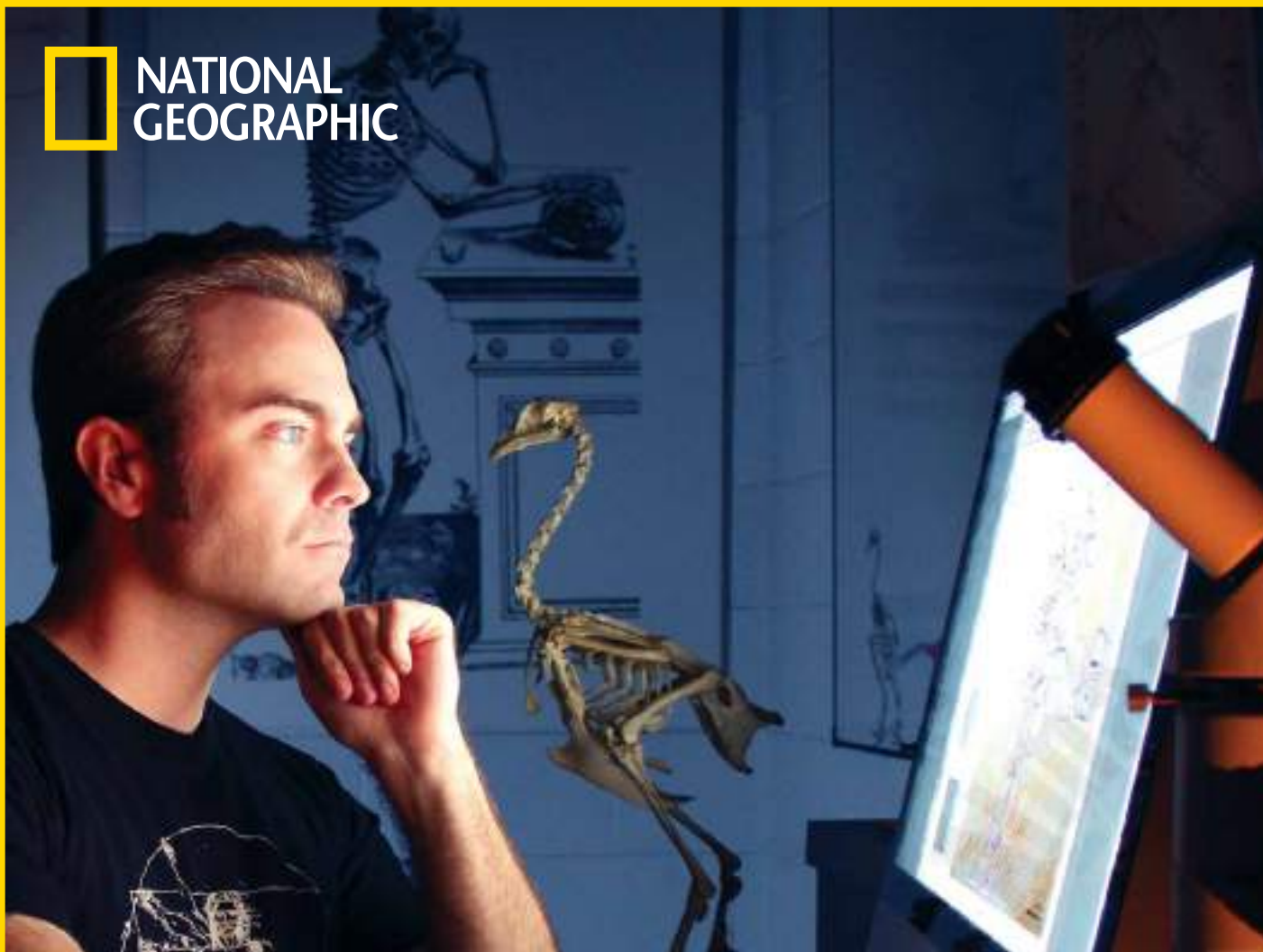
Helicopters first appeared during World War II. A helicopter hasn't got wings, but, like an aeroplane, it's got an engine that makes its blades spin at high speeds. This allows the helicopter to ascend into the sky. Unlike an aeroplane, which has to keep moving, helicopters can stay in one place in the sky for a long time. Today, helicopters are mostly used by medical teams and the military. But you can also take a helicopter ride for fun. Many tourist destinations offer helicopter rides for sightseeing.

So before your next plane ride, remember that planes aren't the only way to fly. Which type of flying machine would you most like to travel in?

2 Work in pairs. What does the writer classify? How many categories are there? What details are mentioned in each part?

3 Write. Write a classification essay of 110-130 words to describe two types of animal flight.





Explore Your Interests

‘As an evolutionary biologist, I get to combine both childhood interests into my research: dinosaurs and animation!’

Ryan Carney

National Geographic Explorer, Palaeontologist/Evolutionary Biologist

21ST C

1. **Watch scene 5.2.**
2. What are your interests? How have they changed over the years? Is there anything that you were interested in as a child that you are still learning about? What is it?
3. The people you read about in this unit, from Abbas Ibn Firnas to Ryan Carney, made their interests their life’s work. How could you turn your own interests into a career? What would you need to do?

PROJECT

Make an Impact

YOU DECIDE Choose a project.

1 Design a flying machine.

- Plan and design a flying machine.
- Use your plans to create a model of the machine.
- Present your machine to the class. Explain how it works.

2 Make an evolution poster.

- Choose an animal that has evolved the capability of flight.
- Research how this animal has evolved over time. Draw and label at least four steps in its evolution.
- Arrange your drawings in order on a poster. Display the poster in class.

3 Advertise a flying machine.

- Choose a flying machine that you learnt about.
- Think about the benefits and risks of using that machine.
- Make an advertisement for the machine. Try to persuade your audience to fly in it.



A pilot guiding a home-made machine during a flying competition in Moscow, Russia

New Frontiers

'We are pushing the frontiers in our own solar system, sending missions to other worlds, looking outward to distant pinpoints of light.'

Bethany Ehlmann

The Veil Nebula is a cloud of hot gas and dust in outer space. It's the remains of a star that exploded around 8,000 years ago.

TO START 21ST C

1. What can we learn from exploring outer space?
2. Bethany Ehlmann points out that we're sending missions to other worlds. One of them is our neighbouring planet, Mars. What other worlds should we explore? Why?
3. What personality characteristics do you think you need to participate in space exploration? Name at least three.

1 Recent space exploration has focused on Mars. Why do you think this is?

Discuss. Then listen and read. 🔊 071

We think of Earth as the *Blue Planet* and Mars as the *Red Planet* when looking at **satellite** images of them. Although they look very different, our home planet and Mars are actually similar in many **aspects**. Like Earth, Mars has its own **atmosphere** and clouds. Both planets have large, ice-covered areas called *polar caps*. Mars's **landscape** includes features

also found on Earth, such as mountains, **plains**, channels, craters and even volcanoes.

Both planets have days that are about 24 hours long, and both spin on an invisible line called an *axis*. Each planet tilts to the side on its axis, at an angle of about 24 **degrees** in relation to the sun. This tilt is what causes the seasons to change on both planets.

The Curiosity rover on the surface of Mars

Astronomers have always **wondered** if life exists beyond Earth. If it does, our neighbour Mars is the most likely place to find it. Mars is a planet of wild extremes. It has the largest **dust** storms, the deepest and longest **valley**, the highest mountain and the largest volcano known in our solar system! But to most planetary scientists, the biggest question is whether life is, or was, possible on the planet.

Advances in technology have allowed scientists to equip robots with a variety of tools and then send them to explore Mars. These scientific **instruments** have been

able to **detect** real **proof** that life is possible there. For example, one of the **fundamental** requirements for life, the existence of some form of water, has been discovered in several areas of Mars. A **vast** amount of ice is under the surface and also frozen in the polar caps year-round. In 2015, scientists confirmed that liquid water exists on Mars's surface. But will this finding **lead to** the discovery of life on the Red Planet? We're still waiting to find out.



Channels on Mars's surface suggest the presence of water.

2 LEARN NEW WORDS Listen and repeat.

🔊 072

3 Work in pairs. Why is it important that scientists find proof of water on Mars? Do you think that they will find life on the Red Planet? Why or why not?

4 Read and circle the correct word.

As a planetary geologist, Bethany Ehlmann studies our solar system. She *wonders / leads to* how the rocks on Mars were formed and how they interacted with water. She also is looking for *degrees / proof* that life could have been or could be present on the Red Planet. She works closely with Curiosity, a six-wheeled robot called a *rover*. Rovers can move around and explore. Curiosity travels through the plains and *valleys / aspects* on the surface of Mars. It uses scientific *dust / instruments* to analyse the Martian *proof / landscape*. Bethany hopes that Curiosity's work, combined with new technological advances, will one day provide the answer to the *fundamental / satellite* question: Is there life beyond Earth?



Bethany Ehlmann with a Mars rover

5 LEARN NEW WORDS Listen to these words and match them to the definitions. 073 Then listen and repeat. 074

advance	astronomer	equip with	requirement
_____	_____	_____	1. to provide
_____	_____	_____	2. progress in science or technology
_____	_____	_____	3. something that's necessary
_____	_____	_____	4. a person who studies the stars and planets

6 YOU DECIDE Choose an activity.

- Work independently.** Go online to learn more about the Curiosity rover's mission. Write a paragraph about what you learnt.
- Work in pairs.** Make a Venn diagram. Compare and contrast Earth and Mars.
- Work in groups.** Hundreds of years ago, adventurers spent years exploring countries and continents, leaving everything they knew behind them. If you knew you would spend years away, and maybe never return, would you explore Mars? Why or why not? Discuss with your group. Then share with the class.



SPEAKING STRATEGY 075

Speculating

Do you think that they'll ever find life on Mars?

Most likely, scientists will research the topic for a long time.

I'll bet they're close to finding life!

It's likely that they'll first find microbes.

I'm fairly sure that will change everything!

What if scientists really do find evidence of life?

1 Listen. How do the speakers speculate? Write the phrases you hear. 076

2 Read and complete the dialogue.

Mia: I just read a really interesting article about the Curiosity rover on Mars. By examining the soil, it helped scientists learn more about ancient Mars.

Lee: Well, _____ they had to dig really deep to find soil and rocks from ancient times.

Mia: That's not true. The article said that 50 per cent of the rock on Mars's surface is from ancient times.

Lee: So _____ that scientists can really learn much from studying some old rocks?

Mia: Well, yes. _____ these rocks hold information about the possibility of life on Mars. The samples that Curiosity collected show that the chemicals needed to support life were present on the planet.

Lee: _____ Curiosity discovers living creatures on Mars?

Mia: _____, we won't see photos of little green Martians, if that's what you mean. _____ if Curiosity can find proof of life, it will be microscopic organisms found in the icy regions.

3 Work in pairs. Take a card and look at the photo from Mars. Speculate about what you see. Your partner will read the correct information. Then swap roles.

What if this is food growing on Mars? I'll bet they'll try sending some back to Earth.

Actually they're mineral balls found on Mars's surface. I'm fairly sure that we won't want to eat them!



4 Work in groups. Speculate about the near future. How well are you going to do on your next test? How well is your favourite sports team going to do this year? How soon are you going to make a new good friend?

Go to page 169.

GRAMMAR 077

Present and past conditionals: Talking about unlikely (but possible) or impossible situations

Unlikely but possible

If I **were** a scientist, I **would focus** my research on Saturn.

He **would be** a space tourist if he **had** the money.

Impossible

If I **had known** there was a talk about Mars, I **would have gone**.

They **could have fixed** the rover if they **had equipped** it with better tools.

Habitable by Humans?

The planet Saturn is made up of gas, so it doesn't have a **habitable** environment. If scientists wanted to find life around Saturn, they would have better luck studying two of its moons: Enceladus and Titan.

3 LEARN NEW WORDS Look and listen. Learn about Saturn's moons Titan and Enceladus. 079 Then listen and repeat. 080

ENCELADUS

- 500 km. (311 mi.) in diameter
- one day = 1.37 Earth days
- temperature: -201°C (-330°F)
- atmosphere: very thin
- no weather
- **geysers** that send water vapour and pieces of ice into the sky

TITAN

- 2,575 km. (1,600 mi.) in **diameter**
- one day = 16 Earth days
- temperature: -179°C (-290°F)
- atmosphere: thick and **hazy**
- **seasonal** storm cycles
- surface lakes, seas of liquid methane

1 Listen. What's the reality in each case? Tick the box. 078

- | | |
|---|---|
| 1. ☐ I'm not president. | ☐ I'm president. |
| 2. ☐ The project succeeded. | ☐ The project failed. |
| 3. ☐ I investigated Titan. | ☐ I didn't investigate Titan. |
| 4. ☐ There is one space station. | ☐ There are two space stations. |
| 5. ☐ We repeated the experiment. | ☐ We didn't repeat the experiment. |
| 6. ☐ I don't explore space. | ☐ I explore space. |

2 Read. Complete the sentences with the correct form of the verbs in brackets.

Saturn has always been a fascinating planet. At about 1.2 billion km. (746 million mi.) from Earth, it was the most distant of the worlds recognised by ancient sky watchers. If they _____ (study) it the way we are able to today, they _____ (be) amazed. They _____ (find) that its rings consist of billions of icy particles. They _____ (discover) that these rings are extremely thin – only 10 m. (33 ft.) thick. And they _____ (learn) that some of the planet's small moons play an important part in controlling the orbits and spacing of the rings. If you _____ (study) Saturn's moons today, you _____ (observe) that some of its 62 moons orbit in opposite directions. You _____ (see) that some moons even exchange orbits. Most importantly, you _____ (learn) that two of the moons have the potential for life!

4 Work independently. Imagine you spent a year living on Titan and are now back home on Earth, telling a friend about it. Complete the sentences with present or past conditionals.

- If you _____ (have) the right equipment, you _____ (visit) Titan and be able to experience life on a moon.
- If you _____ (come) to Titan while I was there, would you _____ (swim) with me in a surface lake?
- If I _____ (know) you would be living on Titan, I _____ (remind) you about the seasonal storm cycles.
- If I _____ (be) on Titan today, I _____ (try) to take photographs of the storms.
- If Enceladus _____ (be) habitable by humans, I _____ (go) there next year.
- If I _____ (go) to Enceladus, I _____ (study) the geysers.

5 Work in groups. If you had to visit one of these two moons, which one would you choose? Why? Give two or three reasons.

If I could travel to one of Saturn's moons, I'd go to Enceladus to see the geysers.

- 1 **BEFORE YOU READ** Discuss in pairs. When we think of space, we think of astronauts. But there are many other types of jobs in any space mission. Other than astronauts, what other kinds of space-related jobs can you think of?

21ST C

- 2 **LEARN NEW WORDS** Find these words in the reading. What do you think they mean? Think about the parts of each word. Use a dictionary to check. Then listen and repeat. 081

aspiring	background	chance
leadership	perseverance	

- 3 **WHILE YOU READ** Listen and read. Think about the different categories that the information can be organised into. 082

- 4 **AFTER YOU READ** Work in pairs to answer the questions.

1. What is the main purpose of the reading?
2. Who is Alyssa Carson? Why is she mentioned in the reading?
3. What do you think happens at a space camp session?
4. Besides camp, what can aspiring astronauts do to prepare for space?

Astronauts-in-training testing a surface transport vehicle in the desert

More Than a Dream

Could space be your own new frontier?

Are you one of Earth's next generation of explorer-astronauts? What do aspiring astronauts do to prepare for the possibility of a career in space?

A good person to ask would be Alyssa Carson. Her dream is to be the first person on Mars. As a child, Alyssa read as much as possible about Mars, studied its maps, and did everything she could to learn about the Red Planet. This included going to a space-themed camp for the first time at age seven. Since then, Alyssa has attended more than 20 such camps. In fact, at age 13 she was the first person ever to complete all the NASA Space Camps in the world. At these camps, future astronauts get the chance to ride in space-flight simulators and experience what zero gravity feels like.

While Space Camp may not be possible for everyone, there are many other ways to prepare for a future in space. If you're interested, consider the following:

- Astronauts must be in excellent physical condition. Now's the time to begin a healthy lifestyle of a balanced diet, regular exercise and plenty of sleep.

- Astronauts need to meet a wide range of physical challenges. Skills acquired through activities such as scuba diving, skydiving, skiing, mountain climbing and piloting aircraft are extremely valuable. Now's a great time to start learning these types of skills little by little.
- Astronauts need to meet a wide range of emotional challenges. Work on developing positive traits, such as patience, co-operation and perseverance. Take every opportunity to practise team-building, leadership and problem-solving skills.
- Astronauts need to have a strong background in maths and science. Work with your school's advisers and mentors to determine the best subjects to study. Keep up with real-time developments and discoveries in space.
- Don't forget languages! In addition to English, you'll need to know other languages such as Russian and Chinese to communicate successfully.



Alyssa Carson

- 5 **Work in pairs.** Classify the types of challenges astronauts face. Give examples of each type.

