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Impact 3
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ON THE COVER

Light trails reflection over the stream, Incheon, South Korea

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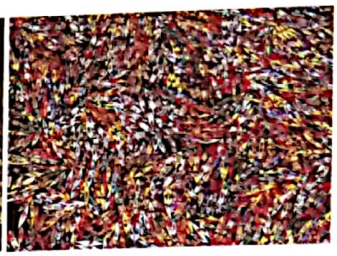
impact 3

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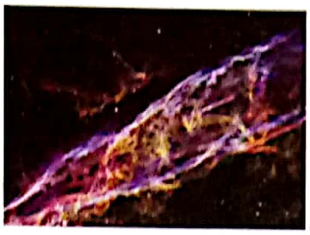
Scope and Sequence






	1 **Who Am I?** page 8	2 **Misunderstood Animals** page 24	3 **Everybody's Doing It!** page 42	4 **Fashion Footprints** page 58
THEME	Teen identity and personality	Animals in popular culture	Human and animal group behavior	Making responsible fashion choices
VOCABULARY STRATEGY	· Suffix *-ous* · Using context	· Prefixes *mis-* and *un-* · Using a thesaurus	· Synonyms · Definitions and examples	· Suffix *-al* · 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 *Alicia is friendly, isn't she?* **Special uses of *it*:** *I hate it when the alarm goes off.*	**Modals:** Speculating about the past *He refuses to go in the water. He might have seen a jellyfish.* **Infinitives with and without *to*:** *He doesn't want to hold rats. Make him try it.*	**Separable and inseparable phrasal verbs:** *They worked out a solution.* ***Enough, too many, too much*:** Talking about amounts: *I have enough pillows, but there are not enough feathers. I need more.*	**Present passive:** Describing actions and processes *A lot of pesticides are used to grow cotton.* **Modals:** Making suggestions and giving advice about present and past actions *You shouldn't have bought that leather jacket.*
READING	*Why Am I Me?*	*Vampire Bats – The Truth Exposed!*	*Humans in Groups*	*A Passion for Fashion*
READING STRATEGY	Identify descriptive words	Distinguish supporting details	Look for definitions and examples	Compare and contrast
VIDEO	*What Makes Up an Identity?*	*Face-to-Face with a Leopard Seal*	*Smarter by the Swarm*	*How Your T-Shirt Can Make a Difference*
MISSION	**Be Determined** National Geographic Explorer: **Jack Andraka**, Inventor	**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** Focus: Describe purpose and sequence	Genre: **Exemplification essay** Focus: Give examples	Genre: **Persuasive essay** Focus: Introduce facts and opinion
PRONUNCIATION	Intonation in question tags	Modals + *have* + past participle	Pausing	*Shouldn't have* + past participle
EXPRESS YOURSELF	Creative Expression: **Flash fiction** *A Day in the Life*		Creative Expression: **Poem** *The Garb Age*	
	Making connections: Teen identity and misunderstood animals		Making connections: Fashion trends and group behaviour	

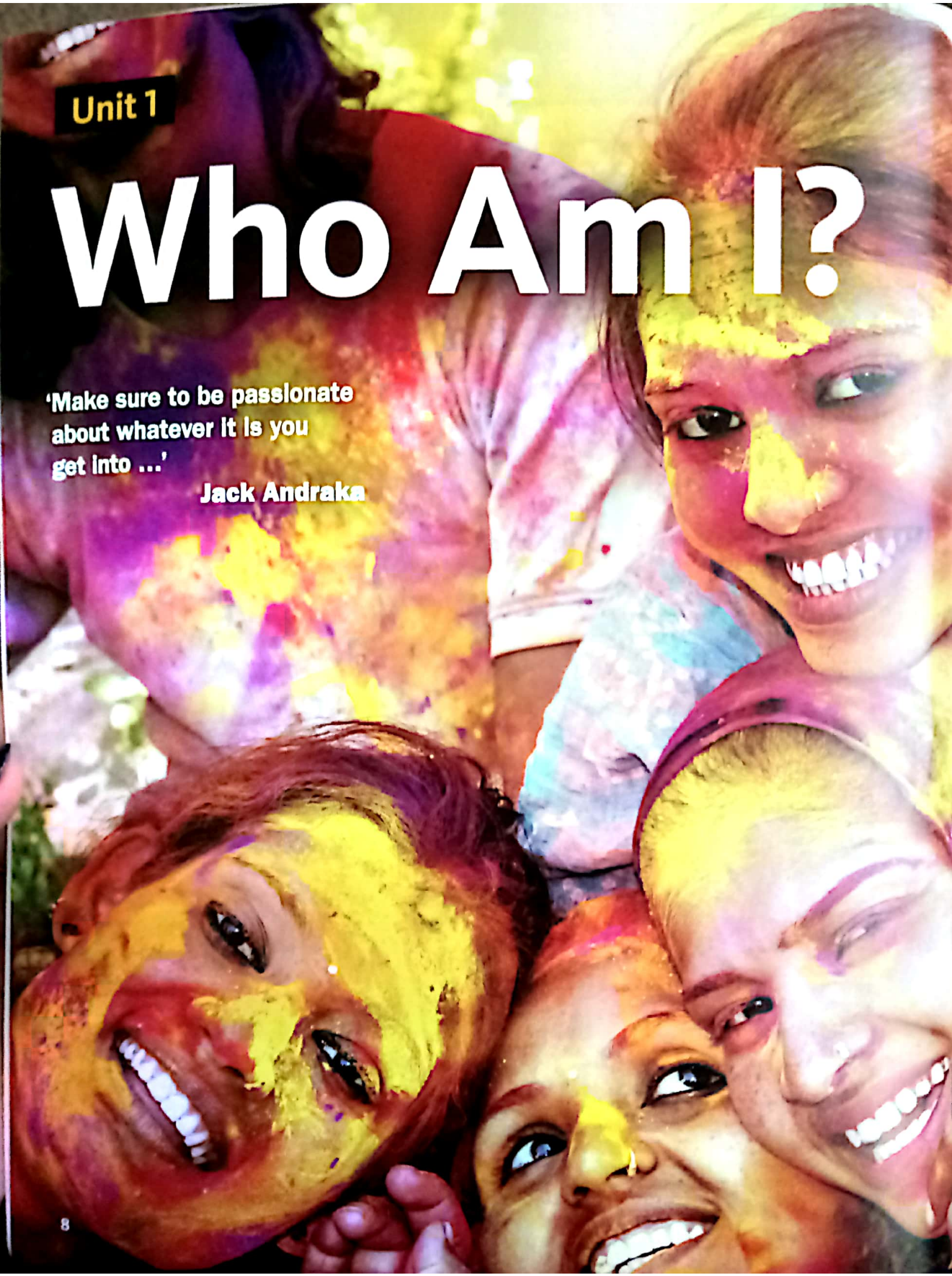
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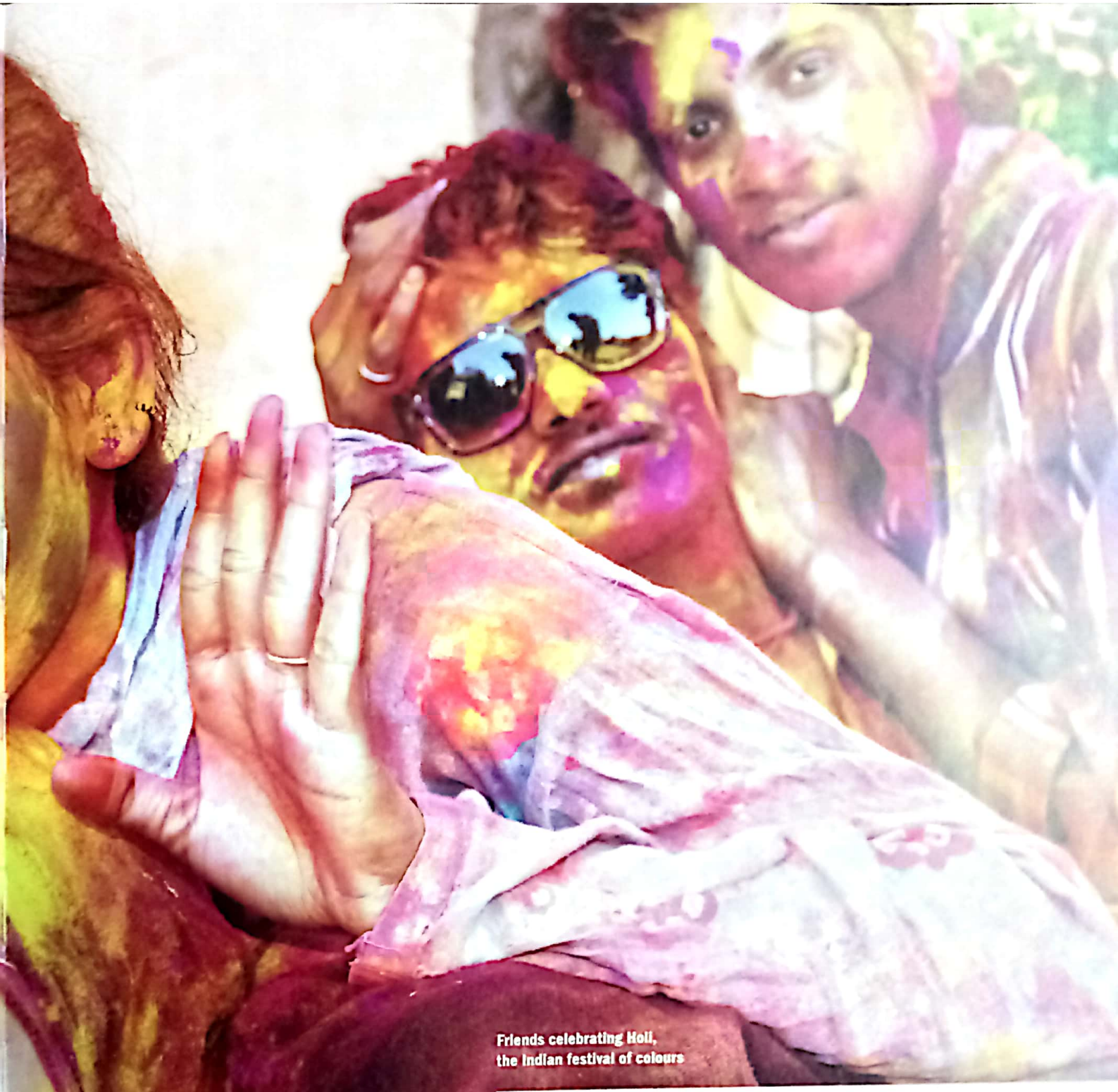


	5 **Flying High** page 76	6 **New Frontiers** page 92	7 **Visual Stories** page 110	8 **Perform and Create** page 126
THEME	Evolution of animal and human flight	Space exploration	Telling visual stories	Art as expression
VOCABULARY STRATEGY	· Root words (*port*) · Using a dictionary	· Greek roots (*astro*) · Using a dictionary: Word parts	· Multiple-meaning words · Using a thesaurus	· Greek and Latin roots · Antonyms
SPEAKING STRATEGY	Arguing and conceding	Speculating	Explaining a process	Asking for and expressing feelings or opinions
GRAMMAR	**Past perfect:** Talking about the first of two actions in the past *Pterosaurs had already disappeared by the time humans evolved.* **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.*	**Present and past conditionals:** Talking about unlikely (but possible) or impossible situations *If I had known there was a talk about Mars, I would have gone.* **Adverbs:** Comparing how things are done *The new rover travels faster than the last rover.*	**Past passive:** Describing past actions and processes *Many of Goya's works were created at night, by the light of a hat that had candles on it.* **Reported speech:** Describing what others say *She said she would save her money for art supplies.*	**Gerunds and infinitives:** *Some people like performing/to perform as comedians.* **Sense verbs + infinitive:** Describing what you see, hear and feel *Did you see the band perform in concert?*
READING	*Reaching for the Sky*	*More Than a Dream*	*Bringing Stories to Life*	*Music for Chilling Out*
READING STRATEGY	Identify sequence of events	Categorise and classify	Mark up text	Draw conclusions
VIDEO	*Flight of the RoboBee*	*Europa: Ocean World*	*Animation Creation*	*Stage Fright in the Spotlight*
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**	**Do Your Own Thing** National Geographic Explorer: **Paul D. Miller, aka DJ Spooky,** Artist/Writer/Musician
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: **Explanatory essay** Focus: Teach about a topic
PRONUNCIATION	Past perfect	Final *d + you*	Final */ə/* sound	Rhythm and stress
EXPRESS YOURSELF	Creative Expression: **Film script** *Mission: Discovery!*		Creative Expression: **Presentation** *Not Your Typical Performance*	
	Making connections: The history of flight and space exploration		Making connections: Telling stories through art and performance	

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Friends celebrating Holi, the Indian festival of colours

TO START

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. Now think of five or six words that you would never use to describe yourself.
3. What are you passionate about? Why?

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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 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 and your culture. Your identity includes your beliefs, your values and your actions. You learnt your values from your family, but, as a teenager, you may become less interested in what your family thinks. You may choose to spend more time with other people whose values and personalities are like yours. That's natural.

Then there's **personality**, or the qualities that make you different from other people. If you love parties and are **enthusiastic** about meeting lots of new people, you're probably **outgoing** and **self-confident**. 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 might enjoy helping by spending time with animals at a shelter, or by participating in a local clean-up event.



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Personality is tricky. You might assume that everyone sees you the way you see yourself, but that isn't always true. Friends 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 stubborn, or unwilling to take advice. You may feel self-conscious 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.

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?

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4 **Read and write the words from the list.**

ambitious	determined	enthusiastic	generous
optimistic	organised	outgoing	self-confident

By the time Jack Andraka was 14 years old, he was very _____ about science. Jack really wanted to focus on cancer research. He came up with a cheap, fast way to detect a type of cancer. When he first proposed his idea, some adults thought that Jack was being too _____, but he was _____ to prove them wrong. He stayed _____ and entered his idea into an international science fair. Jack won! Now he feels more _____. People have even asked him to be on TV because of his _____ personality and creative ideas.

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

fair	odd	self-conscious	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. Oh, come on. Nobody is looking at you. Let's dance.

2014 Emerging Explorer, Inventor Jack Andraka



6 **YOU DECIDE** **Choose an activity. Work in pairs.**

1. Together, think of a famous person, such as a singer, actor or internet personality. Separately, list as many descriptive words as you can about that person. Are any of your words the same? Do you agree with your partner's description?
2. As a student, you're an expert on teachers. 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. Then write a word that describes your partner for each letter. When you've finished, compare your name poems. Do you agree with your partner's description?

MUSICAL
AMBITIOUS
RESPONSIBLE
CURIOUS
ORGANISED

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SPEAKING STRATEGY 006

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

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 aunt and uncle are visiting this week.

Nina: You don't seem very happy about it.

Dave: I'm not. My aunt is always saying, 'You're _____ your uncle Jack!'

Nina: Well, are you and your uncle _____?

Dave: No, we're very different. _____ him, I'm active and outgoing. All he does is watch TV.

Nina: 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 your parents. Are you like or unlike your parents? Do your classmates' parents seem like or unlike your own parents?

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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

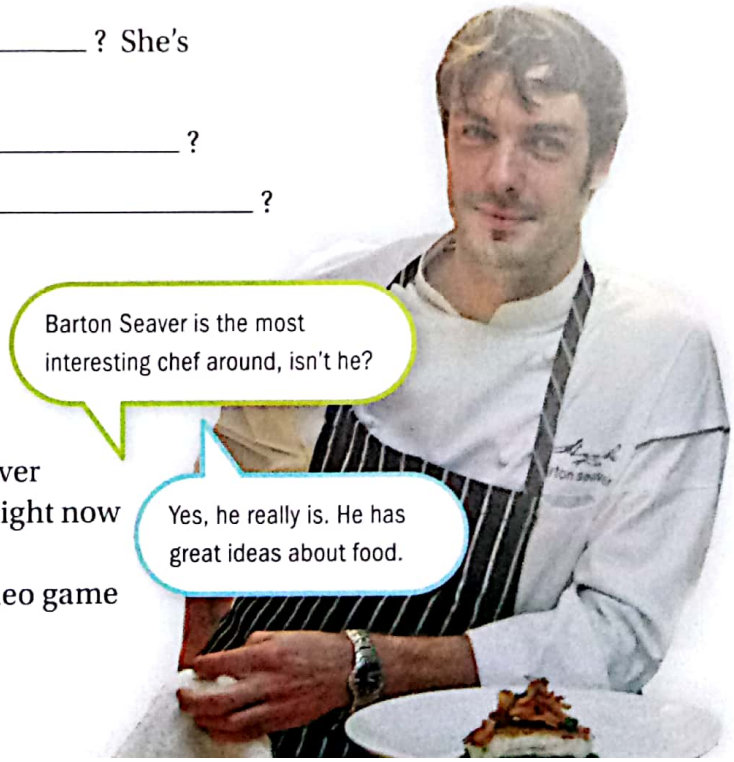
1. _____ a. Yes, it was. And we finally won!
2. _____ b. Yes, I have to be. I'm a teacher.
3. _____ c. No, she didn't. She said she was ill.
4. _____ d. He really is. He never stops!
5. _____ e. Yes, she can. And the guitar, too.



2 Read. Then complete the question tags.

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

National Geographic Fellow
Chef Barton Seaver



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

1. (name of a place) / most beautiful / place / ever
2. (name of a singer) / most popular / singer / right now
3. (name of an actor) / talented / actor / on TV
4. (name of a video game) / your favourite / video game
5. (name of a film) / exciting / film / ever

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

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.

1. Angela really is a talented cook. I want to be like her!
   You aren't feeling jealous, are you?
2. Pat and Tim refused to talk to Julia, or even listen to her ideas.
   _____
3. The Whitley twins have 17 tennis trophies between them.
   _____
4. Sam won't join the group to help collect and recycle plastic bottles.
   _____
5. Here, let me help you clean up those dishes.
   _____

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

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** **Notice descriptive words you think apply to you personally.** 013



Why Am I Me?

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

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 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 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 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 their friends than by their family, perhaps because they get more attention from their friends.

The youngest child is described as the baby of the family. They can be spoilt by their 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-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. 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.

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VIDEO

1 **BEFORE YOU WATCH** **Discuss in pairs.** Look at the photo. What do the group members' clothes say about their identity?

2 **Work in pairs.** The video you are going to watch is called *What Makes Up an Identity?* From the title, predict the main idea of the video. Circle the correct letter.

a. The video will discuss your identity in comparison to that of your family and friends.

b. The video will talk about things that you like and do that help shape your identity.

c. The video will suggest ways you can make yourself better.



Rea Iktetsa Pantsula, a dance group from Soweto, Johannesburg, South Africa

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3 **WHILE YOU WATCH** **Tick the factors that the video says are important parts of your identity.** **Watch scene 1.1.**

☐ sports ☐ clothes ☐ gadgets ☐ food

☐ music ☐ house ☐ pets ☐ other people

4 **AFTER YOU WATCH** **Work in pairs.** Circle the correct letter.

1. According to the research, music can make us happier and _____.
   a. cleverer b. more organised c. more determined
2. A personal style is important to help you _____.
   a. fit in b. stand out c. both a and b
3. One in _____ teens is obsessed with wearing designer clothing.
   a. two b. four c. twenty
4. Nearly all teenagers associate _____ with happy memories.
   a. music b. clothes c. food
5. Parents help _____.
   a. influence our world view b. choose our friends c. choose our music

5 **Work in pairs.** The video describes four main areas that make up your identity. Discuss each of those areas in your own life.

6 **Discuss in groups.** At the end of the video, you're asked, 'What else makes you *you*?' Answer the question in your group. Then share your responses with the class.

7 **YOU DECIDE** **Choose an activity.**

1. **Work independently.** Choose a classmate or teacher to interview about what makes up his or her identity. Write a profile of this person and share it with the class.
2. **Work in pairs.** Write a description of your clothing in relation to your identity. Your partner does the same. Then compare your results. Does your partner have the same view of your style as you do? Discuss. Then swap roles.
3. **Work in groups.** Create a 'happy memory' cookbook. Survey at least five classmates about meals that give them happy memories. Ask the classmates to describe the meals. Take notes, and then compile the information into a cookbook to share with the class.

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GRAMMAR 014

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

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

It drives me crazy when my friends don't return my texts!



Go to page 155.

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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.

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 grandfather, although we're different in some ways, too.



My grandfather and I both like spending time outside. We both enjoy riding our bikes and watching sports. We're adventurous, too. I really like going fishing with my grandfather. We'll catch our dinner together, then cook and eat it at our campsite. We both love nature. We're alike in that way. We also enjoy working in his garden growing fruit and vegetables.

It's a different story when winter comes. Unlike my grandfather, I love being outside in the snow. I like having snowball fights with my friends, but he likes sitting by the fire and reading. Sometimes he 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 grandfather isn't competitive at all. He's also sort of slow!

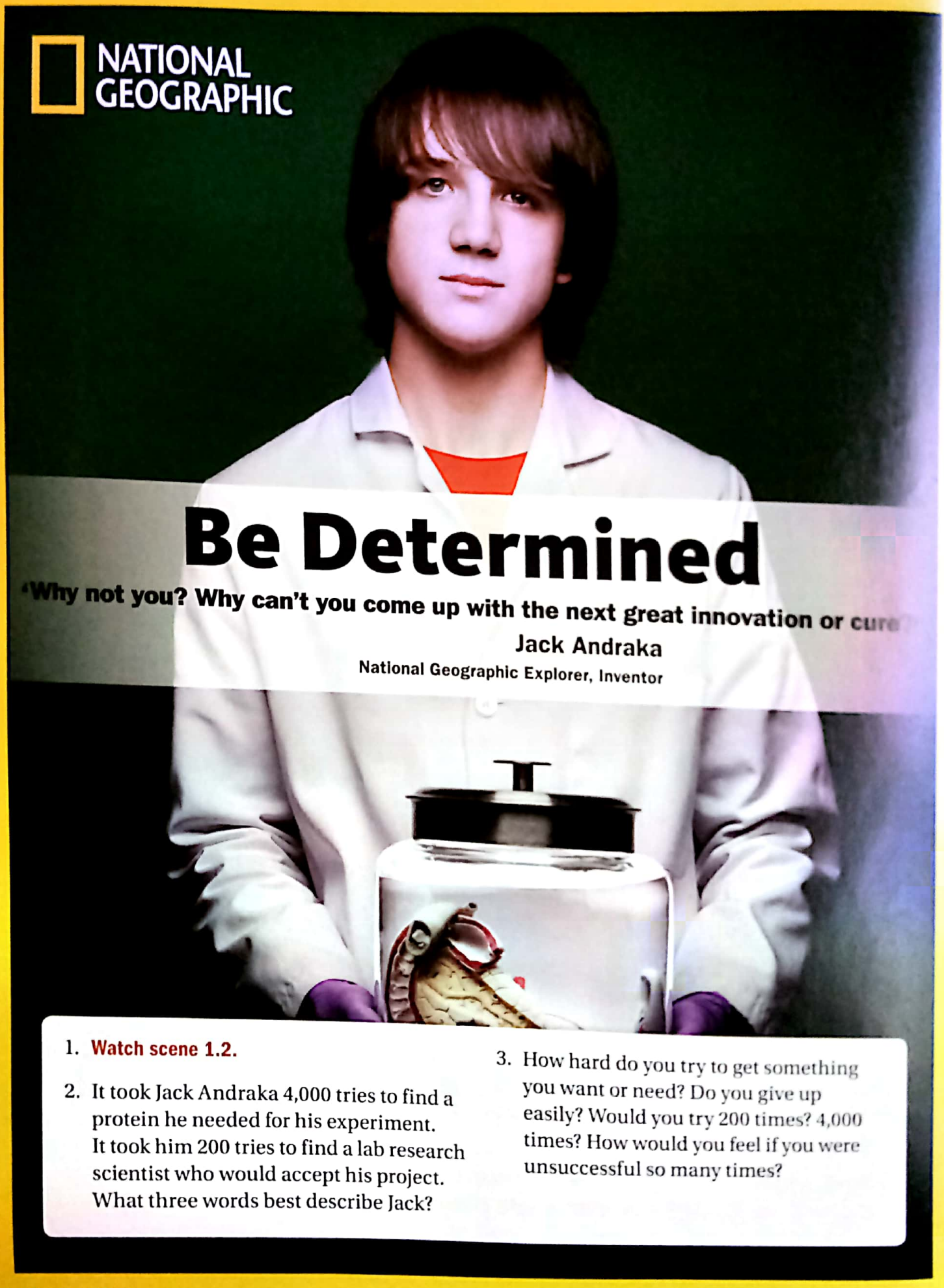
But it doesn't really matter to me what we do together. I like being with my grandfather and spending time with him. We're a good fit!



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

3 **Write.** Compare and contrast your personality with that of a family member.

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Be Determined

"Why not you? Why can't you come up with the next great innovation or cure

Jack Andraka

National Geographic Explorer, Inventor

1. **Watch scene 1.2.**
2. It took Jack Andraka 4,000 tries to find a protein he needed for his experiment. It took him 200 tries to find a lab research scientist who would accept his project. What three words best describe Jack?
3. How hard do you try to get something you want or need? Do you give up easily? Would you try 200 times? 4,000 times? How would you feel if you were unsuccessful so many times?

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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.

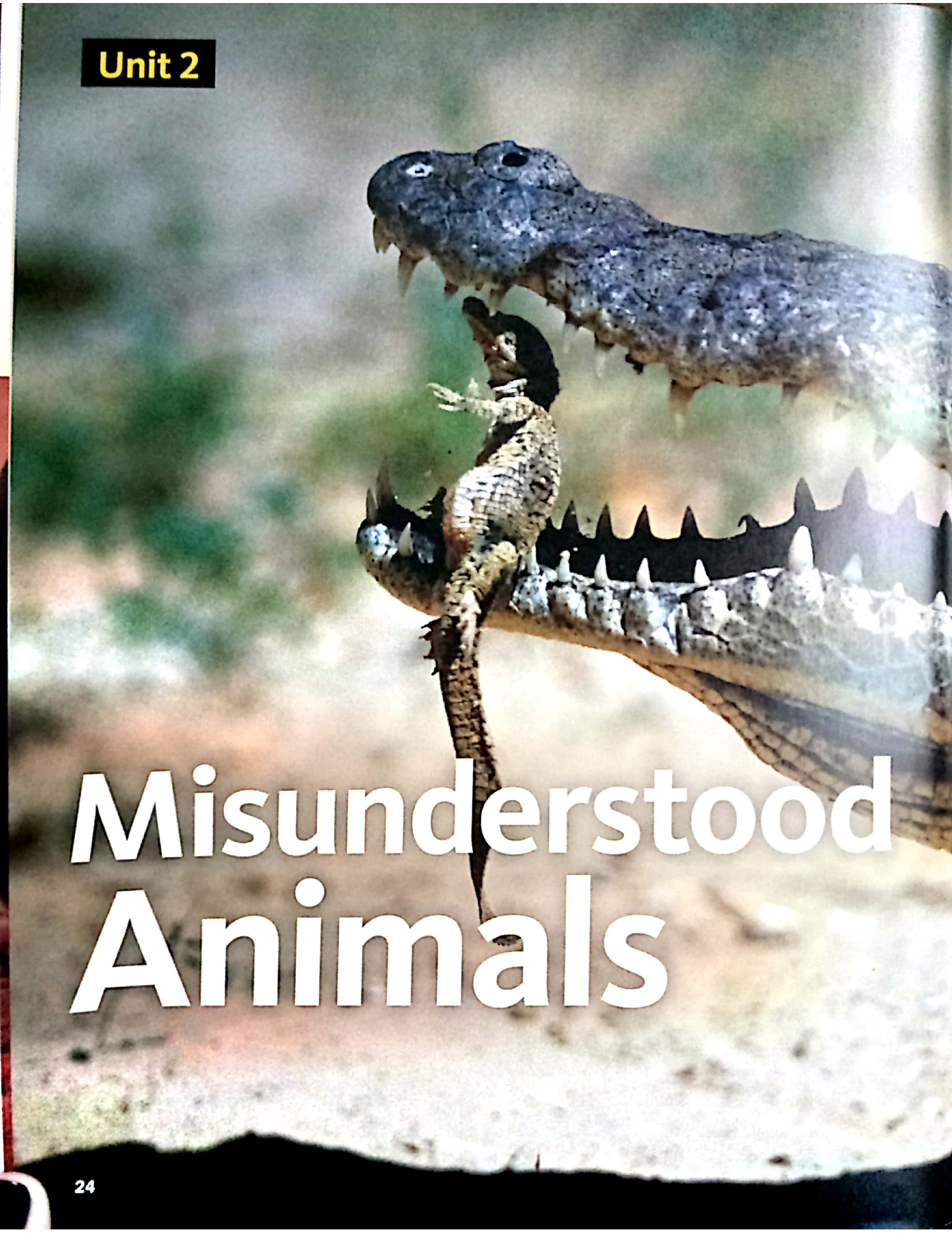
- Search the Internet for information on your topic.
- Write your report.
- Present your research to the class.

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.



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TO START

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?

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1 **Why do we care about some animals but not others?** Discuss. Then listen and read. 018

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

Cockroaches

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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?

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A Siamese crocodile

4 **Read and write the words from the list.**

beneficial	crucial	destroy	disgusting
ecosystem	poisonous	slimy	sting

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.** Then listen and repeat. 018 019

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.**

1. **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.
2. **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.
3. **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

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SPEAKING STRATEGY 020

Expressing surprise	Expressing disbelief
Wow! Really?	Oh, come on! You can't be serious.
That's amazing!	That's hard to believe.
No way! You're joking!	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.



Go to page 157.

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** the neighbour's dogs fighting.
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. _____

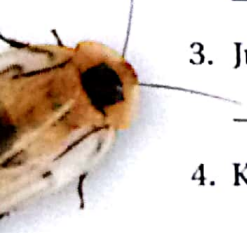
4. _____ 5. _____ 6. _____

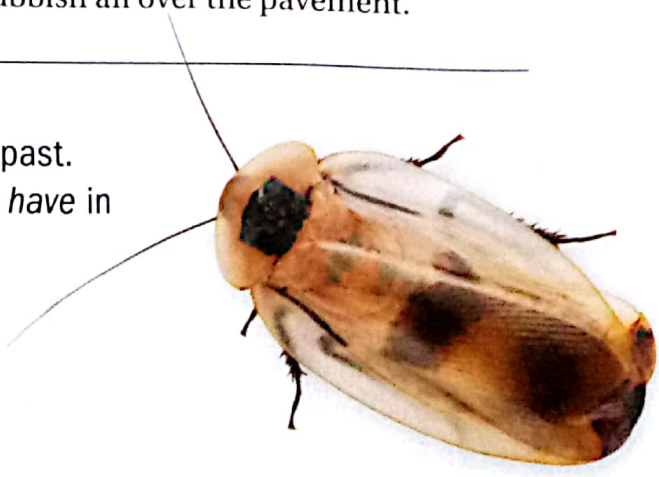
2 **Read and write.** For each item, write a sentence speculating about the past. Use *could have*, *may have*, *might have* and *must have* in your sentences.

1. Alice went into the kitchen for a midnight snack. She turned on the light and screamed. _____
2. Don kept scratching his arms and legs all night. _____
3. Julia heard something running inside the walls. _____
4. 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.

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







Caribbean giant cockroaches

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

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.



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.

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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.