6 **Discuss in groups.**

1. Of the challenges astronauts face, which do you think are the hardest? Why?
2. Alyssa Carson is preparing for her dream career as an astronaut. What's your dream career? What can you do now to prepare for it?
3. One day, humans may live in space colonies. What would an ordinary family's typical day be like in a space colony? Would you like to live in a space colony? Why or why not?

1 BEFORE YOU WATCH Discuss in pairs. You've learnt about the possibility of life beyond Earth. What are three characteristics of places where life is considered to be possible?

2 Read and circle. The video you're going to watch is called *Europa: Ocean World*. Based on what you've learnt in this unit, predict what the video will be about. Circle the correct letter.

a. another world with an ocean
b. an ocean near Europe
c. a new world discovered by Europeans

3 WHILE YOU WATCH Think about the requirements for life. Circle the ones you hear mentioned in the video. **Watch scene 6.1.**

energy	gases
liquid water	plants
substances found in rocks	warm temperatures

4 AFTER YOU WATCH Work in pairs. Circle the correct answer.

- Kevin Hand says that life on Earth may have begun in our *oceans / caves*.
- Where you find liquid *lava / water*, you generally find life.
- Europa's ocean has existed for *ten thousand / billions of* years.
- Earth / Europa* has more water and deeper oceans.
- Scientists used to think that for a world to be habitable, it had to be *the right distance from / in orbit around* the sun.
- Now scientists realise that life is possible wherever there are the key elements for life: water, energy and the building blocks found in *plants / rocks*.



This illustration shows what scientists believe is a global liquid ocean under Europa's surface. Jupiter (right) and another of its 67 moons, Io, are in the background.

5 Work in pairs. You've learnt about three moons so far in this unit. Compare and contrast Europa with Titan and Enceladus. How are they the same? How are they different? Create a diagram to show your ideas.

6 Work in groups. To answer the question of whether there is life in Europa's oceans, scientists must collect information from those oceans. Name two challenges scientists face in gathering that information.

7 YOU DECIDE Choose an activity. 21ST C

- Work independently.** Learn more about Europa. Use the information you collect to design and label a model of Europa. Present it to the class.
- Work in pairs.** Imagine that life has just been discovered on Europa. Write and illustrate a newspaper article explaining how that happened and what was found.
- Work in groups.** Imagine you work for a research group that studies Europa and you're trying to get people to support your work. Prepare and give a presentation explaining why it's important to study Europa. Persuade your audience to support your work.

GRAMMAR 083

Adverbs: Comparing how things are done

The new satellite transmits data efficiently .	The new rover travels fast .
The last satellite didn't transmit data as efficiently as the new satellite.	The last rover didn't travel as fast as the new rover.
The new satellite transmits data more efficiently than the last satellite.	The new rover travels faster than the last rover.
The new satellite transmits data the most efficiently of all the satellites.	The new rover travels the fastest of all the rovers.

1 Complete the sentences. Use the correct form of the adverbs in brackets.

Astronomers had dreamt of a telescope that would photograph the universe _____ (clearly) than telescopes on the ground could. That dream came true in 1990 when the Hubble Space Telescope was launched into orbit _____ (approximately) 612 km. (380 mi.) above the Earth.

Hubble has photographed some of _____ (spectacularly) beautiful images of space ever taken. But that's not all. It has _____ (greatly) expanded our knowledge of space. Before Hubble, astronomers could not estimate the age of the universe _____ (precisely) they can now. Because of what they've seen through Hubble, astronomers have estimated that the universe is around 14 billion years old.

What's after Hubble? The Webb Space Telescope, which will measure distant objects even _____ (accurately) than Hubble.



2 Work in groups. Spin each wheel. Take turns comparing how group members do or have done different activities using the words from each spinner.

I have been speaking English as long as you.

Yes, but Camille has been speaking English the longest!



Go to page 167.

WRITING

One way to organise persuasive writing is to present both sides of an argument, point by point. First describe one argument and then present a counter-argument in the same paragraph. Do the same for additional arguments and paragraphs, presenting counter-arguments each time.

1 Read the model. Work in pairs to circle one side of the writer's argument and underline the counter-argument. Do this for each point.

Developing Spacecraft vs. Developing Robots

It's extremely important to develop new technology wisely, so that everyone can benefit from it. Some people believe our technology plan should focus on building spacecraft. Others believe it should focus on building robots. Which is the better course of action?

For those who dream of exploring outer space, the development of high-tech spacecraft is essential. But just one spaceship costs billions of dollars more to build than even the most complex robot. Many specialised robots could be designed and built much more cheaply than spaceships, and they could be used for practical purposes right here on Earth.

Many of the people who focus on future space exploration describe solving key mysteries of space and perhaps even the origin of life in the universe. While this kind of knowledge is fascinating, there are no practical benefits from it for people on Earth right now. Robots will have new applications in the future, but even the robots we currently have benefit us in practical ways. For example, they can work in dangerous conditions, such as places with extreme temperatures. They can take apart bombs, build products or perform complex surgery – all useful things that benefit people right now.

To sum up, it's clearly better to give attention, time and money to the technological development of robots. They are less expensive to develop and more useful. Robots also benefit people in ways that are more practical than any benefit from a spacecraft.

2 Work in pairs. In your opinion, which of the two positions on technological development is more persuasive? Why?

3 Write. Write an essay of 110–130 words about the argument that it's better to explore the ocean than outer space. Present both sides of the argument and persuade your readers to agree with you.

A flying robot that may be used for security, rescue and even space exploration



Discover the Future

‘Technology development is a huge part of our exploration and our ability to access the stories and the discoveries on other worlds.’

Bethany Ehlmann

National Geographic Explorer, Planetary Geologist

21ST C

1. **Watch scene 6.2.**
2. Bethany uses technology to explore Mars without being there. Where else can you explore using only technology?
3. Do you believe that people will live on Mars in the future? Why or why not? What would be the advantages and disadvantages of creating a colony there?

PROJECT

Make an Impact



YOU DECIDE Choose a project.

1 Design and write a postcard from outer space.

- Research one of the places mentioned in this unit to learn more about it.
- Imagine you took a week-long journey to this place. Write a postcard message about your trip. Include information on travelling to and from your destination.
- Find a photo of the place. Create your postcard by sticking your photo on one side and your message on the other.

2 Plan a space mission.

- Choose a place in outer space that you would like to explore.
- Design a space mission to explore that place. Write about what you would need and what you would want to find out about.
- Give a speech to the class presenting your idea. Persuade your listeners to support your mission.

3 Create an outer-space TV programme.

- Write a script for a TV programme whose characters live in outer space.
- Work in groups to rehearse the script.
- Film your programme and share it with the class.

Express Yourself

1

Read and listen to a scene from a film script about a team of space explorers.  084

5

FADE IN:
EXTERIOR SPACESHIP IN ORBIT AROUND MARS

FADE TO:
INTERIOR SPACESHIP MAIN CONTROL ROOM - NIGHT

MARK and SONIA, with torches on, come through the doors and stop in front of a bank of dimly lit active computer screens.

10

MARK
OK, we're here alone. Now show me what you're talking about.

15

SONIA
Look at screen seventeen.
Something strange is going on.

20

MARK
I don't see anything unusual.

25

SONIA
Look at the top right corner.

Mark catches his breath as he leans in to examine the top right corner of the computer screen.

30

MARK
(turning to look wildly at Sonia)
That's impossible!

35

SONIA
I know. But it's there.

25

MARK
I can't believe it! We need to wake up the mission commander right now.

30

SONIA
Don't panic. We need to think.

35

MARK
Are you joking?
What's there to think about?

Sonia takes a deep breath. Then she looks directly into Mark's eyes.

40

SONIA
Mark, I don't trust him.

- 2

Work in groups. In this scene, two astronauts see something very unusual on their screen. What do you think they see? List three possibilities. Then compare your ideas with those of another group. Are your ideas similar? Which idea is the most surprising?
- 3

Connect ideas. In Unit 5, you learnt about the history of flight. In Unit 6, you learnt about space exploration. How did the early pioneers of flight set the stage for space exploration? Discuss the evolution of flight that led to spacecraft.
- 4

YOU DECIDE Choose an activity. **21ST C**
 - Choose a topic:
 - flight
 - space exploration
 - Choose a way to express yourself:
 - the next scene of the film script
 - a presentation on flight (including spacecraft)
 - an original film or play
 - Present your work.

Visual Stories

‘Photography and filmmaking are very powerful ways to give people other ideas and other things to think about.’

Ami Vitale

TO START 21ST C

1. The title of this unit is *Visual Stories*. Look at the photograph. What story does it tell?
2. Photographer Ami Vitale uses photography to give people new ideas and new things to think about. Should this be the goal of all photographers? Why or why not?
3. In addition to photography and filmmaking, what other kinds of visual arts tell stories?



A museum worker moves *La Bella Principessa*, which many believe was painted by Leonardo da Vinci.

1 Why are stories important? How are they told? Discuss. Then listen and read. 🔊 085

Stories have been a **meaningful** form of communication throughout human history. Do you remember a time when a family member told you a story without reading it from a book? **Oral** stories are a part of every culture, and they allow us to pass traditions and values from one generation to the next. **Visual** stories have also been told in a variety of ways for thousands of years. Researchers have found rocks that were decorated by humans more than 100,000 years ago. Although the rocks had only simple linear patterns, the patterns had meaning. And it's meaning that creates a story.

People began painting on cave walls around 40,000 years ago. As time went on, painted **images** appeared on everything from pottery to **canvas**. Painting is a fairly permanent way to **represent** information. Because painted walls and objects have lasted for thousands of years, they give us a window into the past. Through this window we can see the stories of ancient Egyptians on the walls of their tombs. We can also see **scenes** from Renaissance Europe, showing the lives of people from kings to commoners. These paintings allow us to be **witnesses** to history.

In the 11th century, the Iraqi scientist Ibn Alhaitham built the first *camera obscura*, a device that forms the basis of photography. His work on light and vision continues to influence our world today.

By the early 19th century, French artist Louis-Jacques-Mande Daguerre introduced a device that provided another way to tell visual stories: the *daguerreotype*. This early camera was first used to take **portraits**. Photography with other subjects eventually became popular, but it took a while. At first people were afraid of a camera's ability to capture real life!

Today, photographers like Ami Vitale use photos to **portray** how people live. Ami presents her photos in ways that create certain responses from her **audience**, such as **anger** or **shock**. 'Photography creates change,' she says. Ami hopes that by telling her **subjects'** stories visually, she'll get people to realise that we're more alike than we are different. This will create a greater **understanding** among people around the world.

Visual stories are told on the walls of the tomb of Queen Hatshepsut, Egypt.

2 LEARN NEW WORDS Listen and repeat.

🔊 086

3 Work in pairs. Have you got a favourite painting? A favourite photograph? Describe one, and the story it tells, to your partner.

4 Read and write the words from the list. Make any necessary changes.

anger	audience	meaningful	portrait	portray
scene	subject	understanding	visual	witness

Ami Vitale is known for the way she _____ international news and culture in her photos. Ami worries that some people may not have a good _____ of one another’s cultures, so she creates _____ stories to make us think about how we see others. She believes that photographs can make us _____ to things that we wouldn’t see otherwise. Photos can show people and places in a _____ new way. Ami wants her _____ to look closely at her powerful photos and feel more connected to their _____, even if they then feel emotions like _____ or sadness.



5 LEARN NEW WORDS Listen to these words and match them to their definitions. 087 Then listen and repeat. 088

capture	certain	last	permanent
---------	---------	------	-----------

- _____ 1. to record something in pictures or words
- _____ 2. particular, specific
- _____ 3. never ends or goes away
- _____ 4. to exist over time

6 YOU DECIDE Choose an activity.

- Work independently.** Research cave paintings or images from Egyptian tombs. Choose a selection and write a paragraph to describe the story it tells.
- Work in pairs.** Bring a photo from home that you feel tells a clear story. Ask your partner to tell the story he/she sees in your photo. Then tell your partner the real story.
- Work in groups.** Who are some well-known painters in your country? Do their paintings tell stories? If so, what stories do they tell? Discuss.

SPEAKING STRATEGY 089

Explaining a process

First, you need to find a good camera.
The next step is choosing a good location.
After that, you need to pack the right equipment.
Next, check the weather!
Meanwhile, check to see that you have enough space on your computer.
Make sure you save your photos when you’ve finished.



1 Listen. How does the speaker explain the process of sharing photos? Write the phrases you hear. 090

2 Read and complete the dialogue.

- Aki: Hi, Uncle Moto. I see you have your new phone. Have you got any selfies on it?
- Uncle Motohiro: Selfies? What are those?
- Aki: Seriously? They’re photos you take of yourself on your phone.
- Uncle Motohiro: What? How do you do that?
- Aki: _____, you have to open the camera app on your phone. _____ is to press the little button with the arrows on it. That will turn the camera on you.
- Uncle Motohiro: OK, then what?
- Aki: It’s selfie time! Stretch your arm out in front of you as far as you can. _____ point the lens at your face. Hold your face at an angle – it’s more interesting that way. _____, hit the button to take your photo!
- Uncle Motohiro: Ugh! It’s terrible!
- Aki: Ha! That’s what the delete button is for!

3 Work in pairs. Take turns spinning the wheel and explaining processes.

4 Work in groups. Think of three things you typically do in a week that can be explained as processes, such as making your lunch or getting ready for school. Explain these processes. Do your group members do these things in the same way?



Go to page 171.

GRAMMAR 091

Past passive: Describing past actions and processes

Goya created many of his works at night, by the light of a hat that had candles on it.

Painters explored many different styles.

Artists usually made paint by mixing colours with oils.

Many of Goya's works **were created** at night, by the light of a hat that had candles on it.

Many different styles **were explored** by painters.

Paint **was** usually **made** by mixing colours with oils.

- 1 **Listen.** Learn about portraits and the stories they tell. Then circle the verbs that you hear used in the past passive. 092

ask	capture	create	die	display	do	invent
make	pay	require	spend	take	use	work

- 2 **Work in pairs.** Use the words to ask and answer questions in the past passive.

1. *Mona Lisa* / paint / da Vinci
2. Flyer III / build / Wright brothers
3. cave paintings / create / early humans
4. the first *camera obscura* / build / Ibn Alhaitham

Who painted the *Mona Lisa*?

The *Mona Lisa* was painted by Leonardo da Vinci.

- 3 **Work in pairs.** Look at *Portrait of a Young Woman*. Then answer questions using the past passive.

1. Who painted the portrait? _____
2. What was worn by the subject? _____
3. What do you think the subject was asked to do by the painter? _____



Portrait of a Young Woman
by Jean-Étienne Liotard

- 4 **LEARN NEW WORDS** Listen to learn more about painting. 093 Then listen and repeat. 094



A **landscape** painting shows a scene from nature.



Although their subjects are often simple, still-life paintings can be **masterpieces**.



Some portraits aren't **realistic**. They're **abstract**.

- 5 **Discuss in groups.**

1. Do you prefer realistic or abstract paintings? Why?
2. Can landscapes and still-life paintings be abstract? Why or why not?
3. Discuss two works of art you consider masterpieces.

- 6 **Work independently.** Use the past passive to describe how you think one of the works of art on these pages was created. Write at least four sentences.

BRINGING STORIES TO LIFE

HOW ANIMATION HAS CHANGED OVER THE YEARS

Do you love playing video games with really cool graphics? Or watching action films with amazing special effects? Thanks to advances in digital technology, modern animation can create detailed, lifelike images that move around the screen at incredible speeds. We experience animation in so many different forms, from the cartoons on our TVs to the

emojis on our smartphones. But animation is nothing new. In fact, people have been trying to bring images to life for hundreds of years.

The earliest animation began in the 17th century with a device called the magic lantern. In the 19th century, other devices were developed that created movement when viewers spun them. By the turn of the

20th century, artists around the world were developing short animated films using hand-drawn animation. Illustrators would create thousands of drawings for a single cartoon!

Throughout the 20th century, animators continued to develop different methods, from drawings to using clay figures. By the 1980s, digital animation was being developed. It

quickly replaced traditional methods because it allowed cartoons to be produced in less time and with less money. Today, advanced digital animation methods aren't just used in cartoons and video games, but also to create special effects in live-action films. Animation has become so sophisticated that sometimes we can't distinguish it from reality!

1650s

The magic lantern uses the light of a candle and painted pieces of glass to create moving images projected onto a wall. It becomes more sophisticated over time.



1832

The *phenakistoscope* is considered by many to have created the first true animation. To watch the animation, the viewer holds up a mirror and spins two illustrated disks. The spinning motion makes the illustrations seem to move.



1834

The *zoetrope* also uses a spinning motion to create animation. It quickly becomes more popular than the phenakistoscope because more than one person can watch at a time.



1891

American inventor Thomas Edison creates the *kinetoscope*. Viewers must look into the machine to watch a cartoon, which lasts about 13 seconds and contains around 50 images.



1917

Argentine animator Quirino Cristiani creates the first animated film, *El Apóstol*. The film has 58,000 illustrations and is 70 minutes long.