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

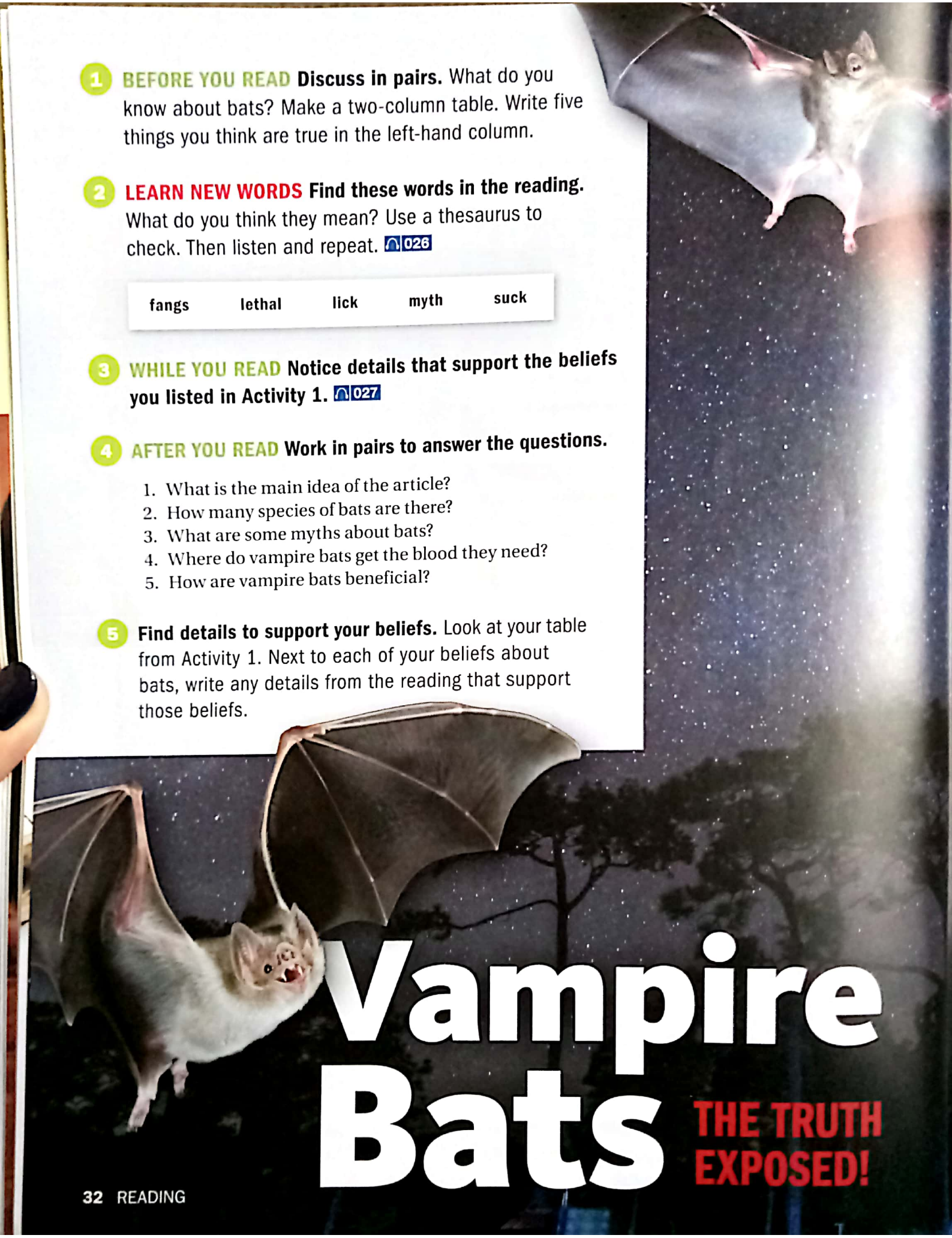
fangs	lethal	lick	myth	suck

3 **WHILE YOU 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 myths 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.



Vampire Bats

THE TRUTH EXPOSED!

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ARE HUMANS RIGHT TO FEAR ALL THINGS VAMPIRE?

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 myths, or false stories, about bats. One myth is that bats are flying mice. Another is that bats are blind, and so they can get caught in your hair. But the most popular myth, by far, is the one that connects vampire bats and the scary, fictional creatures known as vampires.

In novels, films and television programmes, fictional vampires use their sharp fangs to bite people in the neck and then suck their blood. Real vampire bats do have fangs. They use them 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.

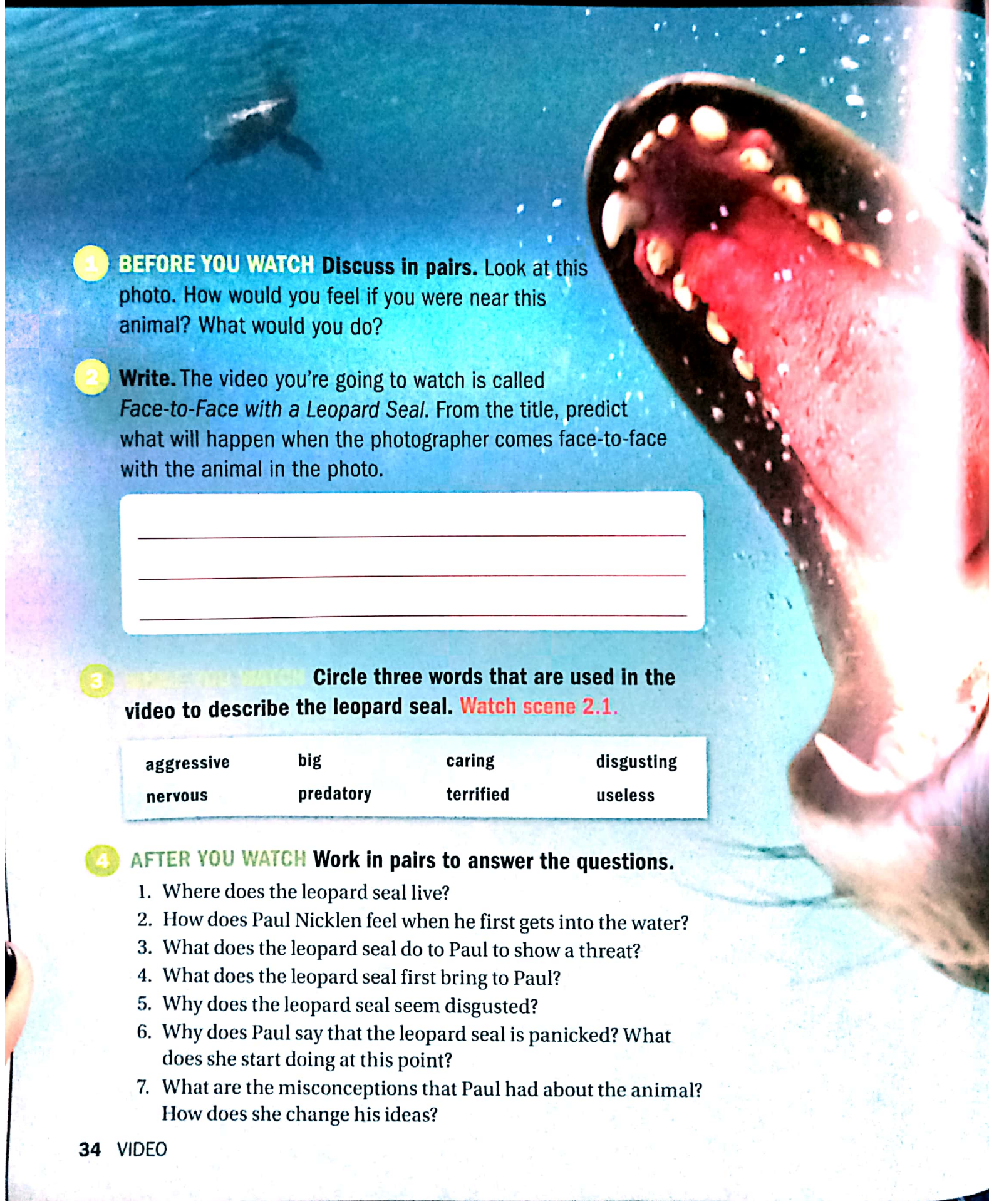
In addition, vampire bats are a valuable source of information for medical research. While they're drinking blood, these bats release substances that help blood keep flowing as they drink. Scientists are studying vampire bats to see if they can develop medications that work in the same way. Their research 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. Why do you think people like the idea of vampires so much? Do you have a favourite vampire character? Who is it? Why is this particular vampire your favourite?

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VIDEO



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.

_____

_____

_____

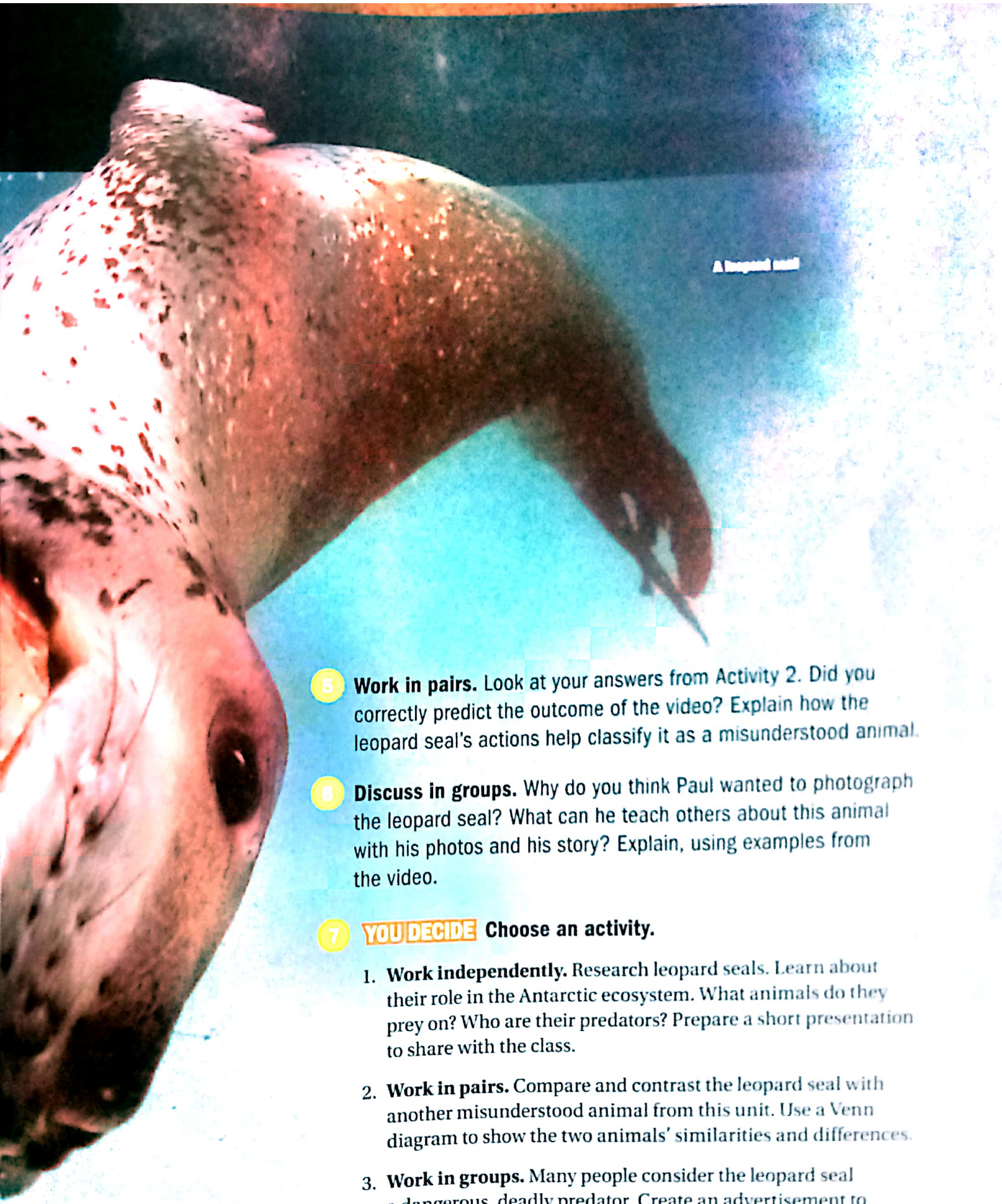
3 Circle three words that are used in the video to describe the leopard seal. Watch scene 2.1.

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?

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A leopard seal

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.**

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.

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GRAMMAR 028

Infinitives with and without *to*

To hold a rat is scary!
He doesn't want **to hold** rats.
She's excited **to hold** one.
That's the rat **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.



A rat

1 Read. Circle the correct letter.

1. My brother really wants _____ get a pet rat.
   a. ⊘ b. to
2. My mother will absolutely not let him _____ buy one.
   a. ⊘ b. to
3. He's planning _____ save money for one anyway.
   a. ⊘ b. to
4. I can't wait _____ see what happens when Mum finds out.
   a. ⊘ b. to
5. She'll make him _____ take it back to the shop.
   a. ⊘ b. to
6. I really want _____ see him get in trouble instead of me!
   a. ⊘ 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

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WRITING

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

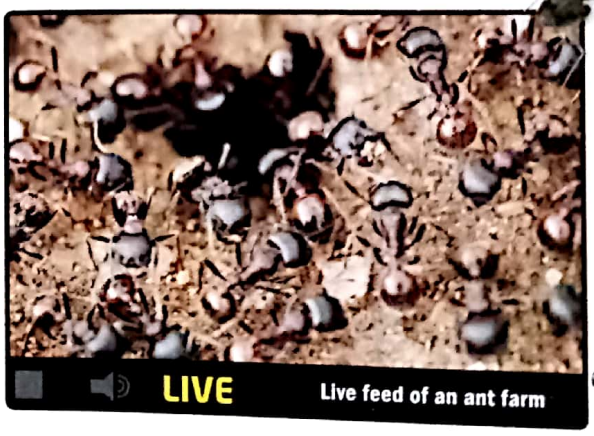
Purpose:	**in order to**	**so that**		
Sequence:	**before**	**during**	**after**	**finally**
	first	**then**	**next**	**while**
	little by little	**meanwhile**	**over time**	

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.

When you're very, very afraid of something, that fear can affect you and how you live your life. 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. I wouldn't eat outside, and I didn't even like playing outside. I checked my bed for ants every night. But when I turned 13, I decided I couldn't let my fear get to me. I had to learn to control my fear of ants.

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, I went outside one day and let an ant crawl onto my hand. It was OK! Now that I know about all the good things ants do, I'm not so afraid of them any more.



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 pit bulls. Imagine you have a new pit bull puppy. You don't want it to be misunderstood. How will you train it to be a good dog? Describe the process. How could you help people to understand your dog better?

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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

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?

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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.



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Express Yourself

1 **Read and listen to the story.** 029

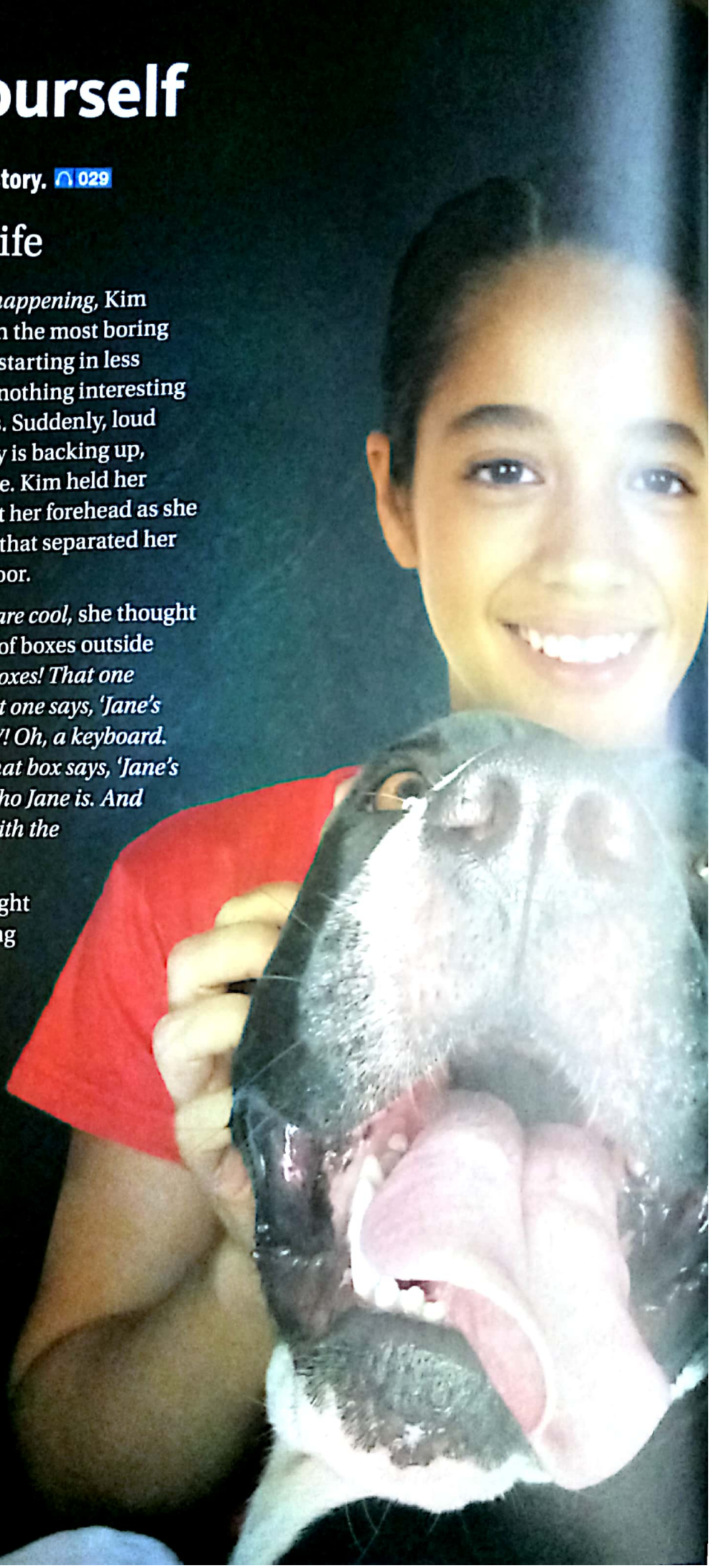
A Day in the Life

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 is 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.'



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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 and was happily licking Kim's hand that she looked up.

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

'I'm Kim,' she said. 'Nice to meet you. Welcome to the neighbourhood.'

They'd barely started talking 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.'

Well, 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.

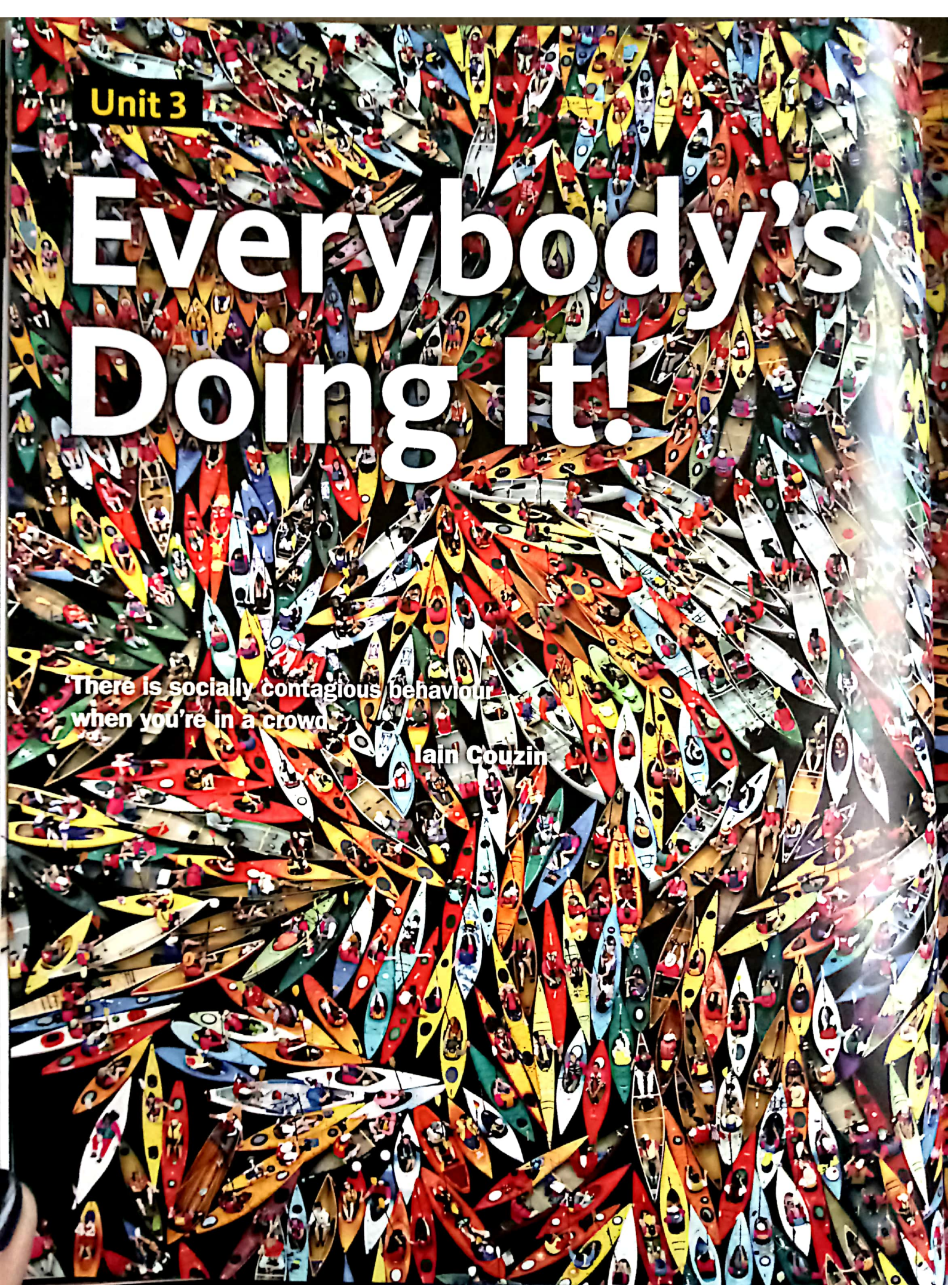
1. What happens in the story?
2. What are some of the misconceptions in the story?
3. Kim's mum probably embarrassed her in front of Jane. Why are teens sometimes embarrassed by their parents? Do the parents know they're doing it? Explain.

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.**

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.

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A group of nearly 2,000 kayaks and canoes

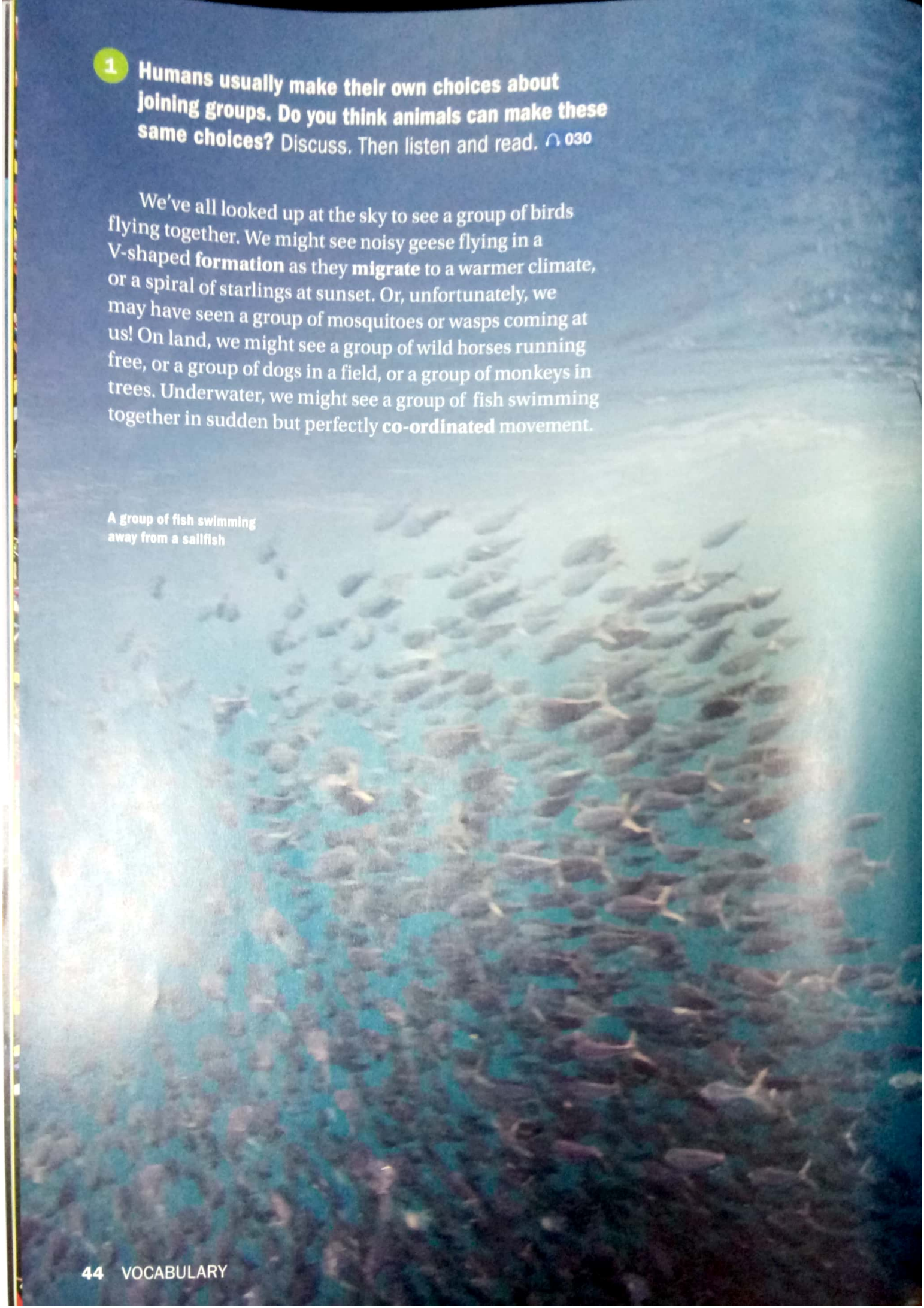
TO START

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.

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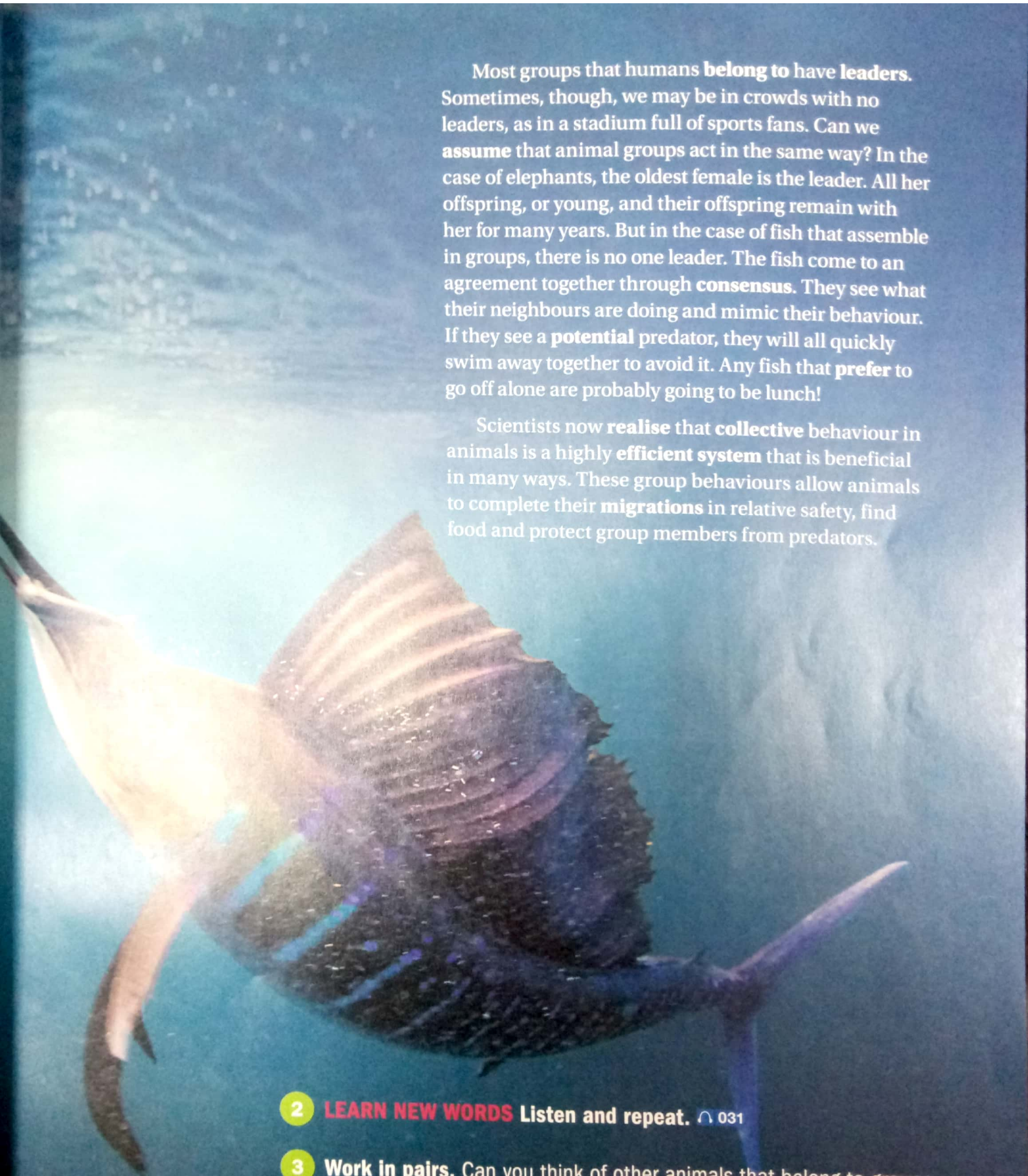
1 **Humans usually make their own choices about joining groups. Do you think animals can make these same choices?** Discuss. Then listen and read. 030

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 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

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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 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. 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 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.

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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.** Then listen and repeat. 032 033

assemble	crowd	mimic	remain

_____ 1. group

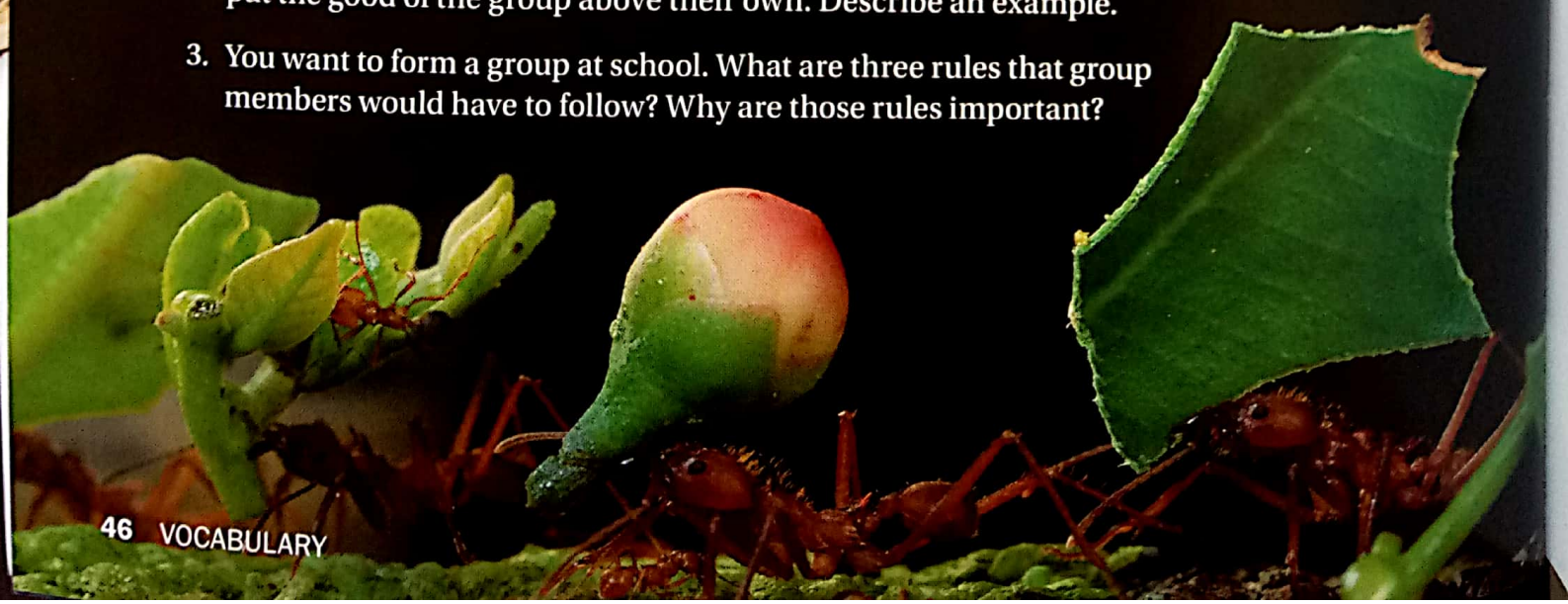
_____ 2. stay

_____ 3. imitate

_____ 4. come together

6 **YOU DECIDE** **Choose an activity. Work in pairs.**

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



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SPEAKING STRATEGY 034

Expressing cause	Expressing effect
Since she's scared of wasps, we stayed inside.	She's scared of wasps, so we stayed inside.
Because of the lack of food, the animals had to travel further and further away.	There was a lack of food. As a result, the animals had to travel further and further away.
The experiment was called off due to the poor weather conditions.	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 159.