1928

Mickey Mouse is born. Walt Disney changes animation forever by adding sound. *Steamboat Willie* was the first cartoon in which viewers could hear what was happening.



1980s – present

Digital animation is first developed in the 1980s. Today, sophisticated 3D animation is used for cartoons, video games and even live-action films.



1 BEFORE YOU READ Discuss in pairs.

Which animated TV programmes and films did you watch as a child? **21ST C**

2 LEARN NEW WORDS Find these words in the reading. What do you think they mean?

Use a thesaurus to find synonyms for each word. Then listen and repeat. **095**

animation	cartoon	illustrator
method	sophisticated	

3 WHILE YOU READ Listen and read. Underline each of the different methods of animation mentioned in the text. **096**

4 AFTER YOU READ Work in pairs to answer the questions.

1. How was animation created with a magic lantern?
2. Name two differences between a phenakistoscope and a zoetrope.
3. How many drawings did Quirino Cristiani use to create the first animated film? How long was it?
4. How did Walt Disney's *Steamboat Willie* cartoon change animation?
5. Why did digital animation replace traditional methods?
6. What are two ways that 3D animation is used today?

5 Work in pairs. Compare the words and phrases you underlined in Activity 3 with your partner. Then summarise how each method was used to tell a visual story.

6 Discuss in groups.

1. If you had to animate a story, which method would you choose? Why?
2. Go online to watch *Steamboat Willie*. Describe the cartoon in your own words. Compare it with cartoons that children watch today.

1 BEFORE YOU WATCH Discuss in pairs.

In the reading, you learnt that most modern animation is digital. How do you think digital animation is made? Describe the process.

2 Read. You're going to watch a video called *Animation Creation*. Look at the storyboard on this page and read the three sentences. Which idea do you think will be most related to the video's content? Circle the letter.

- An animation is created more quickly than a live TV programme because there's little to prepare.
- Animations are popular because they're easy to make and cost very little money.
- Creating animations is a process that requires careful planning and decision-making.

3 WHILE YOU WATCH Create a flowchart showing the steps for creating an animation. Watch scene 7.1.

4 AFTER YOU WATCH Work in pairs to answer the questions.

- Who are the people involved in making the animation?
- What is the purpose of a mood board?
- What are the three stages of creating an animation?
- What is added at the animatic stage?
- What is the last step in creating an animation?



5 Work in pairs. In the video, the editor gives suggestions to the illustrator. What does she suggest? Tick the boxes. Then discuss how each suggestion would be helpful.

- ☐ Rewrite the script.
- ☐ Use cooler colours.
- ☐ Change the style of the characters.
- ☐ Design three different storyboards.
- ☐ Change the music.

6 Work in pairs. Compare the steps you created in your flowchart from Activity 3. Talk about what happens at each step. Do you think this happens with all of the animations you watch? Explain.

7 YOU DECIDE Choose an activity. 21ST C

- Work independently.** Imagine you're a TV producer who's looking for an illustrator to create animations for a programme. Write an advertisement for the job. Explain what personality traits the illustrator needs. Describe the type of work the job requires.
- Work in pairs.** Find an animated video online and watch it without the audio. Create a new script and choose music for the video. Then play the video for the class, using your own narration and music.
- Work in groups.** Research a live TV programme you like and find out how it's produced. Create a Venn diagram to compare the process with the production of an animation. Present your comparison to the class.

GRAMMAR 097

Reported speech: Describing what others say

'I will save my money for art supplies because I'm learning to draw comic strips.'	She says she will save her money for art supplies because she's learning to draw comic strips.
'Plan your ideas first.'	She said she would save her money for art supplies because she was learning to draw comic strips.
'Can I borrow your pencil?'	The teacher tells/is telling/told them to plan their ideas first.
	He asked if he could borrow my pencil.
	He asked to borrow my pencil.

1 **Listen.** You will hear how to draw a comic strip. After you listen, circle the word to correctly complete the sentences. 098

1. The speaker says that you first *have / had* to plan.
2. He tells us *to choose / chose* a story.
3. He said that the next step *is / was* to create a storyboard.
4. He tells us *not to worry / don't worry* about creating a perfect storyboard.
5. He told us we *can / could* scan the drawing, but that we *will / would* need special software to edit the work.
6. Then he asked us what we *think / thought*.

2 **Work in pairs.** Listen to the audio again. Then answer the questions using reported speech. 099

1. What did the speaker tell us about the process of making a comic strip?

He told us it took a lot of time.

2. What did he say about creating characters?

3. What did he tell us to do after the storyboard is complete?

4. What did the speaker ask us at the end?

3 **Work in large groups.** Cut out the cards and use them to play *Telephone*. Use reported speech.

She told me to use quality pencils and pens for drawing.

'Use quality pencils and pens for drawing.'

Go to page 173.

WRITING

When we write stories, we often describe what others say. To do this, we can use reported speech. We can also surround the person's statement or question with quotation marks. Look at the following examples:

Annie asked if I was going to eat the apple.
'Are you going to eat the apple?' asked Annie.
Gil says it's a wonderful idea.
'It's a wonderful idea,' says Gil.

1 **Read the model.** Notice how the writer quotes people in the story. Underline examples.

Fishing With My Grandfather

Whenever I look at this photo, I think of an afternoon fishing with my grandfather. My grandfather loves fishing. When we were younger, he tried to get my brother and me excited about it. 'It's a wonderful way to spend the afternoon together,' he told us. Every Saturday he asked us to go with him. At first we would, but fishing seemed so boring to us. Eventually, we told him that fishing wasn't our thing. After that, he would go alone.

One Saturday afternoon not long ago, I changed my mind and decided to go with him. I thought that maybe I would enjoy fishing more now that a few years have passed. So down to the water we went. We got in the water, threw the line and waited. And waited. After three hours all we had was a single tiny fish.

'Grandpa, why do you like standing out here for hours like this?' I asked. 'You've done nothing all afternoon!'

'Well,' he said. 'When I was a boy, fishing wasn't "nothing". In fact, it was everything. I didn't have TV, or video games or smartphones. So I fished. Now, when I fish, I go back to being that boy. It was a happy time.'

This photo really changed how I see my grandfather. I don't just see a quiet older man, but rather somebody who has seen many changes and has had many experiences. Looking at the photo also reminds me that my opinion of fishing changed that afternoon. Straight after I took the picture, Grandpa felt a strong pull on his line. In an instant, the two of us were struggling to bring in the biggest fish I had ever seen! It was really exciting. From then on, I went fishing with him whenever I could.

2 **Work in pairs.** What story does the photo tell? How does the photo change the writer?

3 **Write.** Choose a photo of a friend or family member. Write the story your photo tells in 120-140 words. Use reported speech and quotations to tell what people said.



Tell Stories

'It's about getting close to people, listening and looking intimately at life and the world we live in. It's about telling meaningful stories that will create awareness and hopefully inspire change for the better.'

Ami Vitale

National Geographic Photographer

21ST C

1. **Watch scene 7.2.**
2. Ami Vitale uses photography to tell other people's stories. What are some ways you can find out about people's stories? How can you tell them?
3. Think of a time when someone's life changed because another person told his/her story. Summarise what happened. Then discuss why people need to tell one another's stories.

PROJECT

Make an Impact

YOU DECIDE Choose a project.

1 Create a flipbook.

- Assemble a small book. Draw on each of the pages to create an animation when you flip it.
- Share your book with the class. Describe the story it tells.
- Explain the process of making your book. Answer your classmates' questions.

2 Profile a visual storyteller.

- Go online to research visual storytellers. Select one to profile.
- Create a computer presentation about the person's life and work. Show examples of visual stories this person has told.
- Present your work to the class.

3 Tell your own visual story.

- Think of a cause or person that is important to you. Think of the story you want to tell about this subject.
- Choose a format for your story. You might choose to draw, paint, animate or use photographs.
- Create your visual story and share it with the class.

A flipbook



Austrian BASE jumper Felix Baumgartner jumps from the edge of space, 39 km. (24 mi.) above the surface of the Earth.

Why We Explore

‘We really need to show people the world in a different light, in a new format – something that they can engage with and be excited about.’
Corey Jaskolski

TO START **21ST C**

1. In the photo, we see a man jump from the edge of space and then free-fall, attached only to a helium balloon. Would you try this? Why or why not?
2. Why do you think people explore? What can be learnt from exploring new places?
3. Where would you like to explore? Explain.

1 **Why do we explore?** Discuss. Then listen and read. 🔊 100

The desire for **knowledge** about our world pushes explorers into the smallest caves, the deepest oceans and even outer space. People have been exploring for centuries. But any explorer will tell you that the more they **investigate**, the more they realise there's still so much to learn.

Explorer Sylvia Earle is a deep-sea **pioneer** with a long list of achievements. She has engaged in 7,000 hours of underwater study and written nearly 200 scientific articles on her findings. In 1970, she and a team of women 'aquanauts' were required to live underwater for weeks at a time to **research** marine life. The fact that so much of the ocean remains undiscovered **has driven** Sylvia's work. In fact, even though explorers have been studying the world's oceans for years, they've only seen about five per cent of them! Sylvia's **purpose** in life has been to protect the sea, and she encourages others to do so as well.

Palaeoanthropologist Lee Berger has been searching for ancient remains in **remote** parts of Africa for over two decades. He is **curious** about the origins of human beings. Lee has made some **exciting**

discoveries over time, but his most important discovery came in 2014 when he led an expedition at the Rising Star cave system, near Johannesburg, South Africa. To explore one of the caves, researchers had to squeeze through an opening less than 25 cm. (10 in.) wide. Lee wasn't small enough to do it himself, so he gathered an **expert** team of female researchers who made it inside. There they found over 1,550 bones, representing at least 15 individuals.

The bones were brought to the lab where skeletons were assembled. Lee used 3D scanning to identify an entirely new species. Creating the skeleton was just the first step in understanding the new species. 'The discoveries we're now making show that, in some ways, the age of exploration is still just beginning,' says Lee.

Engineer and inventor Corey Jaskolski not only explores, but also creates **high-tech** tools that allow people to **look into** the past without harming its artefacts. Corey wants explorers to protect what they **encounter** so that future generations can learn from them, too. 'When we discover things, we have a responsibility to preserve them as well,' he says.

Scientists working inside the Rising Star cave.

2 **LEARN NEW WORDS** Listen and repeat. 🔊 101

3 **Work in pairs.** Why do you think each explorer's contributions are important? How does an explorer's work matter to all of us?

4 Read and write the words from the list. Make any necessary changes.

curious	drive	encounter	exciting	expert
high-tech	investigate	knowledge	purpose	remote

Corey Jaskolski is an _____ engineer and inventor whose _____ inventions are helping explorers – and ordinary people – to see the world in a different way. For example, his underwater robotic cameras can get high-resolution photos of very _____ parts of the ocean. These devices were used to _____ and film the *Titanic* shipwreck. Corey has also developed 360-degree viewers for the _____ of allowing people to explore _____ places, such as King Tut’s tomb, just by moving their mobile devices! Corey also has created night-vision cameras and 3D camera traps that help photographers capture images of animals without disturbing them. Conservation is what _____ much of Corey’s work. His equipment can be used to gain _____ about places or animals without harming them at all. Corey wants to protect what’s here on Earth so that future generations can enjoy exploring just like he does.



5 LEARN NEW WORDS Listen to these words and match them to their definitions. 102 Then listen and repeat. 103

achievement	encourage	engage in	require
-------------	-----------	-----------	---------

- _____ 1. help or support someone
- _____ 2. need something or make something necessary
- _____ 3. be involved in a cause
- _____ 4. success

6 YOU DECIDE Choose an activity.

- 1. **Work independently.** How well do you know your community? Investigate your area. Explore both online and ‘in the field’. Share your experience with the class.
- 2. **Work in pairs.** How might technology help in making new discoveries? Make a list of five ideas. Present your list to the class.
- 3. **Work in groups.** Investigate Corey’s work. Which of his inventions would you like to own? What would you do with it?

SPEAKING STRATEGY 104

Hesitating or buying time when answering questions

Where do you see yourself in five years?	Hmm, that’s tough. I’d like to be studying in South America, but I might need to get a job.
What made you want to learn Cantonese?	Well, it’s hard to explain. I guess I’ve just always wanted to travel to Guangzhou.
Why do you think humans explore?	That’s a good question. Let me think about that one for a minute.

1 Listen. How does the speaker buy time before responding to the question? Write the phrases you hear. 105

2 Read and complete the dialogue.

Caleb: So, Kenji, how do you like living in Canada?
Kenji: _____. I guess I’m enjoying my experience overall, but there have been some challenges.
Caleb: What’s been the biggest challenge?
Kenji: _____. Probably speaking English all the time and trying to make friends.
Caleb: But joining the baseball team has made you really popular. We’re number one in the league for the first time! How did you get so good at it?
Kenji: _____. In Japan, I’m just a normal player. We practise a lot. All year, in fact. Don’t you do the same with hockey?
Caleb: Some people do, but I just play for fun. Besides, I like playing baseball in spring.
Kenji: Would you like to visit Japan someday?
Caleb: _____ it’d be fun, but it sounds like I’d better get serious about baseball first!

3 Work in pairs. Cut out the cards on page 175. Take turns asking each other the questions on the cards. Use the phrases above to buy time when necessary.

4 Work in groups. Write five original questions to ask your group. Then take turns asking and answering your questions.

Hmm, that’s a good question. I’d really like to go to Borneo.



What is your favourite book?
Hmm, that’s a tough one. Let me think about that.

Go to page 175.

GRAMMAR 106

Narrative tenses: Telling a story

Barrington Irving **had been preparing** to become a pilot since he was 15.

He **found** a manufacturer to build an aeroplane from donated parts that he **had received**.

On the day of the flight, he **was** ready, but he **was feeling** a little nervous.

Finally, Barrington **set off** on his historic flight. He **flew** around the world in 97 days and set a world record.

1 Listen. Answer the questions below using the narrative tenses. 107

1. What career had Barrington been preparing for?

2. What happened when Barrington met a Jamaican pilot?

3. How did he start learning to fly?

4. What had he been offered? Did he accept the offer?

5. What was Barrington doing before his first solo flight?

6. How was his first solo flight?

2 Read. Underline the narrative tenses in the paragraph.

3 Write. Re-read the prompt from Activity 2. Write your own response using the narrative tenses. Then share your response in a group.

Prompt: Talk about a time when you achieved something important. What did you achieve? How had you been preparing?

Once I climbed a mountain that was over 3,000 m. (10,000 ft.) tall. I had been training with my dad all spring to get ready. We had been practising on smaller mountains. To climb the mountain, we were using special equipment like ice picks and thick ropes. After we had reached the top, it felt great to look down on the forest below us. I later climbed three other mountains with my dad, and we plan to do another next month.

4 LEARN NEW WORDS Listen to the story of Barrington's first solo flight around the world. 108
Then listen and repeat. 109



This map shows the **route** that Barrington flew. His plane was in **motion** for most of his 97-day trip around the **globe**.

Barrington **set a record** as a pilot. Now he works to **educate** students in maths and science.



5 Work in pairs. Read the interview questions and fill in the blanks with the correct words from the box. Then answer the questions as if you were Barrington. Use the narrative tenses.

globe motion pilot route set a record

1. Q: How had playing video games prepared you to become a _____?

A: _____

2. Q: How were you able to get an aeroplane to fly around the _____?

A: _____

3. Q: How many stops were on your _____?

A: _____

4. Q: What were you doing to stay awake while in _____ for so many hours?

A: _____

5. Q: How did you feel when you heard you had _____?

A: _____

6 Work independently. Investigate another person who has explored new places. Write a narrative about the explorer's route, experiences and accomplishments. Share what you learnt with the class.

THE Explorer GENE

Are we born to explore?

None are so driven to explore as humans. Animals will go in search of food or water, but humans can be motivated simply by the possibility of discovery. So what is it exactly that caused us to spread out across the globe 60,000 years ago, instead of just staying in Africa?

Perhaps it's in our DNA. In 1999, Dr Chuansheng Chen led a team of scientists who were studying a gene known as *DRD4-7R*. This gene is found in about 20 per cent of all humans. It's been associated with higher rates of risk-taking, exploration and interest in new ideas. Dr Chen found that *DRD4-7R* is more common in societies that move

around a lot than those who don't. For example, studies in Africa show that the gene is much more common in nomadic tribes than in tribes that prefer to stay in one place. Several other researchers have studied this topic and found additional evidence to support Dr Chen's claim.

Journalist and National Geographic Fellow Paul Salopek is walking from where humans began in Ethiopia, Africa, to the southern tip of South America, following our ancestors' ancient journey.

But can a single gene be responsible for a trait as complex as the desire to explore? Dr Kenneth Kidd doesn't think so. He thinks *DRD4-7R* might increase curiosity, but other equally important sets of genes give us intelligent minds and skilled hands. We then use our minds and hands to create things. He believes that not just one gene, but groups of genes work together to create complex behaviours like exploration.