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GRAMMAR 036

Phrasal verbs

Separable

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.**

Inseparable

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.



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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. Then listen and repeat. 037 038



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 44. 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**

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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.

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

flash mob	influence	intention	join	stand out

3 WHILE YOU 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 flash mob in Bucharest, Romania

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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.

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.

Not all short-lived groups deal with accidents or disasters. A flash mob, which is a group of people who suddenly assemble to perform in public, only comes together for a short time and then disappears. The goal of a flash mob is to do something surprising and entertaining in public, such as having a pillow fight or dancing in the street.

Whether we're fighting with pillows or helping people, 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 be in a flash mob? What would you want the flash mob to do?

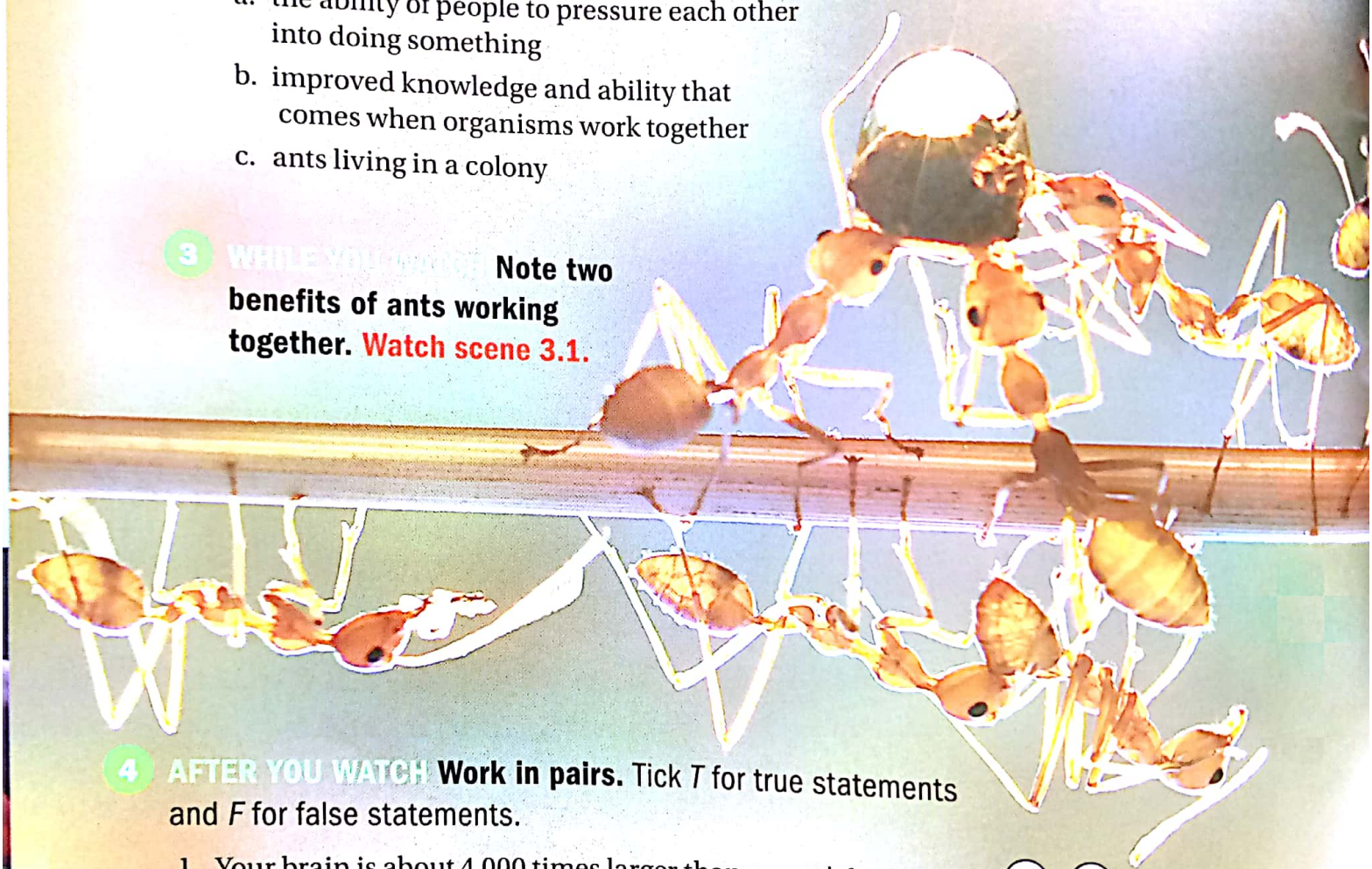
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VIDEO

1 **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 statements and *F* for false statements.

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)

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

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.

7 YOU DECIDE **Choose an activity.**

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.

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GRAMMAR 042

***Enough, too many, too much*: Talking about amounts**

I've got **enough** pillows, but there are **not enough** feathers. I need more.
You've put **too many** in each pillow. We've run out of feathers.
Do you want to join the flash mob pillow fight?
No way. All those people and feathers, too? It's **too much** stress for me.

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 flash mob later? Right now, we haven't got _____ people participating.

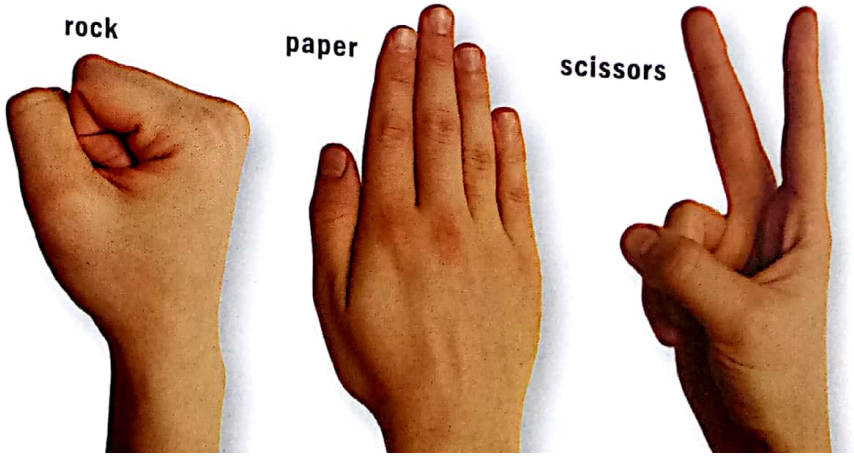
Juan: No, thanks. I've got _____ things to do this afternoon.

Carlos: You haven't got _____ time to see Gloria? She'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**
	pillows



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WRITING

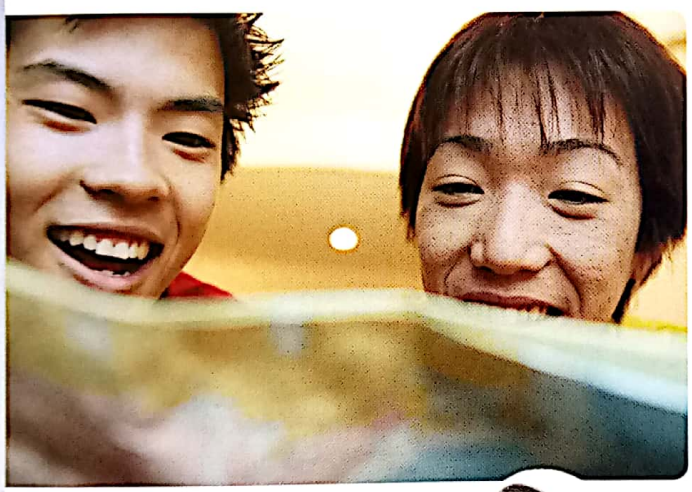
In writing, using good examples is one way to explain and support the main idea. We can introduce examples with phrases such as:

for example **for instance** **in other words** **such as**

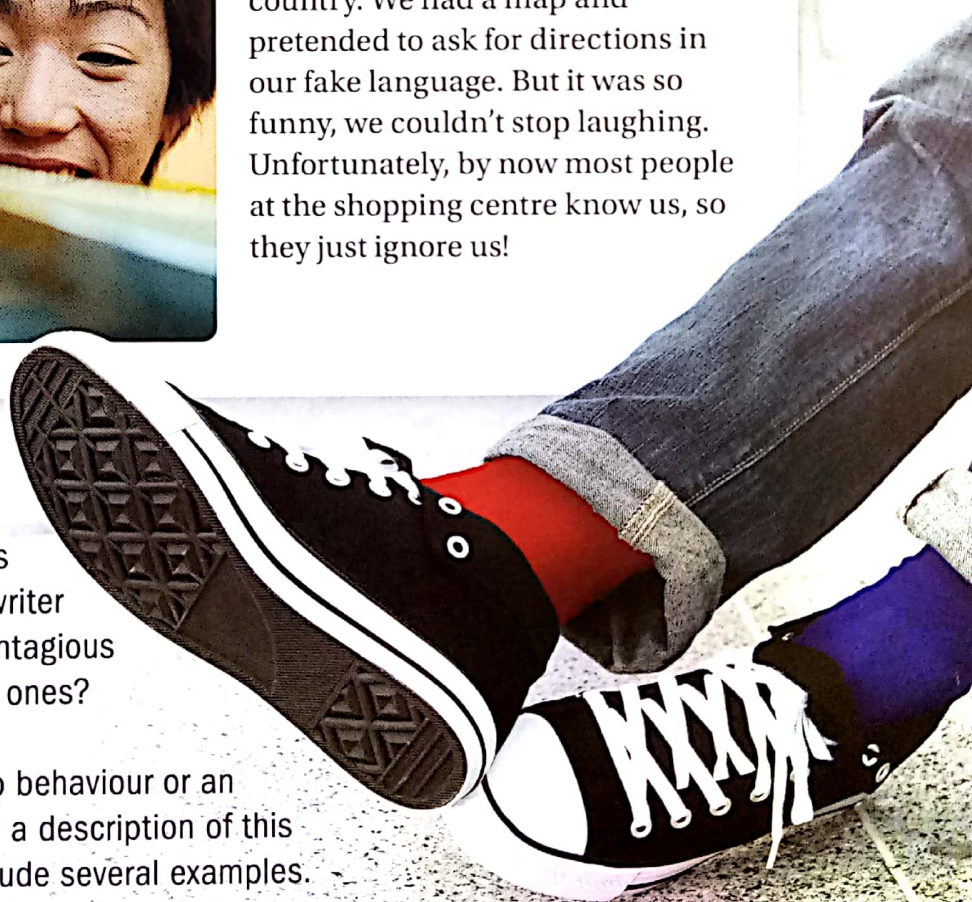
1 **Read the model.** Work in pairs to identify the parts of the writing. How does the writer introduce examples? Underline the phrases.

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.

But our favourite thing is going shopping on Saturdays. We like looking in the shops, but we have fun doing crazy things, too. In other words, we like to get people's attention. For example, we might all wear one blue sock and one red sock to see if anyone notices. Or we might pretend to look for a lost contact lens on the floor to see if someone else will start looking.



Once, we made up a foreign-sounding language and pretended that we were tourists from another country. We had a map and pretended to ask for directions in our fake language. But it was so funny, we couldn't stop laughing. Unfortunately, by now most people at the shopping centre know us, so they just ignore us!



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.** Choose a human group behaviour or an animal group behaviour. Write a description of this behaviour. Make sure you include several examples.

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NATIONAL GEOGRAPHIC

Collaborate

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

Iain Couzin

National Geographic Explorer, Behavioural Ecologist



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.

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Make an Impact

YOU DECIDE **Choose a project.**

1 Plan and carry out a flash mob activity.

- Choose an activity to carry out as a flash mob.
- Notify people on social media about the time and place of your flash mob.
- Film your flash mob and present it to the class.

2 Plan and make a video of human group behaviour.

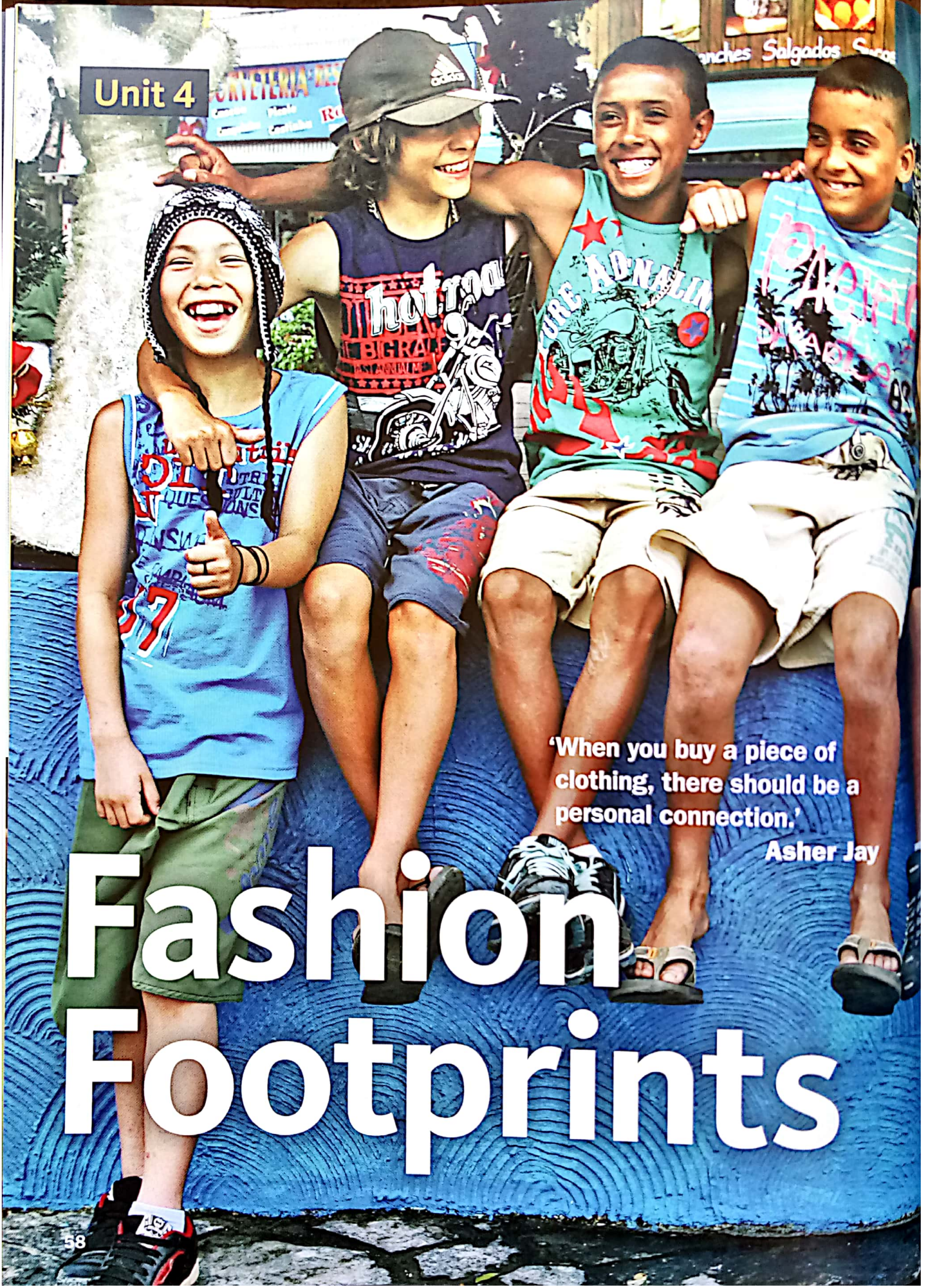
- With a group, go to a crowded place. Pretend to look for something on the floor, such as a contact lens.
- One group member should film what happens for two or three minutes. Take notes on any contagious behaviour.
- Write the results of your experiment, and present them to the class.