The context we live in also plays a role in our desire to explore. For example, during the European Age of Exploration, explorers became rich and famous for their discoveries. This drove others to try to increase their wealth through exploration. In this case, their exploration was more likely motivated by money than by genes.

Maybe the desire to explore comes from something inside us, such as the *DRD4-7R* gene. Or maybe it has more to do with what's happening in the world around us. Maybe both. Whatever the reason, it seems we (or at least some of us) will keep exploring the mountains, the sea, the stars and beyond, because that's just what humans do.

1 BEFORE YOU READ Discuss in pairs. Based on the title and the photo, what do you think you'll learn in this reading? **21ST C**

2 LEARN NEW WORDS Find these words in the reading. What do you think they mean? Look at how they're pronounced in a dictionary. Say them aloud. Then listen and repeat. **110**

associated gene motivate trait

3 WHILE YOU READ Listen and read. Think about a person you know who might have the explorer gene. **111**

4 AFTER YOU READ Work in pairs to answer the questions.

1. What makes humans explore? How are we different from animals?
2. What traits is the *DRD4-7R* gene associated with?
3. What percentage of humans have this gene?
4. What is Dr Kenneth Kidd's opinion regarding *DRD4-7R*'s connection to exploration?
5. What else might cause humans to explore?

5 Work in pairs. Describe the person that you thought of in Activity 3. Give examples to explain why you think this person has the gene.

6 Discuss in groups.

1. Do you believe a gene causes humans to explore? Or do you think it has more to do with other factors? Explain.
2. Do you think you have the *DRD4-7R* gene? Explain, with examples. What other beliefs and behaviours might be caused by something in your genes?
3. Are humans exploring more now than in the past? Will we ever stop exploring? Explain.

1 BEFORE YOU WATCH Discuss in pairs. Why is it important to explore?

2 WHILE YOU WATCH Complete the quotes. Watch scene 8.1.

1. 'It's part of _____ to be _____ and to want to learn more about the world.'
2. 'It _____. I mean that's what exploring is about.'
3. 'We think we know _____, but we don't. We think we know _____, but we don't. We think we _____, but we don't.'
4. 'By knowing what's out there, we _____.'

3 AFTER YOU WATCH Read and circle the correct letter.

1. Which of the following reasons for exploring is not mentioned in the video?
 - a. Exploring helps us engage more fully with our world.
 - b. Exploring will make us famous.
 - c. Exploring is part of human nature.
2. Why is it important to care about what's out there?
 - a. So that we can stop asking questions
 - b. So that we can engage with our world and act with love
 - c. Because very few people do
3. What do we use to help us explore?
 - a. Information about the people who came before us
 - b. Information about new species of animals
 - c. The high-tech tools of science
4. Why is technology important for exploration?
 - a. Because without technology, it's impossible to discover any new animal species.
 - b. Because it lets us explore places that are otherwise inaccessible.
 - c. Because technology is so important for conservation.

4 Work in pairs. Review your answer for Activity 1. Compare it with what you heard in the video. Discuss your comparisons with your partner.

5 Work in groups. You're in charge of a school-wide campaign to promote exploration. Create a poster or an advertisement on the benefits of exploring. Present your work to the class.

6 YOU DECIDE Choose an activity.
21ST C

1. **Work independently.** Research one of the explorers from the video to learn more about his/her work. Share what you learnt with the class.
2. **Work in pairs.** Make your own video, similar to this one. Interview other students and ask them, 'What can we learn from exploring our region?'
3. **Work in groups.** Research a recent discovery of a new species. Find out who the explorers were, where they went and what led them to the discovery.

Explorers camping near the Nyiragongo volcano, Democratic Republic of the Congo

GRAMMAR 112

Geographic use of *the*

I'm going to **the Himalayas** to climb **Mount Everest**.
The Yangtze is the longest river in **Asia**. **Lake Baikal** is the largest lake in **Asia**.
The equator passes through **Isabella Island**, the largest of **the Galápagos Islands**.
Explorer Ferdinand Magellan was born in **Portugal**, but died in **the Philippines**.
Ibn Battuta left his home in **Morocco** to travel to other countries in **Africa** and **the Middle East**.

1 Read. Fill in the timeline of female explorers by adding *the* when necessary.

1805

Native American Sacagawea guided Lewis and Clark through _____ Oregon Territory of _____ United States.



1908

Mountaineer Annie Smith Peck was the first person to climb _____ Huascarán, a 6,768 m. (22,204 ft.) mountain in _____ Peru.



1953

Eugenie Clark wrote a book about studying sharks in _____ Sea of Cortez, near _____ Mexico.



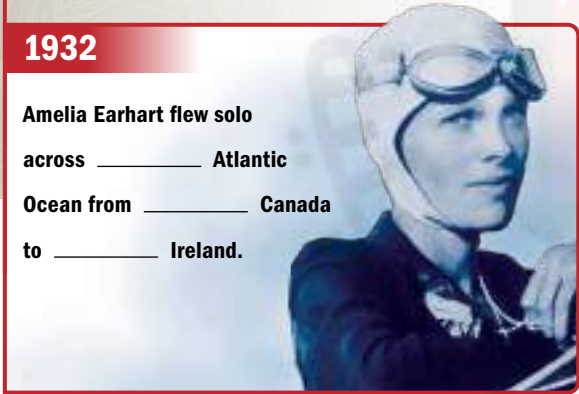
1894

Mary Kingsley travelled to _____ Sierra Leone, then to _____ Gabon and up _____ Ogowe River by canoe, encountering hippos, crocodiles and gorillas.



1932

Amelia Earhart flew solo across _____ Atlantic Ocean from _____ Canada to _____ Ireland.



2 Work in pairs. Cut out the cards and place them face down. Take turns trying to match the information with the explorer. When you make a match, describe the explorer's work, using the places on the card.



Go to page 177.

WRITING

When writing a news report, we should consider the five *Ws*: *who*, *what*, *where*, *when* and *why*, as well as *how*. Answering some of these questions early on can capture the reader's interest and make him/her want to know more. Answering these questions will also provide necessary details about the situation in the report.

1 Read the model. Work in pairs. Identify the five *Ws* and *how* in the news report.

On Top of the World!

Shaikh Mohammed Bin Hamad Al Khalifa successfully climbed Mount Everest in May 2021. His team included members of the Bahrain Royal Guard, and they are the first Bahraini nationals to climb Mount Everest. They were also the first international team to conquer the new altitude (8,848.86 m.) of the world's tallest mountain.

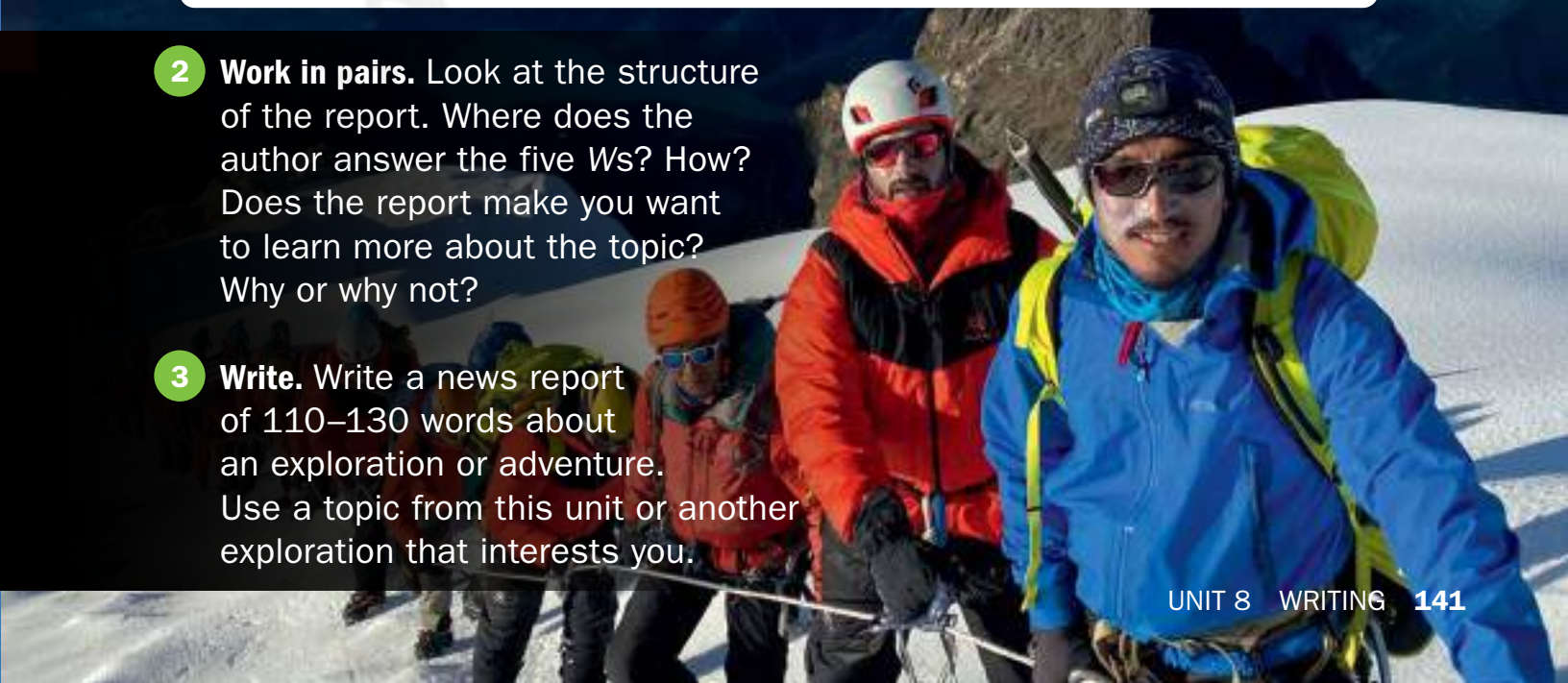


Climbing Everest is an ambition for many experienced climbers because it's the highest peak in the world, but it requires a lot of experience and skill to get to the top safely. The climate of Everest is one of the most difficult things for climbers to manage. The warmest daytime temperature is only about -19 °C (-2 °F) on the summit. During the coldest month of the year, the average temperature at the summit is around -36 °C (-33 °F), but it can drop as low as -60 °C (-76 °F). The weather on Everest can also change very suddenly, which makes it a dangerous environment for climbers.

The Bahraini team trained in the Himalayas in Nepal for a couple of months before embarking on their expedition to conquer Everest. They climbed several smaller mountains as part of their preparation. On the day they reached the summit of Everest, the team held the Bahraini flag at the top to mark their achievement.

2 Work in pairs. Look at the structure of the report. Where does the author answer the five *Ws*? How? Does the report make you want to learn more about the topic? Why or why not?

3 Write. Write a news report of 110-130 words about an exploration or adventure. Use a topic from this unit or another exploration that interests you.





Learn by Doing

‘If you have curiosity, you have to be an explorer. You have to go out and find the answers yourself without waiting to get them from others.’

Corey Jaskolski

National Geographic Explorer, Engineer/Inventor

1. **Watch scene 8.2.**
2. How do you learn best – by listening to your teacher or by doing something for yourself? What are the advantages of each type of learning? Talk about a time when you learnt something new just by doing it.
3. When you go to a new place, what tools do you use to help you explore? What other tools could you use to learn about another place? Name two or three that you would like to have.

PROJECT

Make an Impact

YOU DECIDE Choose a project.

1 Plan an expedition.

- Research where you will explore and what you hope to find.
- Plan your expedition. Create an itinerary with photos and a map showing where you plan to explore. Add as much detail as possible.
- Present your plan to the class.

2 Profile a well-known explorer.

- Research an explorer from the past or present.
- Prepare a biography of the explorer. Include information on where he/she has explored, what he/she has discovered, and his/her methods and tools.
- Create a poster or a computer-based presentation to share what you learnt.

3 Explore from home.

- Research different ways to explore without leaving your home.
- Identify advantages and disadvantages of virtual exploration.
- Write a feature article to describe ways for people to explore virtually. Use examples from your own experience.



Express Yourself

1 Read and listen to the tour description.  113

A TOUR OF

Thun, Switzerland

Welcome to Thun, Switzerland — a beautiful town by the River Aare, at the west end of Lake Thun.

Join us on a three-hour tour of the town and discover some of Thun's amazing buildings and sights.

We begin our tour at the bus station. Next, we cross a bridge over the River Aare to the island of Bälliz. This is Thun's shopping area. There are a lot of expensive clothing stores here, but you can also buy fruit, vegetables and flowers on Wednesdays and Saturdays at the market.

Next, we cross another bridge to visit Castle Thun in the old town. The castle is more than 800 years old. It is now a museum and concert hall. After we visit the castle, it's time for lunch! If the weather is sunny, we can eat at one of the outdoor cafés by the river.

After lunch, we walk to Schadau Park, a beautiful garden on the shore of Lake Thun. Here, we can also see the famous Thun-Panorama. A Swiss artist painted this 360-degree image of the town in 1814.

Finally, we return to the old town and visit one of the many cafés for some coffee and a piece of delicious cake.

2 **Work in groups.** Discuss the tour description.

1. What do you find interesting about this tour?
2. Would you like to go on a tour like this? Why or why not?
3. What do you think you can learn about a town when you walk around it?

3 **Connect ideas.** In Unit 7, you learnt about visual stories. In Unit 8, you learnt about exploration. What connection can you see between the two units?

4 **YOU DECIDE** Choose an activity.

21ST C

1. Choose a topic:
 - lakes and rivers
 - historical buildings
2. Choose a way to express yourself:
 - a description of a tour
 - a travel review of a place you have visited
 - a postcard
3. Present your work.

Thun, Switzerland

Unit 1

Intonation in question tags

- 1 Listen. Notice how the voice goes up or down in the question tag. 114

He seems shy, doesn't he?

The voice goes down in the tag. In this case, the speaker is sure or almost sure.

You're not jealous, are you?

The voice goes up in the tag. In this case, the speaker is less sure.

Unit 2

Relaxed pronunciation: Modals + have + past participle

- 1 Listen. Notice how *have* is pronounced after modals. 117

They could have read about it.
He might have seen a jellyfish.
She must have been scared.

Have is often reduced. It sounds like the word *of*.

- 2 Listen and repeat. Does the voice go up or down? Mark it with an arrow. Then circle the tags where the speaker is sure. 115

1. Your friends aren't very open-minded, are they?
2. Your sisters are very competitive, aren't they?
3. You didn't go to the party on Saturday, did you?
4. Your sister was at the party, wasn't she?
5. You were very anxious about the exam, weren't you?
6. You've become more self-confident, haven't you?

- 3 Work in pairs. Listen and repeat each sentence. Then take turns repeating the question tags and answering them. 116

You love school, don't you? Yes, I do!

1. You love school, don't you? (sure)
2. English is easy, isn't it? (sure)
3. Your town has got a football team, hasn't it? (not sure)
4. Your family is big, isn't it? (not sure)
5. You haven't got a pet, have you? (sure)

- 2 Listen and repeat. Make sure you reduce *have*. 118

1. She might have seen a spider.
2. They must have been afraid.
3. He could have read about the bear.
4. They could have been fire ants.
5. It might have been a rat.

- 3 Work in pairs. Take turns responding to the statements. Use *could* / *might* / *must* + *have* and the phrase in brackets. Reduce *have*.

Gina just screamed. She must have seen a cockroach.

1. A: Gina just screamed. (B: seen a cockroach)
2. A: Lee and Sue are afraid. (B: heard about the snakes)
3. A: Ray doesn't want to swim. (B: known about the sharks)
4. A: I was stung by a wasp! (B: been near its nest)
5. A: Julian went home. (B: felt sick)
6. A: Ann likes parrots. (B: read about them)

Unit 3

Pausing

- 1 Listen. Notice the short pauses between the groups of words that go together. 119

She's scared of wasps, / so we stayed in.

As a result, / we didn't go hiking.

In writing, pauses are often signalled by punctuation such as commas or full stops. But this is not always the case. Listen to this example. Notice the pause.

We stayed in / because he was scared.

Pausing will help your speech to be clear and easy to understand.

Unit 4

Shouldn't have + past participle

- 1 Listen. Notice how *not have* is pronounced after *should*. 121

You shouldn't have thrown it away.
I shouldn't have washed it.

Not have or the contracted *n't* is often reduced to sound like *unt*. *Have* sounds like the word *of*. There is just a small difference between the negative and positive forms. Listen closely.

He should have bought it.
He shouldn't have bought it.

- 2 Listen and repeat. Draw a line where you hear a pause. 120

1. In my class, we often work in groups.
2. Students work hard, so they should get a break.
3. When I see a spider, I scream.
4. I don't like ants because they seem dirty.
5. I like elephants because they have complex emotions.

- 3 Work in pairs. Take turns completing the sentences using your own ideas. Add pauses when you speak. Your partner will respond. When you finish, swap roles.

In my class, I ask a lot of questions. Me, too!