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.

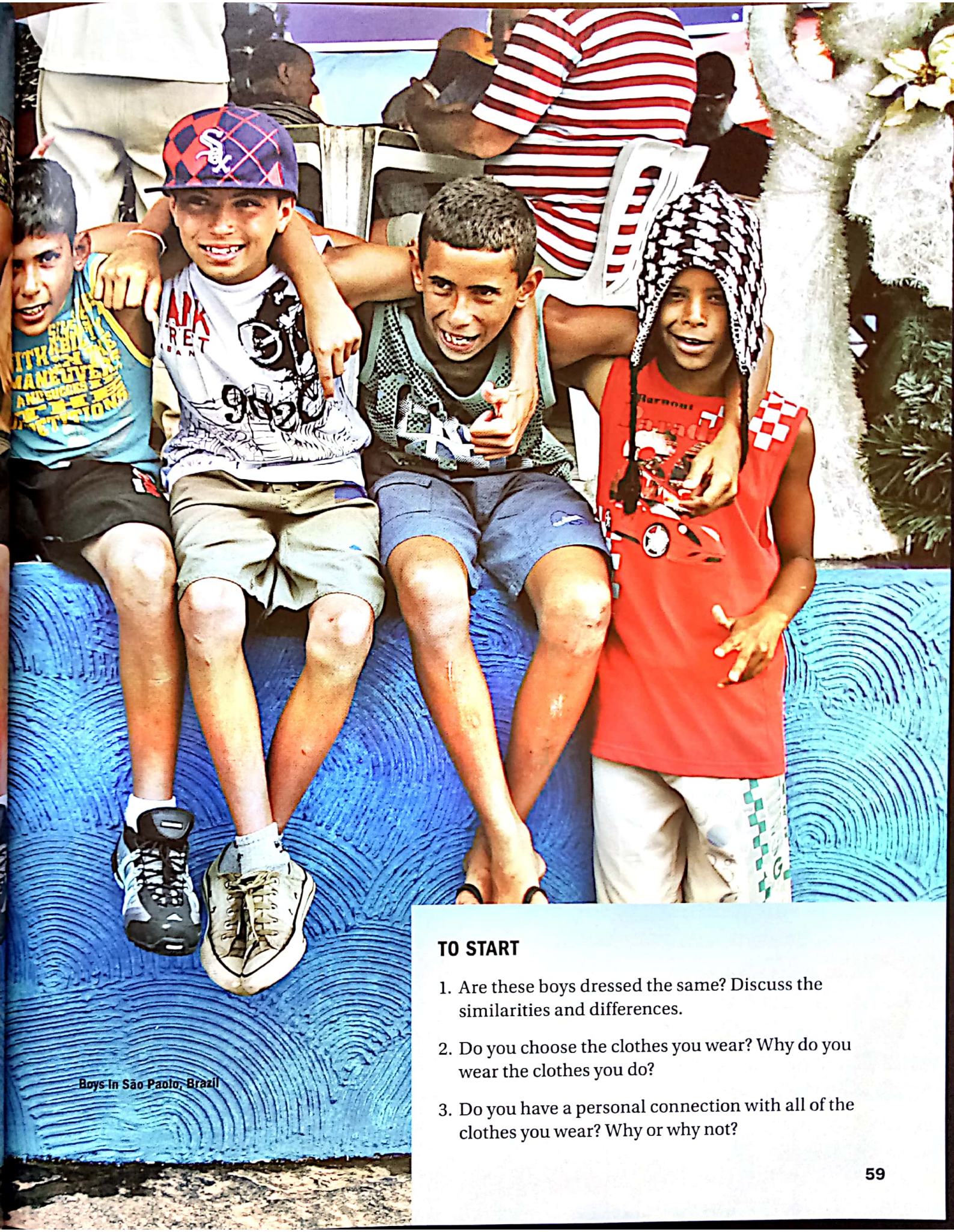


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Fashion Footprints

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Boys in São Paolo, Brazil

TO START

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

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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.

And finally we make our clothing choices for social reasons, such as showing we want to **fit in** with a group, or making a statement about our beliefs.

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.



These Japanese teens show off their accessories in Harajuku Square.

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Cotton uses more pesticides than any **crop** in the world.

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?

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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.** Then listen and repeat. 046 047

attractive	popular	psychological	social

_____ 1. mental

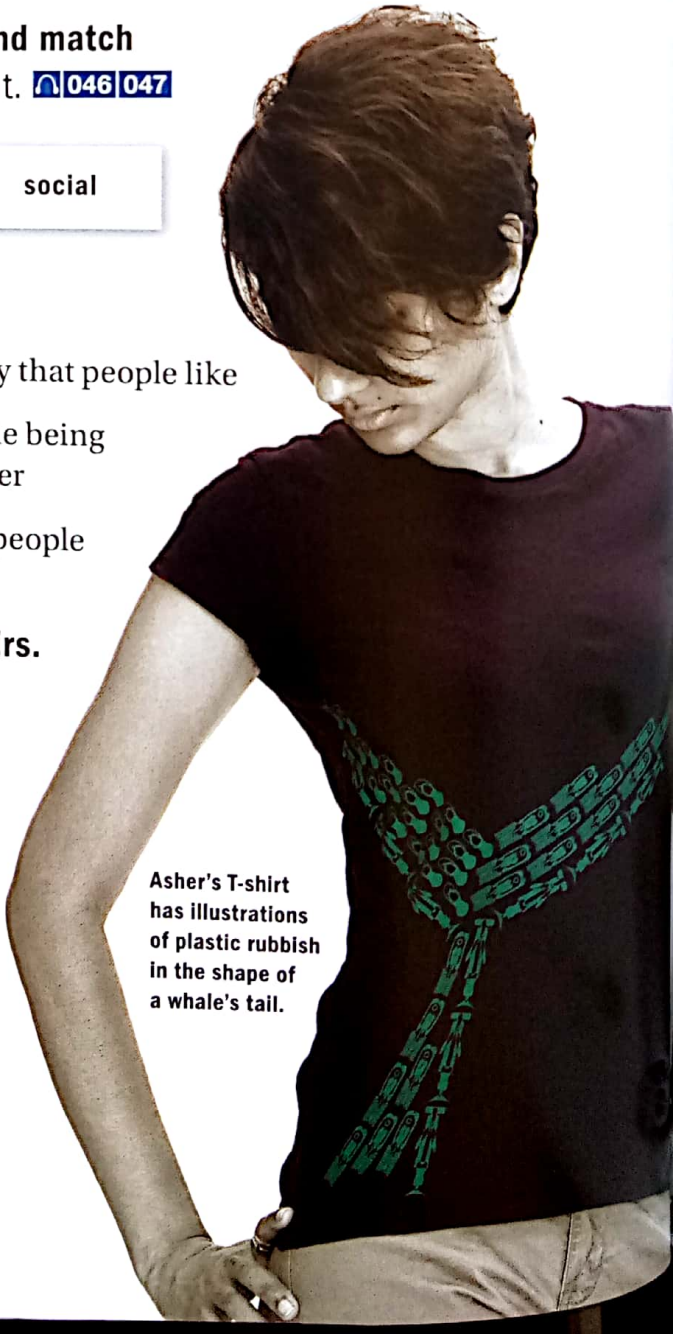
_____ 2. having a quality that people like

_____ 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? Is it better to fit in or to stand out? Why?
3. Do a video interview. Ask your classmates about their favourite outfits and why they like them.



Asher's T-shirt has illustrations of plastic rubbish in the shape of a whale's tail.

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SPEAKING STRATEGY 048

Asking for clarification	Clarifying
When you say _____, what do you mean?	What I meant was _____.
Are you saying that _____?	That's right./No, that's not it. I meant _____.
Could you explain that a little more?	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 155.



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?

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GRAMMAR 050

Present passive: Describing actions and processes

They use a lot of pesticides to grow cotton.
They make a lot of clothing from synthetic materials.

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

450 million pairs of jeans are sold annually in the U.S.

9,982 litres (2,900 gallons) of water are needed to produce one pair of jeans.

The average American woman owns 8 pairs of jeans.

20,000 tons of indigo dye are produced every year for colouring jeans.

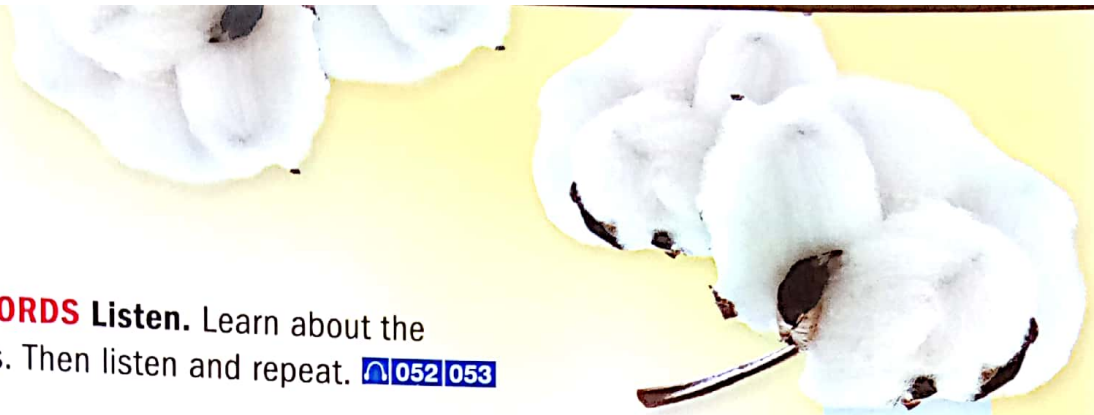
More than 50% of jeans are made in Asia.

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.

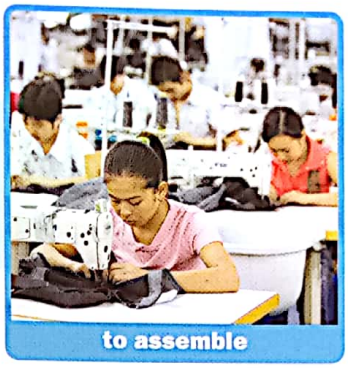
Jeans are made with a material called denim.

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


to ship

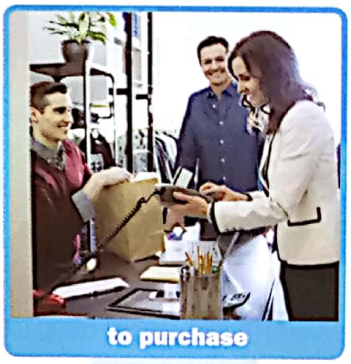

to assemble


factory


warehouse



retailer


to 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.

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

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 **Look for similarities and differences.** 055

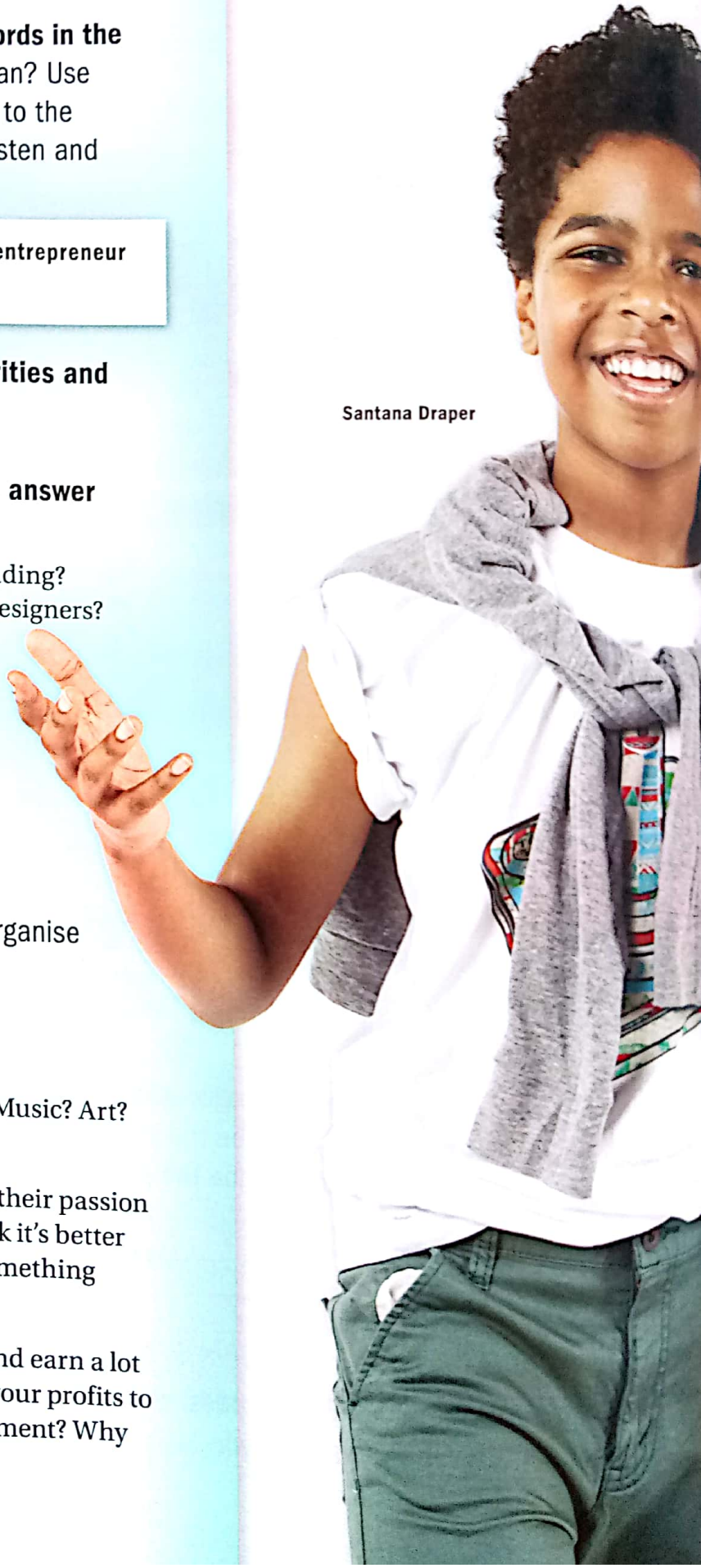
4 AFTER YOU READ **Work in pairs to answer the questions.**

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

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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.



Maya Penn

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VIDEO



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.

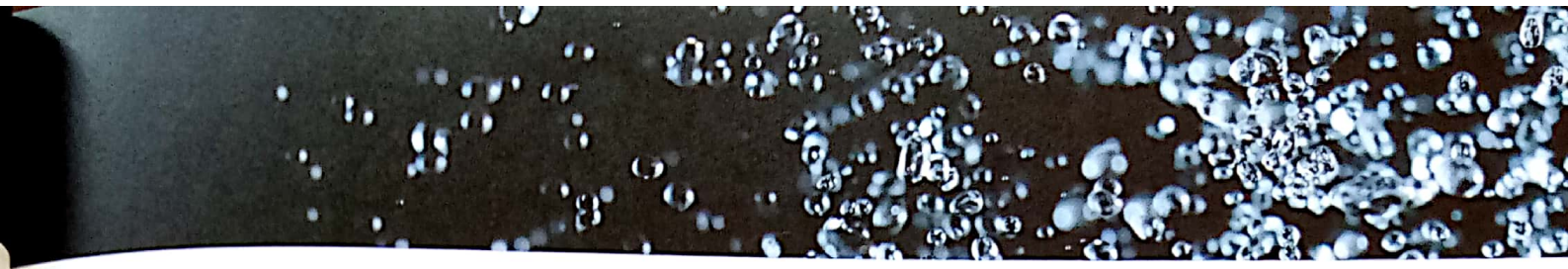
1 Cotton is everywhere.