1. In my class, _____.
2. Students work hard, so they _____.
3. When I see a spider, _____.

- 2 Listen. Circle the form you hear. Then listen again and repeat. 122

1. A: Oh, I (should / shouldn't) have bought this shirt.
B: You (should / shouldn't) have cut the tags off.
Now you can't return it!
2. A: You (should / shouldn't) have gone to that shop.
You (should / shouldn't) have tried the new one I told you about.
B: Oh, I forgot! You (should / shouldn't) have reminded me.

- 3 Work in pairs. Take turns practising the conversations with your partner. Use *shouldn't have* and the words in brackets.

1. A: I'm so tired today! (B: gone to bed so late)
2. A: I ruined my jeans! (B: washed them in hot water)
3. A: I failed the test! (B: missed so many lessons)
4. A: He made me late! (B: waited for him)

I'm so tired today! You shouldn't have gone to bed so late.

Unit 5
Past perfect

1 Listen. Notice how had sounds in the past perfect.

A: Had anyone tried to fly before the Wright brothers?
B: Yes, I think flying had been attempted by Abbas Ibn Firnas.

A: Until the lesson, Tim had never realised that bats are mammals.
B: I hadn't either!

When had comes after the subject or a question word, the pronunciation is often contracted 'd or reduced.

The word had is not reduced when it comes at the beginning of a question, in a negative statement or in a short answer. The vowel sound is clearly pronounced.

Unit 6
Final d + you

1 Listen. Notice how the final d links with the y in you.

Would you go to Mars?
Could you help me with my essay?
Did you know that Mars had water?
Who told you about Space Camp?

When the final d links with the y, it forms a j sound (as in juice).

2 Listen and repeat. Circle the two reduced examples of had.

- 1. A: Who had never seen a bat up close? B: I hadn't. They're so small!
2. Cindy had always wanted to learn about birds.
3. A: Had you seen a bat before, Matt? B: Yes, I had. But I hadn't realised they were mammals.

3 Work in pairs. Listen and complete the conversation with had or hadn't. Circle each reduced had. Then practise the conversation.

A. Some ancient bird fossils are missing. The guard had just finished his breakfast when he heard something downstairs. But all he found was the case open and the fossils missing.
B: anyone signed in?
A: No, no one signed in, but someone been in there.
B: OK, talk to anyone who might've seen something.
A: Yes. We will. One student been studying near the door at the time, but says he been paying attention.

2 Listen and repeat. Draw an arrow to link the final d words to you.

- 1. Where did you go on your last holiday?
2. If you could, would you go to the moon?
3. Who called you or texted you last week?
4. Did you get a good mark on your last test?
5. What did you do last weekend?

3 Work in pairs. Take turns asking and answering the questions in Activity 2. Make sure you link the d and y sounds.

Where did you go on your last holiday?
I went to the mountains with my family.
What did you do there?
We went skiing.

Unit 7
Final /ə/ sound

1 Listen. Listen for the final ə sounds. Can you hear them?

Ami Vitale is a photographer.
The painter asked if he could paint her portrait.
She told him she wanted to be an inventor.

Many professions end with the ə sound. Sometimes this is spelt -er, and sometimes it's spelt -or.

Unit 8
Sounds of letter x

1 Listen. Notice the pronunciation of the letter x.

Table with 2 columns: ks, gz. Rows: explore, Mexico, exact, exist.

The letter x can be pronounced two ways - ks or gz. The pronunciation is usually ks. However, when the x comes before a vowel and the syllable after x is stressed, the x sounds like gz.

Note: There are a few words that begin with x (xylophone). In this case, the x sounds like z.

2 Work in pairs. Listen to the names of the professions. Decide if they end in -er or -or.

- 1. philosoph
2. art direct
3. web develop
4. doct
5. carpent

3 Write the names of the professions. Then listen and check.

- 1. Someone who works in a school is a
2. The famous played the part of Hamlet.
3. Corey Jaskolski is an and engineer.
4. Someone who studies the stars is an

2 Listen and repeat. Then write ks or gz to indicate the sound of x.

- 1. ks explore
2. expert
3. executive
4. exercise
5. exam
6. complex
7. exist
8. exactly

3 Work in pairs. Complete the paragraph with the words. Then listen and check your answers. Take turns reading the paragraph with your partner.

Table with 5 columns: exactly, exciting, existence, expedition, experience, expert, explore, Mexican, Mexico, taxes.

Come and explore ! Our is led by an in history. In your fascinating ten-day , you will learn about the of prehistoric civilizations.
The cost of this trip is €3,000. No or added fees. Book today!

Irregular Verbs

Infinitive	Past simple	Past participle	Infinitive	Past simple	Past participle
be	were	been	leave	left	left
beat	beat	beaten	lend	lent	lent
become	became	become	let	let	let
begin	began	begun	lie (down)	lay	lain
bend	bent	bent	light	lit	lit
bet	bet	bet	lose	lost	lost
bite	bit	bitten	make	made	made
bleed	bled	bled	mean	meant	meant
blow	blew	blown	meet	met	met
break	broke	broken	overcome	overcame	overcome
bring	brought	brought	pay	paid	paid
build	built	built	put	put	put
burn	burnt	burnt	quit	quit	quit
buy	bought	bought	read	read	read
carry	carried	carried	ride	rode	ridden
catch	caught	caught	ring	rang	rung
choose	chose	chosen	rise	rose	risen
come	came	come	run	ran	run
cost	cost	cost	say	said	said
cut	cut	cut	see	saw	seen
deal	dealt	dealt	sell	sold	sold
dig	dug	dug	send	sent	sent
dive	dived	dived	set	set	set
do	did	done	sew	sewed	sewn
draw	drew	drawn	shake	shook	shaken
dream	dreamt	dreamt	shine	shone	shone
drink	drank	drunk	show	showed	shown
drive	drove	driven	shrink	shrank	shrunk
dry	dried	dried	shut	shut	shut
eat	ate	eaten	sing	sang	sung
fall	fell	fallen	sink	sank	sunk
feed	fed	fed	sit	sat	sat
feel	felt	felt	sleep	slept	slept
fight	fought	fought	slide	slid	slid
find	found	found	speak	spoke	spoken
flee	fled	fled	spend	spent	spent
fly	flew	flown	spin	spun	spun
forbid	forbade	forbidden	stand	stood	stood
forget	forgot	forgotten	steal	stole	stolen
forgive	forgave	forgiven	stick	stuck	stuck
freeze	froze	frozen	sting	stung	stung
fry	fried	fried	stink	stank	stunk
get	got	got	strike	struck	struck
give	gave	given	swear	swore	sworn
go	went	gone	sweep	swept	swept
grind	ground	ground	swim	swam	swum
grow	grew	grown	swing	swung	swung
hang	hung	hung	take	took	taken
have	had	had	teach	taught	taught
hear	heard	heard	tear	tore	torn
hide	hid	hidden	tell	told	told
hit	hit	hit	think	thought	thought
hold	held	held	throw	threw	thrown
hurt	hurt	hurt	understand	understood	understood
keep	kept	kept	wake	woke	woken
kneel	knelt	knelt	wear	wore	worn
knit	knitted	knitted	weave	wove	woven
know	knew	known	win	won	won
lay	laid	laid	write	wrote	written
lead	led	led			

Two-word phrasal verbs – Inseparable

Verb	Meaning	Sample sentence
amount to	be the same as; turn out to be	The total amounts to five hundred. Some people thought he would not amount to anything, but he became famous.
apply for	to make a request	Do you plan to apply for a summer job?
apply to	be relevant	The rules apply to everyone!
ask around	ask several people	I'll ask around in case anyone found a lost phone.
break down	stop functioning	The car broke down yesterday.
calm down	relax after being angry	Calm down! Everything will be OK.
check in	register at a hotel or airport	We can't check in until one o'clock.
check out	leave a hotel	He checked out at 10.20 and went straight to the airport.
cheer up	become happier	Cheer up! I'm sure your team will do better next time.
come across	find unexpectedly	I came across a very interesting article about crocodiles.
come from	originate in	Mangoes originally come from Asia.
count on	rely on	Please be there on time. I'm counting on you!
dress up	wear nice clothes	Mum, do I really need to dress up for the party?
eat out	eat at a restaurant	Why don't we eat out on Friday?
end up	eventually do/decide	We ended up going to the cinema last night.
engage in	take part in	The head teacher engaged in talks with the student council.
fall apart	break into pieces	Mum, I need a new desk. This one's falling apart .
fall down	fall to the ground	The vase fell down and smashed.
find out	learn	I was so excited when I found out we were going to Spain!
fit in	blend in; belong because you're similar	Teenagers wear certain clothes to fit in .
get along	be friendly with someone	I really like Tom. We get along well.
get over	recover from a problem	I know she's upset you didn't call her, but she'll get over it.
get together	meet; gather	Let's get together on Wednesday after school!
get up	get out of bed; rise	I get up at seven o'clock every day.
give in	surrender; quit	I won't give in to pressure from my friends.
give up	stop trying	This puzzle is really hard, but we won't give up !
go ahead	do; begin to do	Why don't you go ahead and invite her to the party?
go back	return	He went back to the site and discovered a second dinosaur.
go over	review	Let's go over the presentation before the lesson.
grow up	become an adult	I grew up in China.
hang in	stay positive	Hang in there. I'm sure you'll find the phone.
hang on	wait	Hang on a minute. I'm on the phone.
hang out	spend time	Do you want to hang out on Saturday?
hold on	wait	Hold on a second! I think I found the answer.
lead to	cause to happen	His research led to the discovery of a new species.

Verb	Meaning	Sample sentence
light up	become bright	The sky lit up with fireworks.
log in/on	sign in to a website or app	I can't log in because I can't remember my password.
look after	take care of	I have to look after my little sister on Sunday.
look back	think about things that happened in the past	Looking back , I think the other project topic was more interesting.
look for	try to find	What are you looking for ? Did you lose something?
look into	try to find out about	I need to look into it. I'll let you know tomorrow.
not care for	not like	I don't really care for opera.
pass away	die	I heard Kim's grandma passed away .
prey on	hunt and kill for food	Do lions prey on zebras?
rave about	talk or write very enthusiastically	Critics are raving about the new film.
rely on	trust; depend on	Do you think we rely on technology too much?
run away	escape; leave	Our cat ran away !
run into	meet unexpectedly; collide	Yesterday I ran into my old teacher. I ran into a tree.
stand out	be noticeable	I was the only one wearing purple. I really stood out .
take off	start to fly	The flight took off on time.
turn out	result; happen	I thought everyone in my family had a mobile phone. It turns out my uncle refuses to get one!
wake up	stop sleeping	I usually wake up at six o'clock.
warm up	prepare for exercise	Do you warm up before football games?
work out	be successful; exercise	Everyone liked our presentation. It worked out well! I prefer to work out in the gym when it's cold.

Two-word phrasal verbs – Separable

Verb	Meaning	Sample sentence
back up	support	His friends backed him up .
call off	cancel	They had planned a party, but they had to call it off .
calm down	help relax	Let's play soft music to calm the baby down .
carry out	do or complete something	They are carrying out research on ancient birds.
check out	observe; notice	Check out my new phone!
cheer up	try to make someone happy	Why don't we get some flowers to cheer her up ?
clean up	organise; clean	Can you clean that up ? Guests are arriving soon.
cut down	make something fall to the ground	They're cutting down too many trees.
cut off	remove by cutting	Did you read about that hiker that had to cut off his own arm?
draw in	capture the interest	This book really drew me in .
equip with	supply with	They equipped the astronauts with extra oxygen tanks.
fill out/in	write information in a form	Remember to fill out the form before the end of the week. Fill in your details on page 6.

Verb	Meaning	Sample sentence
fill up	fill to the top	Don't fill up the cup. I need room for milk.
find out	discover information	How did you find that out ?
get across	make understandable	We need to add more examples to get the idea across !
give back	return something	Have you still got my book? Can you give it back to me?
give up	stop (a habit)	I'm giving up coffee!
hand in	submit	Did you hand in your homework on time?
hand out	distribute	I'll make copies and hand them out .
let down	disappoint	I really want you to come to the party. Don't let me down .
let in	allow to come in	They didn't let him in with his rucksack.
light up	make bright	At night the stars light the sky up .
look up	find information	Can you look it up in a dictionary?
make up	lie about; invent	That can't be true. I think he made it up .
mix up	confuse things or people	They always mix me up with my sister.
put off	postpone	Can we put off the meeting until next week?
put together	assemble	Can you help me put this together ?
take down	remove	They took down the painting because it was controversial.
take off	remove	Take off that coat. You'll be too hot.
take over	gain control of	He took over the company when his father died.
throw away	put in the rubbish; get rid of	Don't throw away plastic bottles. Recycle them.
track down	find after a long search	I'm trying to track down a friend from my childhood.
try on	put on to see if it fits	I tried on my sister's shoes, but they didn't fit.
turn away	reject; refuse to admit	Hundreds of people were turned away from the audition.
turn down	decrease the strength	Turn the TV down a bit. It's too loud.
turn off	power off	Don't forget to turn off the lights when you leave.
turn on	power on	Turn on the TV. The match has started!
turn up	increase the strength	I can't hear. Can you turn up the volume?
warm up	make warmer	Can you warm up the milk?
work out	find a solution	I'm sure you'll work it out .

Three-word phrasal verbs – Inseparable

Verb	Meaning	Sample sentence
add up to	become a certain amount; result in something	The total adds up to two hundred.
come down with	become ill	He came down with a cold.
come up against	face; confront	He came up against many obstacles during his research.
come up with	think of; find a solution	She came up with an excellent plan.
cut down on	use less of; do less	You should cut down on your screen time!
get along with	be friendly with	My sister gets along with everyone!
get round to	find time to finally do	I finally got round to writing my blog.
get away with	not get caught	How did you get away with not doing your homework?
get back into	become interested again	I stopped playing football two years ago, but then I got back into it.

Verb	Meaning	Sample sentence
get out of	avoid doing something you don't want to do	I think that's just an excuse to get out of doing the project!
give up on	lose hope that somebody or something will succeed	I gave up on trying to become an athlete.
grow out of	change your mind over time; become too big for	He wants to be a singer, but I'm sure he'll grow out of it. You'll grow out of that jacket before winter is over!
look down on	feel that somebody is less important	Many people looked down on him and his art, but he went on to become a famous artist.
look forward to	be excited about (something in the future)	I look forward to going on holiday.
look out for	protect; take care of	He's very selfish! He only looks out for himself.
look up to	have a lot of respect for	Many youngsters look up to athletes or musicians.
play around with	try several options	I played around with it until I found the problem!
put up with	tolerate	Our teacher doesn't put up with bad behaviour.
run out of	use everything	I think we've run out of milk. Can you get some?
stand up for	defend	Don't let him make fun of you. Stand up for yourself!
watch out for	be alert; anticipate	Watch out for deer crossing the road!

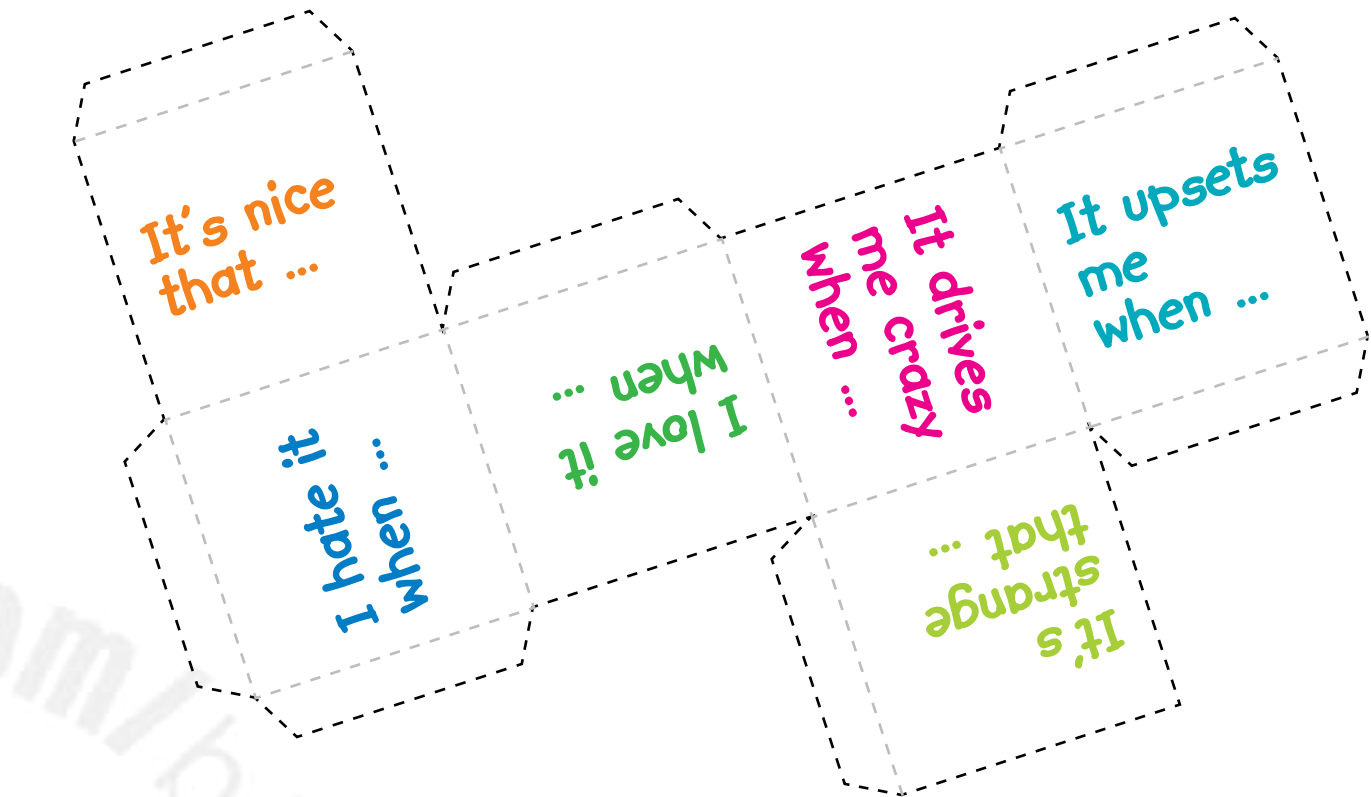
Verbs followed by infinitives and gerunds

Verbs followed by infinitive			Verbs followed by infinitive or noun/pronoun + infinitive		Verbs followed by noun/pronoun + infinitive	
He agreed to go .			He wants to learn French. I want him to learn French.		I convinced her to try sushi.	
afford	deserve	offer	ask	prepare	cause	motivate
agree	fail	plan	choose	promise	challenge	order
appear	happen	pretend	dare	want	convince	persuade
arrange	hesitate	refuse	expect	wish	empower	remind
attempt	hope	seem	need	would like	forbid	tell
care	intend	tend			force	urge
claim	learn	vow			hire	warn
decide	manage	wait			invite	
demand						

Verbs followed by gerund or noun/pronoun + infinitive	Verbs followed by a gerund				
They don't allow surfing here. They didn't allow him to surf here.	You should avoid swimming there.				
advise	admit	delay	imagine	mind	report
allow	anticipate	deny	involve	miss	resist
encourage	appreciate	discuss	justify	postpone	risk
permit	avoid	dislike	keep	practise	suggest
require	can't help	enjoy	look forward to	put off	understand
	carry on	feel like	mention	recommend	
	consider	finish			

Verbs followed by infinitive or gerund (similar meaning)			Verbs followed by infinitive or gerund (different meaning)	
I hate waking up early. I hate to wake up early.			I remember going there last year. I remembered to go to the shop.	
begin	hate	prefer	forget	remember
can't bear	like	propose	go on	stop
can't stand	love	start	quit	try
continue			regret	





Giraffes clean their ears with their tongues. true	Kangaroos can't walk backwards. true	Polar bears cover their black noses with a paw when they want to hide in the snow. false
Sharks grow around 30,000 teeth in their lifetime. true	A bird called the Egyptian plover goes inside a crocodile's mouth to clean its teeth and then flies out safely. true	Some octopuses can be poisonous. true
Camels don't sweat, so their humps are full of water. false	Crocodiles can't stick out their tongues. true	The mantis shrimp has a special front arm that can heat surrounding water up to 4,700 °C (8,500 °F). true
Snakes use their tongues to help them smell. true	Hippos sweat a red-pink version of blood. false	The giant Goliath bird-eater spider can cover the head of a man. true

Start	Move forward 3 spaces.	Move back 1 space.	End
Make a sentence about army ants. Use: Because of		Make a sentence about schools of fish and predators. Use: As a result	Make a sentence about cockroaches. Use: So
Make a sentence about elephant group behaviour. Use: Since	Make a sentence about yourself and a friend. Use: So	Oh no! Move back 1 space.	Make a sentence about yourself and a family member. Use: Since
Oh no! Move back 1 space.	Make a sentence about bees and wasps. Use: Consequently	Make a sentence about yourself. Use: Because	Make a sentence about monkeys. Use: Because of
Make a sentence about yourself. Use: As a result	Make a sentence about groups of birds flying together. Use: Due to	Make a sentence about mosquitoes. Use: Due to	Oh no! Move back 1 space.



Insects evolved from ancient animals that lived in water. 	Bats evolved from large dinosaurs that lived on the ground.	Birth order is the best way to understand your personality.
Argue YES or NO.	Argue YES or NO.	Argue YES or NO.
Pterosaurs were too big to generate powered flight, so they just glided.	Over millions of years in the future, flight may eventually evolve in humans.	Feathers appeared before flight and helped control body temperature. 
Argue YES or NO.	Argue YES or NO.	Argue YES or NO.
Contagious behaviour such as yawning can sometimes cross species. 	Flight evolved because it helped creatures find new sources of food and escape predators.	Cockroaches are as careful about being clean as cats are.
Argue YES or NO.	Argue YES or NO.	Argue YES or NO.
Hollow bones in pterosaurs and birds reduced weight and supported wings in flight.	All birds that fly have got wings, but not all birds that have got wings fly. 	Cotton plants need only small amounts of pesticides, water and energy to produce crops used in clothing.
Argue YES or NO.	Argue YES or NO.	Argue YES or NO.

Before the Wright brothers developed a working engine, how long _____ they _____ ?

Before you started this class, how long _____ you _____ ?

Before your favourite author became famous, how long _____ he/she _____ ?

Before modern aeroplanes appeared, how long _____ inventors _____ ?

Before you became part of (group/team), how long _____ you _____ ?

Before pterosaurs developed flight, how long _____ insects _____ ?

fast

responsibly

long

energetically

carefully

+

+

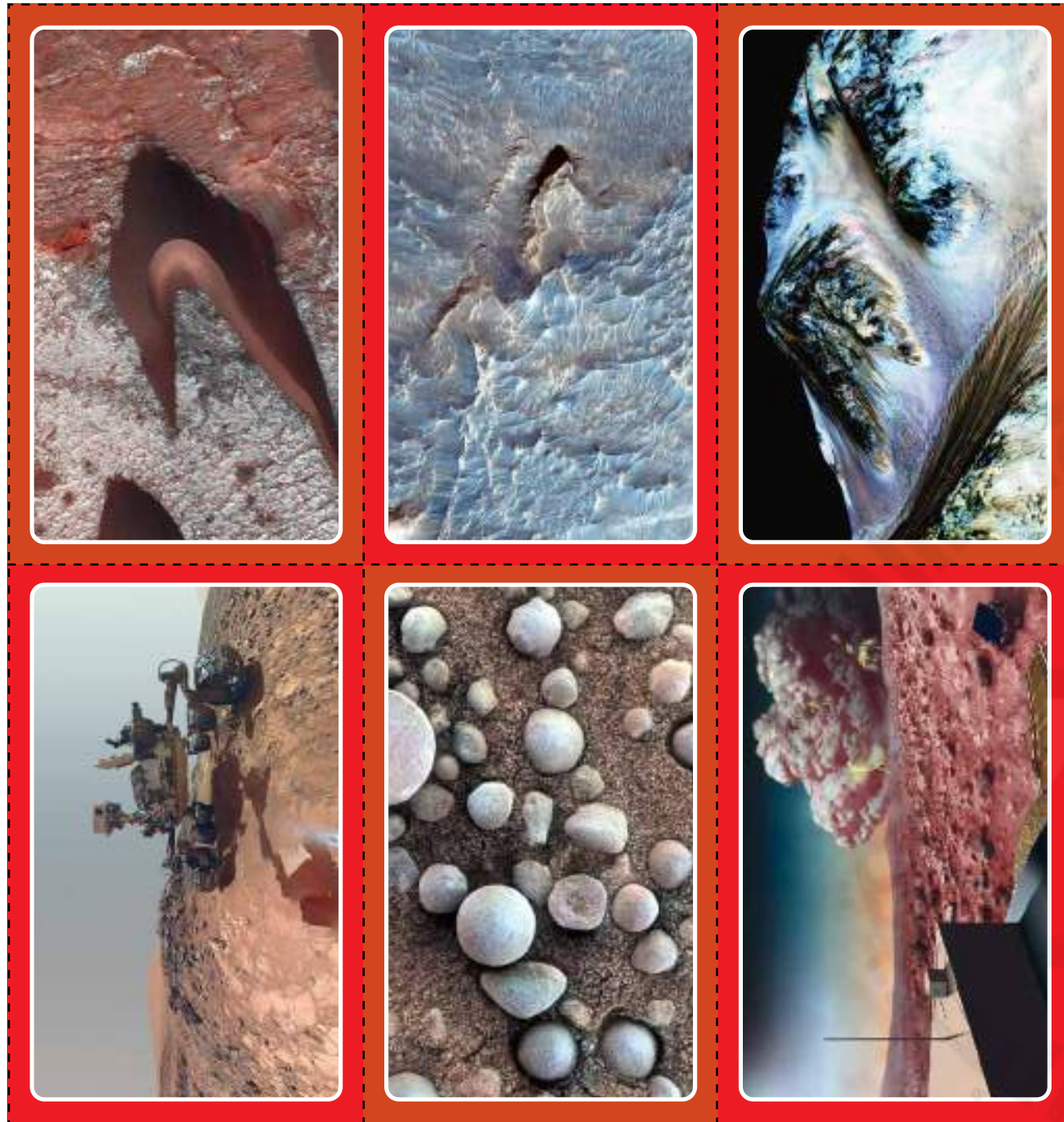
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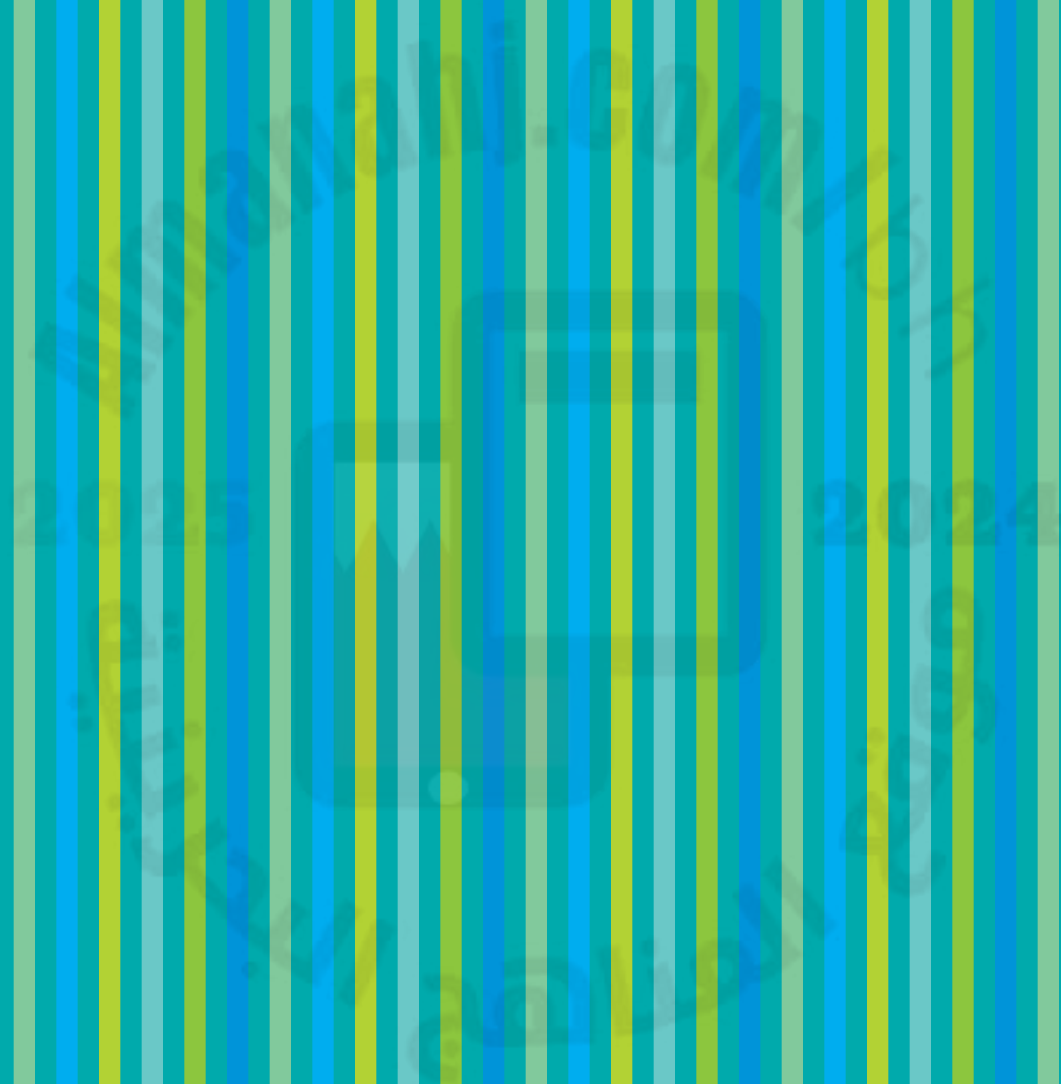




‘Can you tell a visual story?’		
‘Ami Vitale tells stories with her photos.’		
‘Use quality pencils and pens for drawing.’ 		
‘Stop reading so many comic books.’ 	‘I prefer realistic art to abstract art.’	
‘Videos are one way to tell a story.’		
‘I will learn to create animations.’	‘Do you like comic strips?’	
	‘Illustrators change their work many times before publishing it.’	

If you could go anywhere in the world, where would you go?	Identify an explorer of the past. Where did he/she go? What did he/she discover?	If you hosted a student from another country, what would you show him/her?
Would you want to travel to an extreme place, such as the ocean floor? Why or why not?	What can we learn about ourselves when we go to new places?	What obstacles must people overcome to explore new places?
Why do humans explore?	Do you have an explorer in your family? Who is it? Where has this person been?	What was the most exciting place you've ever explored? Why?
Which explorer that you've learnt about interests you the most? Why?	Would you want to live and study in another country for a year? Why or why not?	Would you consider yourself an explorer? Why or why not?

Mary Kingsley	Corey Jaskolski	study sharks South Pacific Ocean Sea of Cortez Mexico	discover fossils South Africa Johannesburg Southern Hemisphere
Amelia Earhart	Sylvia Earle	climb Huascarán Andes Peru	fly solo Jamaica Miami United States
Annie Smith Peck	Barrington Irving	fly solo Atlantic Ocean Canada Ireland	lead team of aquanauts Atlantic Ocean Bahamas
Eugenie Clark	Lee Berger	travel Africa Sierra Leone Gabon Ogowe River	film King Tut's tomb Egypt Middle East



1 Who am I?

Page 12

identity (n) /aɪ'dentɪti/

Your **identity** is all the things that make you different from other people.

- Your friends, family and beliefs all make up your **identity**.

personality (n) /ˌpɜː(r)sə'næləti/

The qualities that influence your behaviour make up your **personality**.

- Your **personality** has positive and negative qualities.

enthusiastic (adj) /ɪnθjuːzi'æstɪk/

If you are **enthusiastic** about something, you want to do it or get involved in it.

- **Enthusiastic** people are excited to do something.

outgoing (adj) /ˌaʊt'ɡəʊɪŋ/

Someone who is **outgoing** enjoys being with others and is always happy to meet new people.

- **Outgoing** people are very friendly.

self-confident (adj) /self 'kɒnfɪd(ə)nt/

If you are **self-confident**, you believe in your own abilities.

- **Self-confident** people are sure of themselves.

organised (adj) /'ɔː(r)ɡənəɪzd/

If you are **organised**, you keep your plans, things and ideas in order.

- **Organised** people plan carefully.

responsible (adj) /rɪ'spɒnsəb(ə)l/

If someone is **responsible**, you can depend on them.

- **Responsible** people do their duty.

energetic (adj) /ˌenə(r)'dʒetɪk/

Someone who is **energetic** is very active and does not get tired easily.

- I wish I were as **energetic** as you are in the morning!

optimistic (adj) /ˌɒptɪ'mɪstɪk/

Someone who is **optimistic** expects that good things are going to happen.

- **Optimistic** people hope that everything will be a success.

generous (adj) /'dʒenərəs/

Someone who is **generous** is always happy to share their things or their time.

- **Generous** people share with others.

patient (adj) /'peɪʃ(ə)nt/

Someone who is **patient** does not get upset when things go wrong or take a long time.

- **Patient** people stay calm when something takes a long time.

Page 13

sense of humour (n) /sens əv 'hjuːmə(r)/

Someone with a **sense of humour** is able to see the funny side of a situation.

- People with a **sense of humour** can make others laugh.

ambitious (adj) /æm'bɪʃəs/

Someone who is **ambitious** works hard to reach a goal.

- **Ambitious** people set high goals for themselves.

determined (adj) /dɪ'tɜː(r)mɪnd/

If you are **determined**, you don't let anyone or anything stop you from reaching your goals.