_____ 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.

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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?

1 Buy used clothes from second-hand clothes shops.

2 Have a 'swap party'. Exchange clothes with friends.

3 Learn to sew and repair clothes. Don't throw clothes away.

4 Donate used clothes.

5 Buy clothing from companies that are eco-friendly.

7 **YOU DECIDE** **Choose an activity.**

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?

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GRAMMAR 056

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 thowing a coin (heads = 1 space; tails = 2 spaces). Make suggestions and give advice about present and past actions as instructed.



Go to page 161.

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WRITING

In persuasive writing, we can support our point of view with facts and statistics. We use phrases such as:

_____ states that

according to _____

the facts show that _____

research shows that _____

1 **Read the model.** Work in pairs to identify the parts of the writing. How does the writer persuade the reader? Underline the phrases.

Have you ever seen someone wearing fur? Some people think fur is a fashion statement. Other people think it is more important to stop killing animals.

Research shows that millions of animals are killed for their fur each year. Some are hunted and trapped in the wild. Even more die at what are called fur-factory farms. According to groups that protect animals, most of the skins that people buy come from fur farms. On these farms, animals live in small, dirty cages until it's their turn to die.

People in the fur business say they help control animal populations. But the facts show that animals control their own populations. Fur factories also claim they do not have an impact on the environment, but that's not true, either. A real fur coat takes more than 20 times the energy needed to make a fake fur coat! The chemicals fur factories use also pollute the water.

Fashion lovers should know that every fur coat, jacket, waistcoat or hat represents animal suffering. This harm to animals and the environment will end only when people do their part and stop buying and wearing fur.



A mink

2 **Work in pairs.** Does the writing persuade you to do something about wearing fur? Why or why not?

3 **Write.** Persuade your readers to reduce their fashion footprint.

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Make Good Choices

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

Asher Jay

National Geographic Explorer, Creative Conservationist

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.

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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. **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.



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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.

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

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

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

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.

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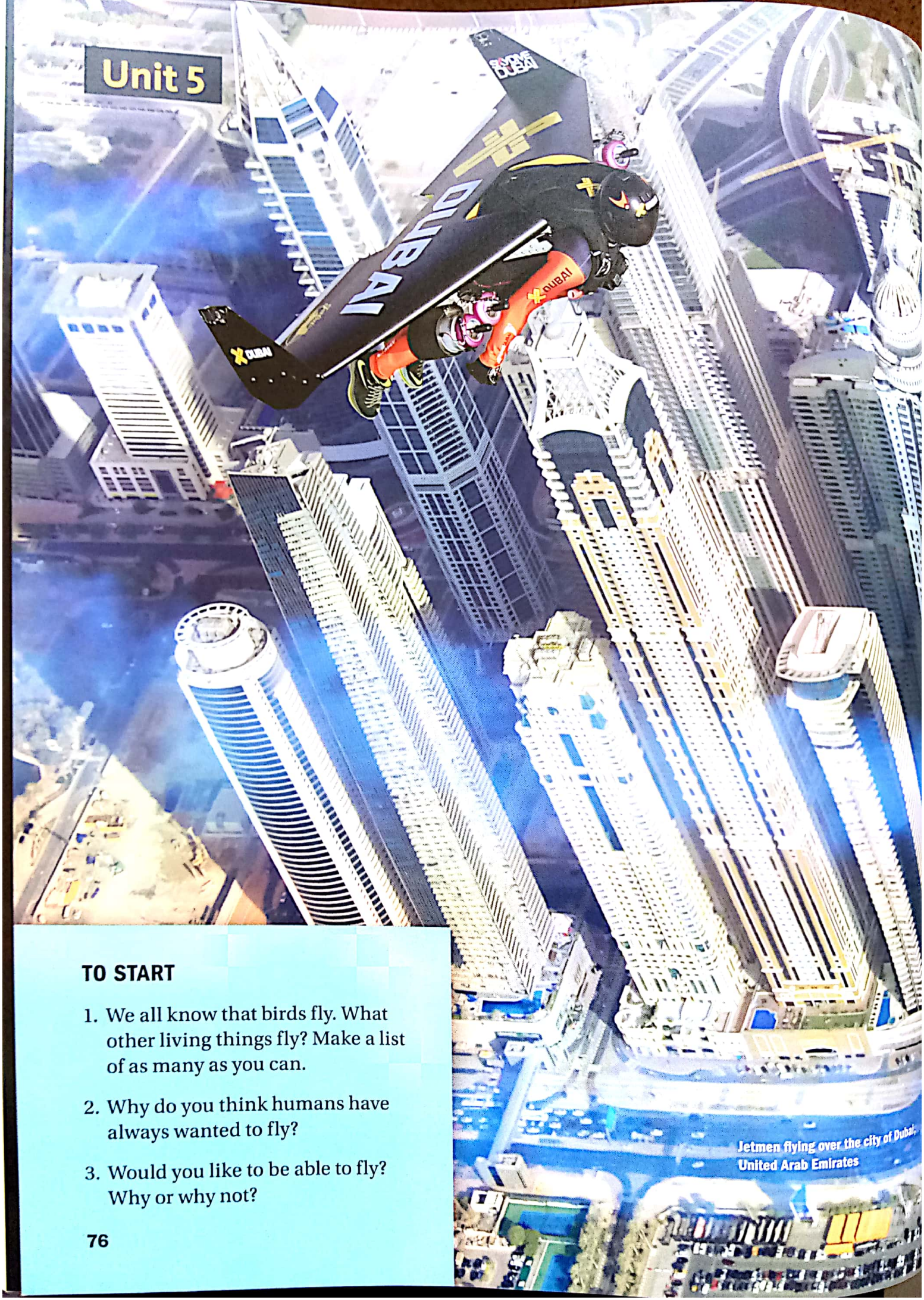
3 **Connect ideas.** In Unit 3, you learnt about group behaviours. In this unit, you learnt about fashion trends. What connection can you see between the two topics?

4 **YOU DECIDE** **Choose an activity.**

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 rap
   - a poster
   - a short video
3. Present your work.

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Unit 5



Jetmen flying over the city of Dubai, United Arab Emirates

TO START

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?

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

Ryan Carney

Flying High

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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.



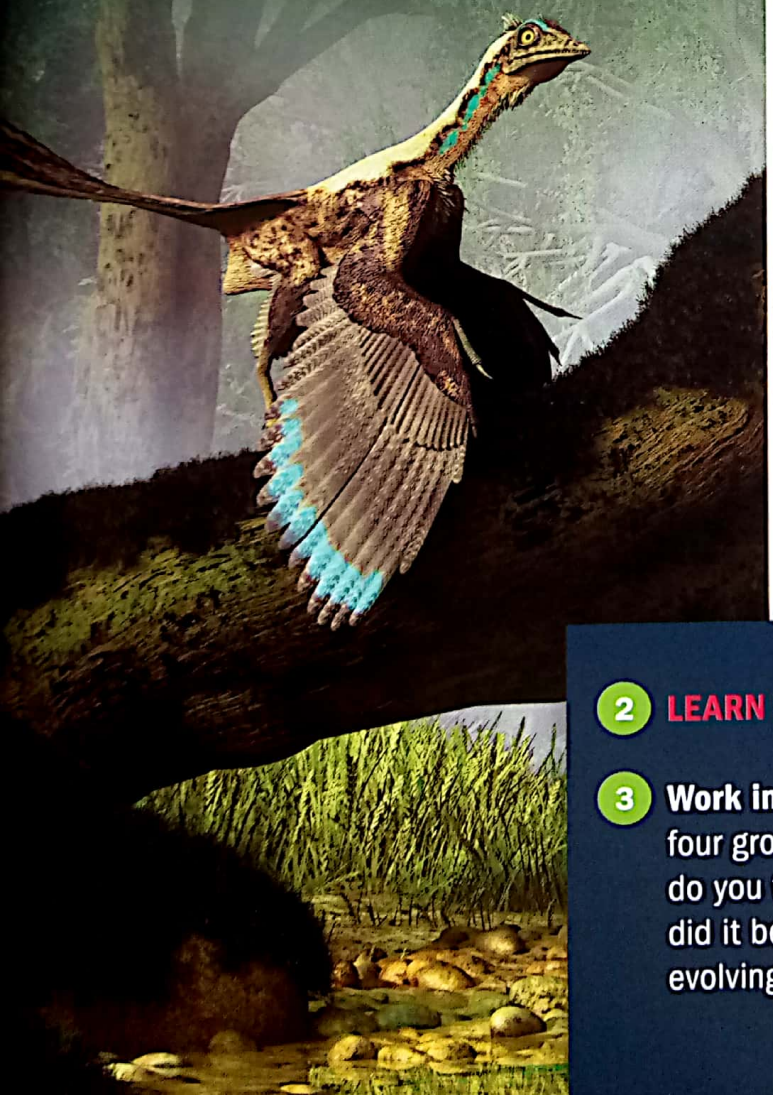
229 million years ago

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.)!

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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.

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

adaptation	capability	evolve	flight
glide	hollow	limited	weight



Archaeopteryx feather fossil

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).



Ryan Carney

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

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.**

1. 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?
2. 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?
3. Why do you think bats developed flight to use mainly at night? How are bats' flight adaptations different from those of other fliers?

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SPEAKING STRATEGY 062

Arguing	Conceding
I'm sure you agree that _____ .	I guess you have a point.
Well, I think that _____ .	Well, maybe you're right.
Most people support _____ .	
Yes, but what about _____ ?	



A colugo

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.

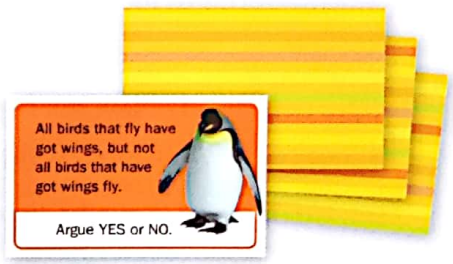
Alan: Maybe, but _____ the idea that bats are closely related to a group of mammals that also includes the colugo.

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.

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



Go to page 163.

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

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.

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GRAMMAR 064

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

Pterosaurs disappeared.
Modern birds evolved.

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

The capability of flight developed four times in animals.
Humans tried to fly.

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

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

1. ☐ kite flight ☐ animal flight
2. ☐ running, arm 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 Cordoba, 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.



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

4 **Read the sentences.** Tick T for *true* or F for *false*.

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

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

1. _____
2. _____
3. _____
4. _____



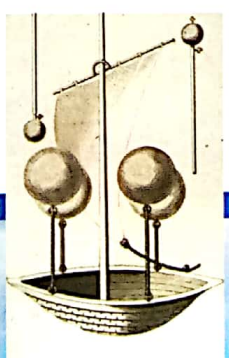
1485
Leonardo da Vinci studies **forces** that affect objects in the air in order to design flying machines.





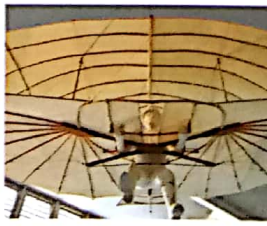
1595
Fausto Veranzio designs a **parachute**.

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.



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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?

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 to land pilot to take off

3 **WHILE YOU 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.



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

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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!

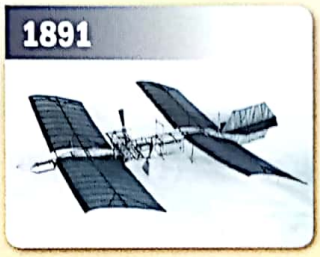
The second, third and fourth flights followed on the same day. But the Wright brothers observed that the Flyer was not stable enough and was hard to control. They spent two more years perfecting their aeroplane. Finally, on the 5th of October 1905, Flyer III flew about 39 km. (24 mi.) in 39 minutes.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

_____ 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.

1 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?

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VIDEO

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. _____



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

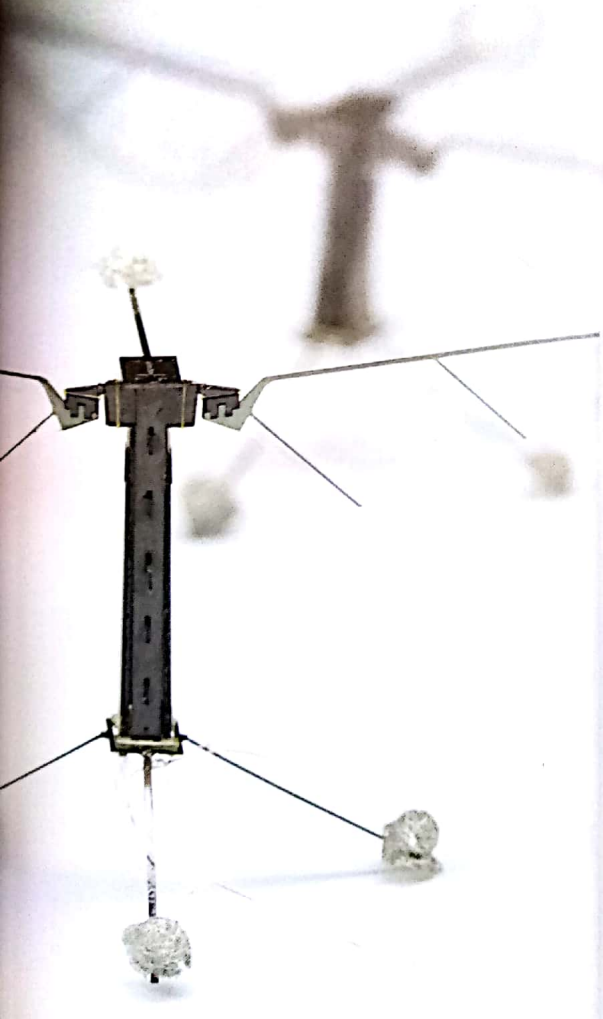
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4 AFTER YOU WATCH Work in pairs to decide if each sentence is *true* or *false*. Tick the correct answer.

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.

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.

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GRAMMAR 070

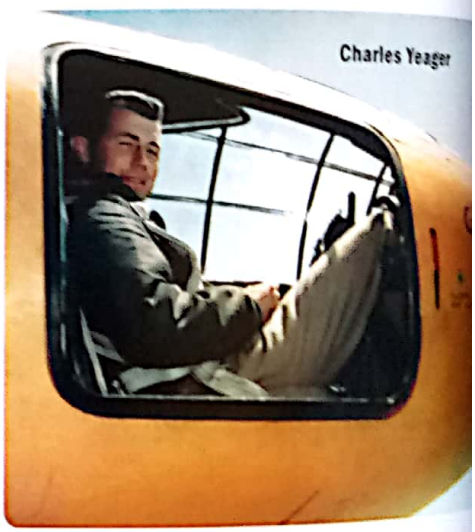
Past perfect continuous: Talking about the first of two actions in the past

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

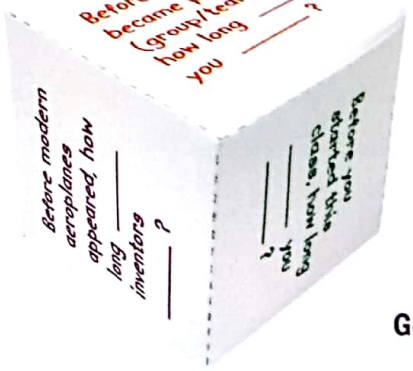
Before Louis Bleriot first crossed the English Channel in an aeroplane in 1909, pilots **had been using** hot-air balloons.

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 165.

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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.