- **Determined** people don't give up once they decide to do something.

shy (adj) /ʃaɪ/

Someone who is **shy** finds it difficult to meet new people or talk in groups.

- **Shy** people feel uncomfortable around people they don't know well.

Page 14

anxious (adj) /'æŋkʃəs/

If someone is **anxious**, they feel worried or nervous.

- I was feeling **anxious** about the exam.

fair (adj) /feə(r)/

Fair people treat everyone equally.

- I didn't think that my brother was being very **fair** when he wouldn't let me have a turn.

odd (adj) /ɒd/

Something that is **odd** is unexpected, surprising or different from other things.

- **Odd** things may seem weird or strange.

stubborn (adj) /'stʌbə(r)n/

Someone who is **stubborn** will not give up thinking or believing something, even if it's wrong.

- **Stubborn** people don't change their minds very often.

Page 17

competitive (adj) /kəm'petətɪv/

If you are **competitive**, you always try hard to win.

- The teens in the contest were very **competitive**.

co-operative (adj) /kəʊ'ɒp(ə)rətɪv/

Co-operative people work together to reach a goal.

- Everyone on the team was very **co-operative** and worked well together.

jealous (adj) /'dʒeləs/

People feel **jealous** when someone else has what they want.

- I was so **jealous** that she won the prize! I wanted to win it.

helpful (adj) /'helpf(ə)l/
Helpful people do things for other people.
• *My parents have been very **helpful** as I get used to my new school.*

open-minded (adj) /,əʊpən 'maɪndɪd/
Someone who is **open-minded** respects different people and different points of view.
• ***Open-minded** people are willing to listen to others' ideas.*

Page 18

bossy (adj) /'bɒsi/
Bossy people like to tell other people what to do.
• *Although he was being very **bossy**, he did get everyone to finish their work.*

ignore (v) /ɪg'noʊ:(r)/
When people **ignore** someone or something, they don't pay attention to that person or thing.
• *Several of the students were **ignoring** the teacher's lesson.*

perfectionist (n) /pə(r)'fekʃənɪst/
Someone who wants everything to be just right is called a **perfectionist**.
• *Lee is such a **perfectionist**. It takes him forever to complete a task!*

selfish (adj) /'selfɪʃ/
Selfish people care more about themselves than other people.
• *The child was being **selfish** and refusing to share her toys.*

spoilt (adj) /spɔɪlt/
Someone who is **spoilt** expects to always get their way.
• ***Spoilt** children get whatever they want from their parents.*

2 Misunderstood Animals

Page 28

slimy (adj) /'slaɪmi/
If something is **slimy**, it's covered with a thick, wet, unpleasant liquid.
• *Many people think snakes are **slimy**.*

disgusting (adj) /dɪs'gʌstɪŋ/
Something that is **disgusting** is so unpleasant that you don't want to be near it.
• *Many people think that insects are **disgusting**.*

aggressive (adj) /ə'ɡresɪv/
When someone is **aggressive** they are ready to be forceful or even fight to get what they want.
• ***Aggressive** people act in a violent way.*

poisonous (adj) /'pɔɪz(ə)nəs/
A **poisonous** plant, animal or substance can cause illness or death.
• *Some spiders and frogs can hurt people because they're **poisonous**.*

pest (n) /pest/
A **pest** is an animal or insect that does damage, especially in a garden or a home.
• ***Pests**, such as small animals and insects, can cause damage.*

filthy (adj) /'fɪlθi/
Something that is **filthy** is very dirty.
• *People think that cockroaches are **filthy** animals.*

decay (v) /dɪ'keɪ/
When something **decays**, such as food or a dead creature, it begins to rot.
• *Most fruits and vegetables start to **decay** after a week.*

germ (n) /dʒɜ:(r)m/
Germs are tiny organisms that can be harmful to humans or animals.
• *Dirty litter bins are full of **germs**.*

poison (v) /'pɔɪz(ə)n/
If a person **poisons** an animal or plant, it can get sick and die.
• *The chemicals in the river **poisoned** the fish.*

destroy (v) /dɪ'strɔɪ/
To **destroy** something is to ruin it, kill it or break it apart so that it no longer functions or exists.
• *Gardeners usually get upset when insects **destroy** their plants.*

Page 29

sting (v) /stɪŋ/
Insects that **sting** have a sharp body part that they push into your skin.
• *Bees and wasps sometimes **sting** to protect themselves.*

crucial (adj) /'kru:ʃ(ə)l/
When something is **crucial**, it is very important.
• *Spiders are **crucial** because they eat other insects.*

ecosystem (n) /'i:kəʊ,sɪstəm/
The animals and plants in an area make up an **ecosystem**.
• *Removing a plant or animal from an **ecosystem** can upset its balance.*

control (v) /kən'trəʊl/
When you **control** something, you have power over what it does or what happens to it.
• *It's important to **control** some animal populations.*

beneficial (adj) /,benɪ'fɪʃ(ə)l/
Something that is **beneficial** is helpful; it brings something good to someone.
• *Misunderstood animals can be **beneficial** to humans.*

Page 30

misconception (n) /,mɪskən'sepʃ(ə)n/
A **misconception** is something that many people believe, even though it isn't true.
• *It's a **misconception** that bats can't see.*

misunderstood (adj) /,mɪsʌndə(r)'stʊd/
When someone or something is **misunderstood**, people have a false idea about them.
• *Animals such as snakes and spiders are **misunderstood**.*

unpopular (adj) /ʌn'pɒpjʊlə(r)/
When someone or something is **unpopular**, they are disliked by many people.
• *Many misunderstood animals are **unpopular**.*

untrue (adj) /ʌn'tru:/
Untrue means not true, or false.
• *It's **untrue** that snakes are slimy.*

Page 33

scared of (adj) /skeə(r)d ɒv/
People who are **scared of** something feel afraid of that thing.
• *If you're **scared of** the dark, you can use a night light.*

bite (v) /baɪt/
When an insect or animal **bites**, it uses its mouth or teeth to cause injury.
• *Both snakes and spiders can **bite**.*

hurt (v) /hɜ:(r)t/
When an injury **hurts**, you feel pain from it.
• *If a spider bites you, it can **hurt** a lot.*

calm (adj) /kɑ:m/
A **calm** person isn't worried, anxious or upset.
• *It's much easier to deal with difficulties when you are **calm**.*

upset (adj) /ʌp'set/
When someone is **upset**, they are angry or sad.
• *Many people get **upset** when they see a spider.*

venom (n) /'venəm/
Venom is a poisonous substance that some insects and animals use as a weapon.
• *Some spiders are dangerous because of their poisonous **venom**.*

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fang (n) /fæŋ/
Fangs are long, sharp teeth that some animals use for biting.
• *Both vampire bats and fruit bats have **fangs**.*
lethal (adj) /'li:θl/
If something is **lethal**, it can cause death.
• ***Lethal** bites from snakes and spiders require fast medical attention.*
lick (v) /lɪk/
To **lick** something is to touch it with your tongue.
• *Vampire bats **lick** blood with their tongues.*
suck (v) /sʌk/
When you **suck** something, you pull it into your mouth.
• *Vampire bats don't **suck** blood through their fangs.*

3 Everybody’s Doing It!

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formation (n) /fɔ:ɪ(r)'meɪʃ(ə)n/
When objects or people are arranged in a certain way, they are in a **formation**.
• *Some birds fly in a **formation** that looks like the letter V.*
migrate (v) /maɪ'greɪt/
Animals that **migrate** travel to different regions of the Earth.
• *The best time to see birds **migrate** is in the spring and autumn.*
co-ordinated (adj) /kəʊ'ɔ:ɪ(r)dɪneɪtɪd/
When an action is **co-ordinated**, people work together to make sure it happens correctly.
• ***Co-ordinated** movements are organised and carried out in the same way.*

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belong to (v) /bɪ'lɒŋ tu:/
If you **belong to** a group, you are a member of it.
• *Humans usually want to **belong to** a group.*
leader (n) /'li:də(r)/
A **leader** is the person in charge of a group or an organisation.
• *Many groups choose a **leader** to be in charge.*
assume (v) /ə'sju:m/
To **assume** something is to think it is true, even if you haven't proven it.
• *Why do you **assume** that I ate the chocolate?*
consensus (n) /kən'sensəs/
There is a **consensus** when a whole group agrees about something.
• *In a group **consensus**, members come together and agree on a decision.*
potential (adj) /pə'tenʃ(ə)l/
A **potential** problem, employer, partner, etc. may become one in the future, although they are not one now.
• ***Potential** predators will probably attack others.*
prefer (v) /prɪ'fɜ:(r)/
When you **prefer** something, you like it more than another thing.
• *Many people **prefer** coffee to tea in the morning.*
realise (v) /'ri:əlaɪz/
When you **realise** something, you become aware of it.
• *I just **realised** that I left the garage door open.*
collective (adj) /kə'lektɪv/
Something is **collective** if a whole group does it or experiences it together.
• ***Collective** behaviour is usually beneficial to a group.*
efficient (adj) /ɪ'fɪʃ(ə)nt/
When someone or something is **efficient**, they make things happen without wasted time or effort.
• *An **efficient** person is organised and doesn't waste time.*

system (n) /'sɪstəm/
A **system** is a group of things that move or work together.
• *He has a good **system** for organising his research.*
migration (n) /maɪ'greɪʃ(ə)n/
Migration is when animals move between different places at different times of year.
• *For many birds, **migration** takes place before winter.*

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assemble (v) /ə'semb(ə)l/
If a group of animals or people **assemble**, they all come together in the same place.
• *People decide when to **assemble** in groups.*
crowd (n) /kraʊd/
A **crowd** is a large group of people together in one place.
• *There was a large **crowd** of people at the concert.*
mimic (v) /'mɪmɪk/
When you **mimic** what someone does, you copy it as accurately as you can.
• *Animals can **mimic** each other's behaviour.*
remain (v) /rɪ'meɪn/
When someone or something **remains**, they stay in a certain place.
• *Some animals **remain** with their groups for safety.*

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troop (n) /tru:p/
A **troop** is a group that walks together. Both people and apes travel in troops.
• *A **troop** of chimpanzees can respond to human yawns.*
flock (n) /flɒk/
A **flock** is a group of birds, sheep or goats.
• *A **flock** of starlings changes formation to confuse predators.*
herd (n) /hɜ:(r)d/
A **herd** is a group of large animals, such as cattle, elephants or deer.
• *A **herd** of elephants is usually led by the oldest female.*
swarm (n) /swɔ:(r)m/
A swarm is a large group of insects gathered together.
• *A **swarm** of insects can be frightening to many people.*
pack (n) /pæk/
A **pack** is a group of wild animals that live and hunt together, especially those of the dog family.
• *I could hear a **pack** of wolves howling.*
school (n) /sku:l/
A **school** of fish is a group of fish that swims together in co-ordinated movement.
• *A **school** of fish can change its direction suddenly.*

influence (v) /'ɪnfluəns/
When you **influence** someone, you change the way they think or feel about something.

- *The students worked hard to **influence** the head teacher's decision.*

intention (n) /ɪn'tenʃ(ə)n/
An **intention** is a firm idea or plan to do something.

- *The group's **intention** is to focus on environmental problems.*

join (v) /dʒɔɪn/
When you **join** a group or organisation, you become a member of it.

- *Many students **join** sports teams.*

stand out (ph v) /stænd aʊt/
Someone or something that **stands out** is easy to notice because they are different from others.

- *Most teens want to be part of a group, but also **stand out** at the same time.*

4 Fashion Footprints

creativity (n) /ˌkri:ɪt'ɪvəti/
Creativity is the ability to use your imagination to do or make interesting things.

- *We can use clothing to show our **creativity**.*

style (n) /stɑɪl/
An item's **style** is its attractiveness or design.

- *Young people often have a different **style** to their parents.*

trendy (adj) /'trendi/
When something is **trendy** it has recently become very popular.

- *Many people prefer to wear **trendy** clothes that are in style.*

designer (n) /dɪ'zaɪnə(r)/
A **designer** thinks about how something should look or work and then makes a plan for it.

- ***Designers** draw their ideas first, and then make them into clothes.*

fit in (ph v) /fɪt ɪn/
People who **fit in** have the same values, ideas, or look as the others around them.

- *Most teens want to **fit in** with others at school.*

have an impact (phr) /hæv ən 'ɪmpækt/
When you **have an impact** on someone or something, you affect it in some way.

- *The fashion choices we make **have an impact** on the environment.*

footprint (n) /'fʊt,prɪnt/
Your **footprint** is the negative environmental impact left behind by some of your activity.

- *People can buy less to reduce their fashion **footprint**.*

take responsibility for (phr) /teɪk rɪˌspɒnsə'bɪlətɪ fə(r)/
When you **take responsibility for** something, you agree that it is your duty and you do it.

- *It's important to **take responsibility for** our choices.*

do one's part (phr) /duː wʌnz pɑː(r)t/
When you **do your part**, you are involved in something that requires many people working together.

- *Let's **do our part** to reduce our fashion footprint.*

material (n) /mə'tɪəriəl/
A **material** is something that is used to make something else.

- *Clothing can be made of many different **materials**.*

cotton (n) /'kɒt(ə)n/
Cotton is a soft, natural fabric made from fibres of the cotton plant.

- *Our jeans and T-shirts are made from **cotton**.*

synthetic (adj) /sɪn'θetɪk/
Something that is **synthetic** does not exist in nature and has to be made by some process.

- ***Synthetic** materials don't come from plants or animals.*

toxic chemical (n) /ˌtɒksɪk 'kemɪk(ə)l/
A toxic chemical is a substance that can be poisonous to people or animals.

- *To produce clothing, **toxic chemicals** are sometimes released into the air and water.*

manufacture (n) /ˌmænjʊ'fæktʃə(r)/
Manufacture is the process of making something in a factory.

- *The **manufacture** of some clothing uses a lot of water and energy.*

attractive (adj) /ə'træktɪv/
An **attractive** person is one who others think is handsome, pretty or good-looking.

- *The clothes we wear can make us feel **attractive**.*

popular (adj) /'pɒpjʊlə(r)/
When someone or something is **popular**, a lot of people like them and identify with them.

- *A lot of people wear clothes from the most **popular** designers.*

psychological (adj) /ˌsaɪkə'lɒdʒɪk(ə)l/
Psychological means connected with your mind and feelings, rather than your body.

- *We choose clothes for **psychological** reasons, such as feeling good and fitting in.*

social (adj) /'səʊʃ(ə)l/
Something is **social** when it relates to a group of people together, often doing something enjoyable.

- *We dress up for **social** events like parties.*

ship (v) /ʃɪp/
To **ship** a product means to send it to another place, for example, from a shop to a customer.

- *Jeans are **shipped** around the world.*

assemble (v) /ə'semb(ə)l/
To assemble something is to put its parts together to form a whole.

- *A pair of jeans is **assembled** very quickly.*

factory (n) /'fæktri/
A factory is a place where people work with machines to make or build things.

- *Jeans are made in **factories**.*

warehouse (n) /'weə(r),haʊs/
A **warehouse** is a place for storing products before they go to shops or to buyers.

- *Jeans are sent from the factory to a **warehouse**.*

retailer (n) /'riːteɪlə(r)/
A **retailer** is a shop where people go to buy items they want or need.

- ***Retailers** sell things to the final users, not to other shops.*

purchase (v) /'pɜː(r)tʃəs/
When you purchase something, you give money in exchange for it.

- *Most people **purchase** jeans at retailers.*

donate (v) /dəʊ'neɪt/
When you **donate** money or things, you give them away to help someone.

- *It's best to **donate** clothes that don't fit you.*

eco-friendly (adj) /,i:kəʊ 'fren(d)li/
An activity or product that is **eco-friendly** is not harmful to the environment.

- *Natural materials are more **eco- friendly** than synthetic materials.*

entrepreneur (n) /,ɒntrəprə'nɜ:(r)/
An **entrepreneur** is someone who starts their own business.

- *Santana Draper is a young **entrepreneur** with his own business.*

give back (ph v) /gɪv bæk/
When you **give back**, you help others because you appreciate what they have done for you.

- *Some people like to **give back** to the community when they have more than they need.*

profit (n) /'prɒfɪt/
Profit is the money that a company keeps after it has paid all of its workers and all of its bills.

- *She donates 10 to 20 per cent of her **profits** to charities.*

5 Flying High

flight (n) /flaɪt/
Flight happens when an animal or machine moves through the air.

- ***Flight** developed first in insects.*

limited (adj) /'lɪmɪtɪd/
When someone or something is **limited**, it does not go beyond a certain place or amount.

- *Millions of years ago, all life was **limited** to land and water.*

early (adj) /'ɜ:(r)li/
When talking about history or things in the past, **early** means a very long time ago.

- ***Early** insects were the first animals to fly.*

evolve (v) /'ɪvɒlv/
When animals **evolve**, they change slowly over many generations in order to live better in their habitat.

- *All species **evolve** over time.*

glide (v) /glɑɪd/
To **glide** is to move along through the air without much effort.

- *Many species developed the ability to **glide**.*

flap (v) /flæp/
To **flap** a body part means to move it up and down or back and forth very quickly.

- *Animals **flap** their wings to fly.*

hollow (adj) /'hɒləʊ/
Something that is **hollow** is not solid in the middle; it has air or space inside.

- *Birds have light, **hollow** bones that allow them to fly.*

soar (v) /sɔ:(r)/
When an animal **soars**, it spreads its wings and lets the wind carry it.

- *Large birds can **soar** when they spread their wings.*

weight (n) /weɪt/
An object's **weight** is how heavy it is.

- *An animal's **weight** can affect how it flies.*

wingspan (n) /'wɪŋ.spæn/
The **wingspan** of a plane or a bird is the distance from the tip of one wing to the other when the wings are spread open.

- *The **wingspan** of the largest pterosaur was over ten metres.*

feature (n) /'fi:tʃə(r)/
A **feature** is a quality or characteristic of someone or something.

- *Ancient birds had some of the same **features** as dinosaurs.*

adaptation (n) /,ædæp'teɪʃ(ə)n/
An **adaptation** is a change that happens in a person or animal that makes its life easier.

- *Physical **adaptations** helped birds become better fliers.*

capability (n) /,keɪpə'bɪləti/
When you have the **capability** to do something, you are able to do it.

- *Bats are the only mammals with flight **capability**.*

allow (v) /ə'laʊ/
If something **allows** someone or something to do something, it makes it possible for them to do it.

- *Their hollow bones and light bodies **allow** birds to fly.*

powered (adj) /'paʊə(r)d/
When something is **powered**, it gets the energy that it needs to work from a certain source, such as fuel.

- *Bats are the only mammals capable of **powered** flight.*

skilled (adj) /skɪld/
When you are **skilled** at something, you have practised it enough to be really good at it.

- *Both birds and bats are **skilled** fliers.*

support (v) /sə'pɔ:(r)t/
To **support** something is to help it in some way.

- *Insects' wing structures **support** them when they fly.*

prove (v) /pru:v/
If you prove something, you show that it is true.

- *Scientists examine theories, and look for ways to **prove** them.*

force (n) /fɔ:(r)s/
A **force** is something that has physical power to move, stop, or hold other things.

- *Gravity is the **force** that keeps objects from staying in the air.*

parachute (n) /'pærəʃu:t/
A **parachute** is piece of equipment with a large cloth used to slow down something that is falling from the sky.

- *Skydivers use **parachutes** when they jump out of planes.*

ascend (v) /ə'send/
To **ascend** is to go up. You can ascend a tree or a ladder, or you can ascend into the air.

- *An aeroplane **ascends** into the air at an angle.*

descend (v) /dɪ'send/
To **descend** is to go down.

- *A helicopter **descends** slowly when it lands.*

stable (adj) /'steɪb(ə)l/
When something is **stable**, it is steady and is not easily disturbed by outside forces.

- *A **stable** glider or aeroplane does not move from side to side as it flies.*

engine (n) /'endʒɪn/
An **engine** is the part of a machine that uses fuel to supply power.
• *Modern aeroplanes have powerful **engines**.*

fuel (n) /'fjuːəl/
Fuel is a substance such as gas or oil that is burnt to provide power.
• *An aeroplane loses power when it runs out of **fuel**.*

land (v) /lænd/
When a plane or a bird **lands**, it comes to the ground after being in the air.
• *When the plane **lands**, you arrive at the airport.*

pilot (n) /'paɪlət/
A **pilot** is the person who controls an aeroplane while it is moving.
• *A **pilot** controls an aeroplane.*

take off (ph v) /teɪk ɒf/
When a plane or rocket **takes off**, it leaves the ground and starts flying.
• *You have to be seated before the plane will **take off**.*

6 New Frontiers

satellite (n) /'sætəlaɪt/
A **satellite** is a machine sent into outer space to move around a planet or moon in order to get information about it.
• ***Satellites** in outer space help us to learn more about the planets.*

aspect (n) /'æspekt/
An **aspect** is a part of something or a quality that you can identify in it.
• *Some **aspects** of the Earth and Mars are similar.*

atmosphere (n) /'ætməsˌfɪə(r)/
The **atmosphere** of the Earth or another planet is the mixture of gases that surround it.
• *Gases in the air make up the Earth's **atmosphere**.*

landscape (n) /'lænd(ɪ)skeɪp/
A **landscape** is all the features of land. For example, mountains and hills make up a landscape.
• *The **landscapes** of Mars and Earth are similar in certain places.*

plain (n) /pleɪn/
A **plain** is a large, flat area of land.
• *They own a farm on the eastern **plains** of Colorado.*

degree (n) /dɪ'ɡriː/
A **degree** is a unit of measurement used to measure angles and temperatures.
• *Both Earth and Mars tilt on their axes at an angle of about 24 **degrees**.*

wonder (v) /'wʌndə(r)/
If you **wonder** about something, you are curious about it and want to know more.
• *People **wonder** if there is life beyond Earth.*

dust (n) /dʌst/
Dust is tiny particles of soil and other substances that can fill the air.
• *Wind blows sand and dirt to cause a **dust** storm.*

valley (n) /'væli/
A **valley** is the space between two mountains that often has a river in it.
• *Mars has tall mountains and deep **valleys**.*

instrument (n) /'ɪnstɹʊmənt/
An **instrument** is a tool used to do some jobs such as measuring, detecting, marking or recording.
• *Scientific **instruments** have shown that water exists on Mars.*

detect (v) /dɪ'tekt/
When you **detect** something, you notice that it is there.
• *Scientists **detected** signs of water under the surface of Mars.*

proof (n) /pruːf/
Proof is evidence that something is true or that it exists.
• *Scientists are looking for proof that life could exist on Mars.*

fundamental (adj) /ˌfʌndə'ment(ə)l/
A **fundamental** part of something is the most important part.
• *Water is **fundamental** for all living things.*

vast (adj) /vɑːst/
Vast means very large.
• *Polar caps are **vast** areas covered with ice.*

lead to (ph v) /liːd tuː/
If one thing **leads to** another thing, the first thing is the reason that the second thing can happen.
• *New technologies will **lead to** more discoveries on Mars.*

advance (n) /əd'vɑːns/
An **advance** is an improvement or a move that makes something better than before.
• *Technological **advances** have allowed scientists to study the landscape of Mars.*

astronomer (n) /ə'strɒnəmə(r)/
An **astronomer** is a person who studies stars and other bodies in the universe.
• ***Astronomers** are looking for proof of life beyond Earth.*

equip with (ph v) /ɪ'kwɪp wɪθ/
When you provide someone or something with necessary tools, you **equip** them **with** those things.
• *Scientists **equipped** the rover **with** useful instruments to study Mars.*

requirement (n) /rɪ'kwaɪə(r)mənt/
A **requirement** is something you must have, or something that must be done.
• *One of the **requirements** for life as we know it is water.*

geyser (n) /'ɡiːzə(r)/
A **geyser** is a hole in the ground that shoots out water and steam.
• *Yellowstone National Park is famous for its **geysers**.*

diameter (n) /daɪ'æmɪtə(r)/
The **diameter** of a circle is straight line that joins two edges and passes through the centre.
• *The **diameter** of a circle is equal at all points.*

hazy (adj) /'heɪzi/
When the air or the sky is **hazy**, it is not clear as a result of pollution, dust or smoke.
• *A **hazy** sky is darkened by clouds and dust.*

seasonal (adj) /'siːz(ə)nəl/
Something that depends on the time of the year is **seasonal**.
• ***Seasonal** changes include variations in temperature and the amount of sunlight.*

aspiring (adj) /ə'spaɪərɪŋ/
When a person wants to become something, we say he is an **aspiring** writer, musician, etc.

- An **aspiring** astronaut wants to travel in space one day.

background (n) /'bækgraʊnd/
Your **background** is all the experience and education from your past that influences who you are.

- Astronauts need to have a strong **background** in maths and science.

chance (n) /tʃɑ:ns/
A **chance** is an opportunity to do or achieve something.

- Alyssa Carson had the **chance** to go to Space Camp.

leadership (n) /'li:də(r)ʃɪp/
Leadership is the quality that some people have to be good leaders.

- A successful space mission takes patience and strong **leadership**.

perseverance (n) /ˌpɜ:(r)sɪ'vɪərəns/
Perseverance is the quality of being able to keep trying, even when a situation is very difficult.

- If you have **perseverance**, you're determined to reach your goal.

7 Visual Stories

meaningful (adj) /'mi:nɪŋf(ə)l/
When something is **meaningful**, it is very important or special to someone.

- This old photo of my grandparents is really **meaningful** to me.

oral (adj) /'ɔ:rəl/
Oral means spoken, rather than written.

- Many cultures pass down stories through **oral** traditions.

visual (adj) /'vɪʒʊəl/
When something is **visual**, people look at it for pleasure or to help them understand something.

- **Visual** stories can be told through painting and photography.

image (n) /'ɪmɪdʒ/
An **image** is a picture, such as a photograph, a drawing or a painting.

- The **images** in the magazine tell an incredible story.

canvas (n) /'kænvəs/
Canvas is a strong cloth that is often used for paintings.

- **Canvas** is stretched onto a frame and then stapled to hold it in place.

represent (v) /ˌreprɪ'zent/
When something **represents** another thing, it gives the meaning of that thing.

- To me, this painting **represents** the artist's feelings about the situation.

scene (n) /si:n/
The **scene** of a work of art, theatre or literature is the place it represents.

- In this rural **scene**, we can see trees and animals in a field.

witness (n) /'wɪtnəs/
A **witness** is someone who sees something happen, such as a crime or important event.

- After the event, **witnesses** talked about what they saw.

portrait (n) /'pɔ:(r)trɪt/
A portrait is a photograph or a painting of a person.

- It was a **portrait** of a beautiful girl.

portray (v) /pɔ:(r)'treɪ/
When someone **portrays** someone or something, they represent or describe it.

- This photograph **portrays** the love the family shared.

audience (n) /'ɔ:diəns/
The **audience** is the group of people who listen to or watch a performance or speech, look at a work of art or read a text.

- A photographer can't always be sure how an **audience** will react to a photo.

anger (n) /'æŋɡə(r)/
Anger is the bad feeling that comes from being mad or upset with someone or something.

- When you feel **anger**, you are upset.

shock (n) /ʃɒk/
Shock is a feeling of great surprise when something completely unexpected happens.

- When you are really surprised, you may be in **shock**.

subject (n) /'sʌbdʒɪkt/
The **subject** of a work of art is the person, place, thing or idea being represented.

- Three children were the **subject** of the painting.

understanding (n) /ˌʌndə(r)'stændɪŋ/
Understanding is knowledge about something that you get from experience of it.

- When we travel, we have a better **understanding** of how other people live.

capture (v) /'kæptʃə(r)/
When a photograph or work of art **captures** something, it shows it very successfully.

- This old photograph really **captures** my aunt's youth.

certain (adj) /'sɜ:(r)t(ə)n/
The word **certain** is used to describe a person, place or thing without giving specific information.

- Photos can create **certain** emotions such as anger or sadness.

last (v) /lɑ:st/
When something **lasts** it exists over time.

- Photographs help to make our memories **last** longer.

permanent (adj) /'pɜ:(r)mənənt/
Permanent means lasting forever, or for as long as anyone thinks about.

- This painting is part of the museum's **permanent** collection.

landscape (n) /'læn(d)ʃkeɪp/
A **landscape** is a painting that shows scenes from nature.

- The exhibition had several important early American **landscapes**.

masterpiece (n) /'mɑ:stə(r),pi:s/
An artist's **masterpiece** is their most famous or important work of art.

- Da Vinci's Mona Lisa is considered his **masterpiece**.

realistic (adj) /ˌrɪə'lɪstɪk/
When something is **realistic**, it appears as it does in real life.

- **Realistic** art became less popular after photography was invented.

abstract (adj) /'æbstrækt/
Abstract art does not show objects that you can easily recognise.

- **Abstract** paintings can be difficult to understand.

animation (n) /æni'meɪʃ(ə)n/
Animation is a process that uses a series of drawings or graphics to create a moving scene.

- With **animation**, an artist tells a story with a series of pictures.

cartoon (n) /kɑː(r)'tuːn/
A **cartoon** is an animated film or television programme, usually created for children.

- Many children enjoy watching **cartoons** on TV.

illustrator (n) /'ɪləstreɪtə(r)/
An **illustrator** makes drawings for books, magazines or animated shows.

- **Illustrators** create characters using pencil and paper.

method (n) /'meθəd/
A **method** is a particular way of doing something that is broken down into steps.

- The traditional animation **method** requires thousands of drawings.

sophisticated (adj) /sə'fɪstɪkeɪtɪd/
Something that is **sophisticated** is advanced and complicated.

- Digital animation is much more **sophisticated** than traditional animation.

8 Why We Explore

knowledge (n) /'nɒlɪdʒ/
Knowledge is information learned from education and experience.

- Doctors have a great deal of **knowledge** about the human body.

investigate (v) /ɪn'vestɪgeɪt/
To **investigate** something is to really study it in order to learn everything there is to know about it.

- New discoveries are made when we **investigate** unknown places.

pioneer (n) /ˌpaɪə'niə(r)/
A **pioneer** is someone who does something or goes somewhere before anyone else.

- Astronauts are **pioneers** of space.

research (v) /rɪ'sɜː(r)tʃ/
To **research** a topic is to study it carefully in order to learn new information about it.

- Sylvia Earle **researches** marine life.

drive (v) /draɪv/
If something **drives** you, that thing makes you want to work hard.

- The desire to learn new things **drives** people to keep exploring.

purpose (n) /'pɜː(r)pəs/
The **purpose** of an activity or a thing is the reason why it is done or used.

- What is the **purpose** of exploring the ocean floor?

remote (adj) /rɪ'məʊt/
A place is **remote** if it is far away from cities or developed places.

- We still haven't seen many **remote** parts of the ocean.

curious (adj) /'kjʊəriəs/
When you are **curious**, you are very interested in learning more about a subject.

- **Curious** people make great discoveries.

exciting (adj) /ɪk'saɪtɪŋ/
Something is **exciting** if it creates a lot of interest or enthusiasm.

- It is **exciting** to be an explorer.

expert (adj) /'ekspɜː(r)t/
Someone who is **expert** at something has special knowledge and skill in it from many years of experience.

- Corey Jaskolski is an **expert** camera builder.

high-tech (adj) /ˌhaɪ'tek/
A process or device is **high-tech** when it involves sophisticated or modern technology.

- **High-tech** tools help scientists explore without harming sites.

look into (ph v) /lʊk 'ɪntə/
To **look into** something is to take time and effort to learn everything about it.

- Scientists have **looked into** how animals evolve.

encounter (v) /ɪn'kaʊntə(r)/
To **encounter** something is to meet it or come across it, especially when you were not expecting to.

- Ocean explorers **encounter** a wide variety of life forms.

achievement (n) /ə'tʃiːvmənt/
An **achievement** is a positive result that you get after a lot of effort.

- Scientists are rewarded for their **achievements** with awards or honours.

encourage (v) /ɪn'kʌrɪdʒ/
When you **encourage** someone, you say or do things to support them and make them feel confident.

- Exploring the Earth will **encourage** people to protect it.

engage in (ph v) /ɪn'geɪdʒɪn/
When you **engage in** something, you do it in an active and interested way.

- We learn about the world by **engaging in** exploration.

require (v) /rɪ'kwaɪə(r)/
When something **requires** another thing, it needs it in order to function or exist.

- Becoming an oceanographer **requires** a lot of training.

route (n) /ruːt/
A **route** is a way to get from one place to another.

- Barrington's **route** took him through extreme weather.

motion (n) /'məʊʃ(ə)n/
Motion is the act of moving.

- Strong winds can affect the **motion** of an aeroplane.

globe (n) /gləʊb/
The **globe** is another way of saying Earth or world.

- There are still many places on the **globe** left to explore.

set a record (phr) /set ə 'rekɔː(r)d/
When someone **sets a record**, they do something better or faster than anyone has ever done it.

- Barrington **set a record** as the youngest person to fly around the world.

educate (v) /'edʒukeɪt/
To **educate** someone is to teach them about a topic.

- Barrington works to **educate** young people about flying.

associated (adj) /ə'səʊsi.eɪtɪd/
When two or more people, things, or ideas are connected with each other, they are **associated**.
• *Exploration is often **associated** with discovery and risk-taking.*

gene (n) /dʒi:n/
A **gene** is a part of your DNA that influences how you look and develop.
• *Scientists are researching how our **genes** affect us.*

motivate (v) /'məʊtɪveɪt/
When something **motivates** you, it gives you a reason for wanting to do something.
• *Curiosity **motivates** humans to explore.*

trait (n) /treɪt/
A **trait** is a physical or emotional characteristic.
• *Members of a family often share the same **traits**.*



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Student's Book: Level 3
ISBN: 978-0-357-64428-7

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