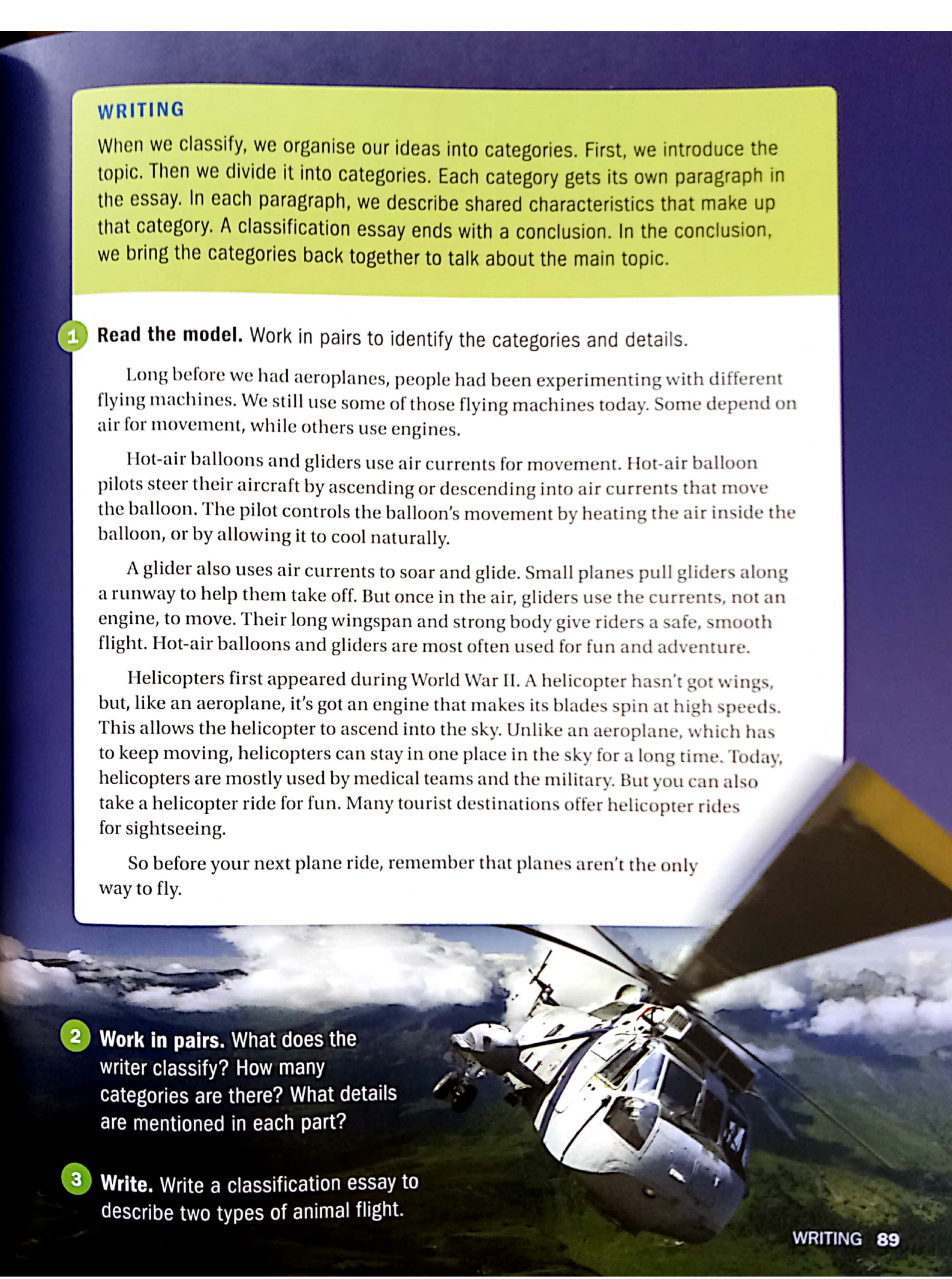
Long before we had aeroplanes, people had been experimenting with different flying machines. We still use some of those flying machines today. Some depend on air for movement, while others use engines.

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.

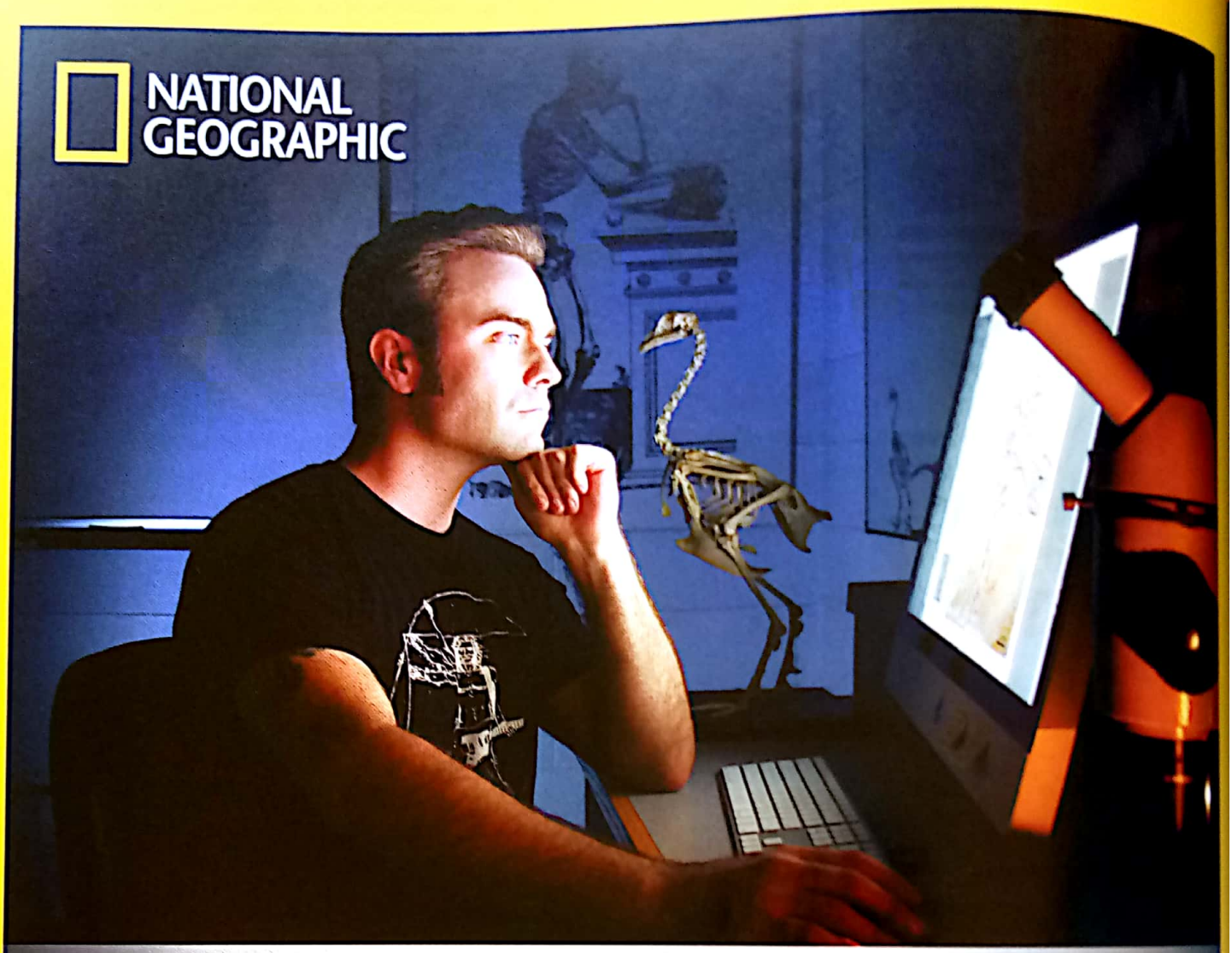
So before your next plane ride, remember that planes aren't the only way to fly.



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 to describe two types of animal flight.

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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

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 Leonardo da Vinci 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?

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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

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Unit 6

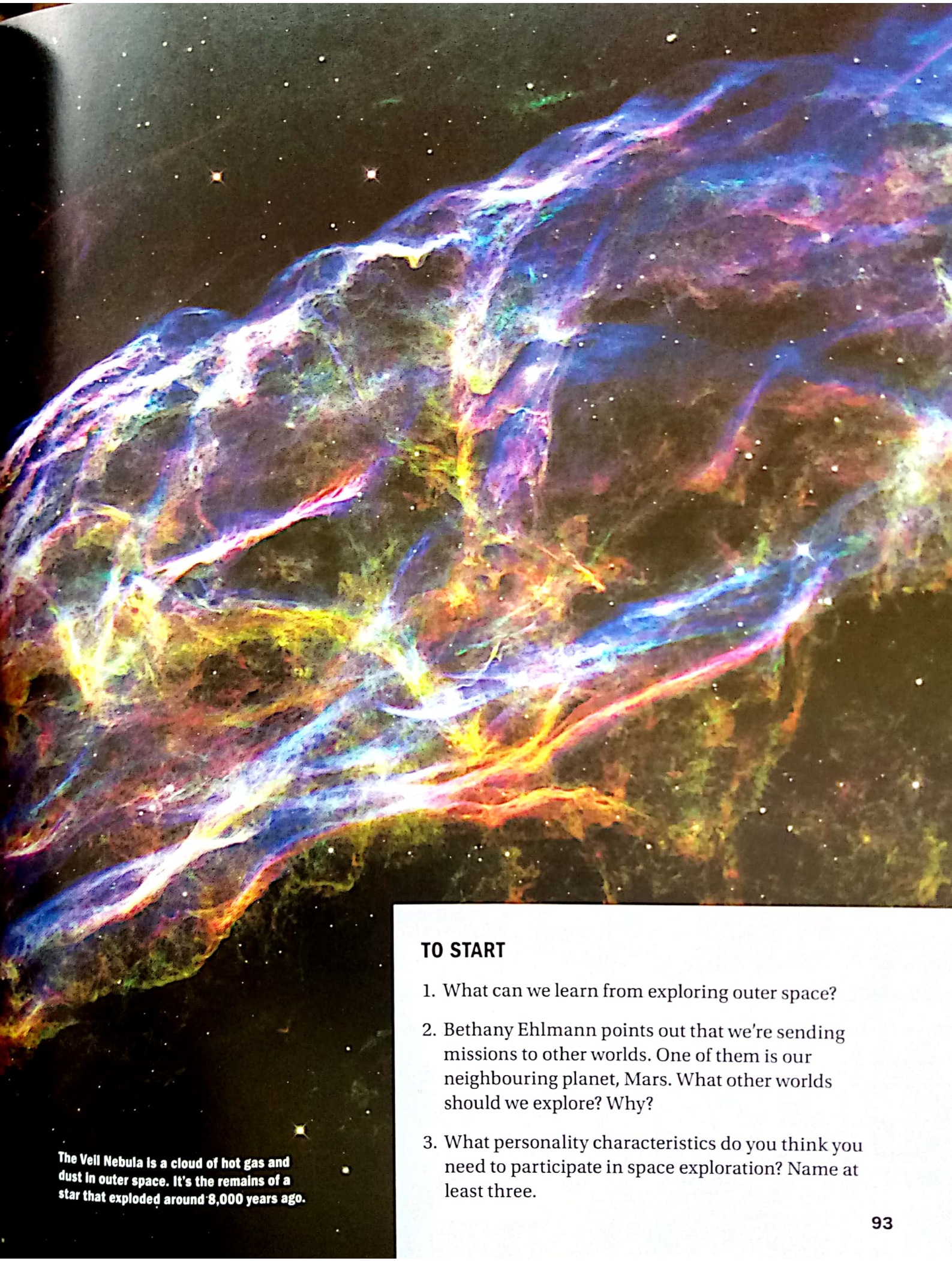
New Frontiers



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

Bethany Ehlmann

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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

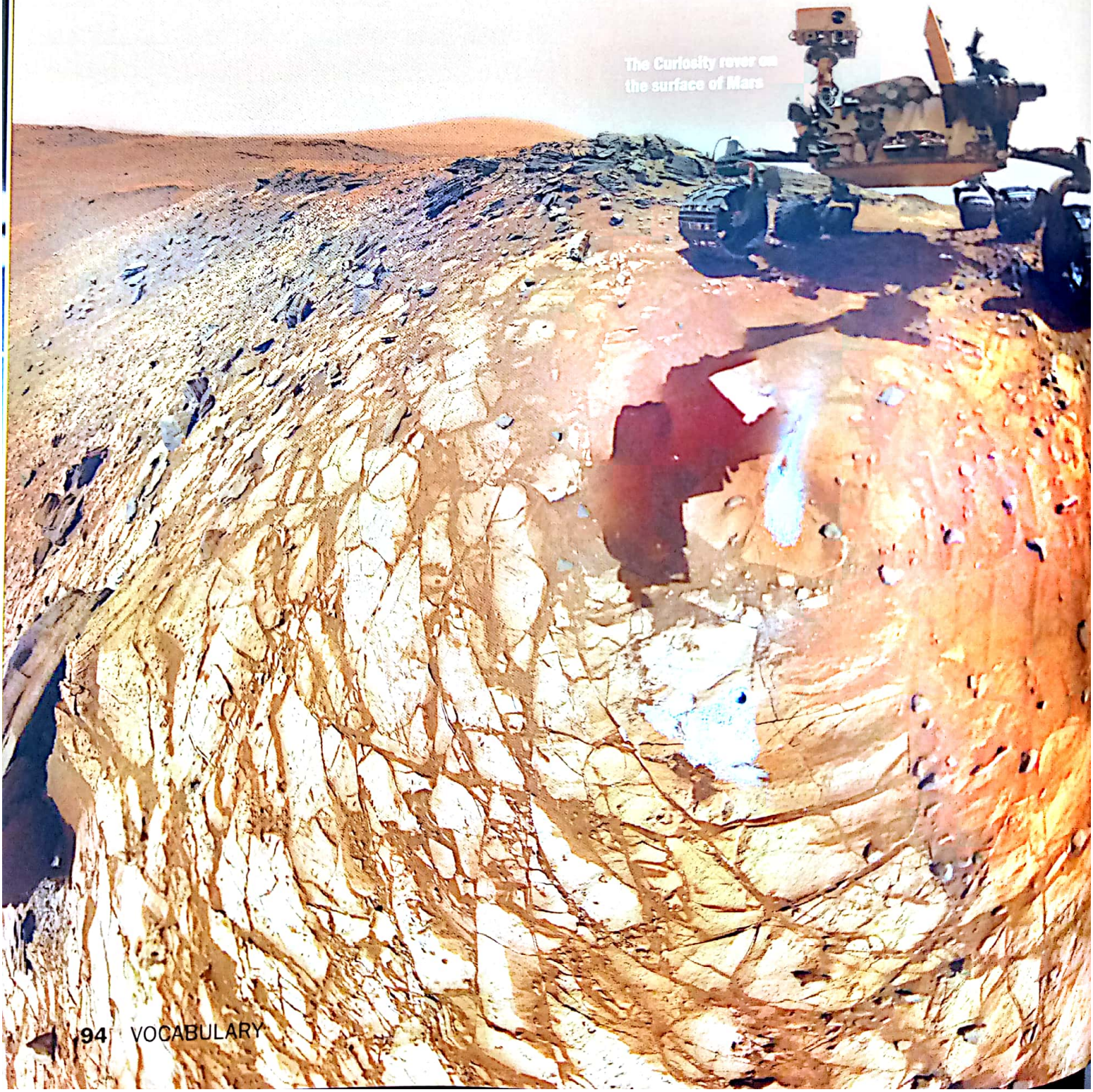
1. What can we learn from exploring outer space?
2. Bethany Ehlmann points out that we're sending missions to other worlds. One of them is our neighbouring planet, Mars. What other worlds should we explore? Why?
3. What personality characteristics do you think you need to participate in space exploration?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

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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

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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?

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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. Then listen and repeat. 073 074

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.

1. **Work independently.** Go online to learn more about the Curiosity rover's mission. Write a paragraph about what you learnt.
2. **Work in pairs.** Make a Venn diagram. Compare and contrast Earth and Mars.
3. **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.



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SPEAKING STRATEGY 075

Speculating

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

What if scientists really do find evidence of life?

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!

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.

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 167.

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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.

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

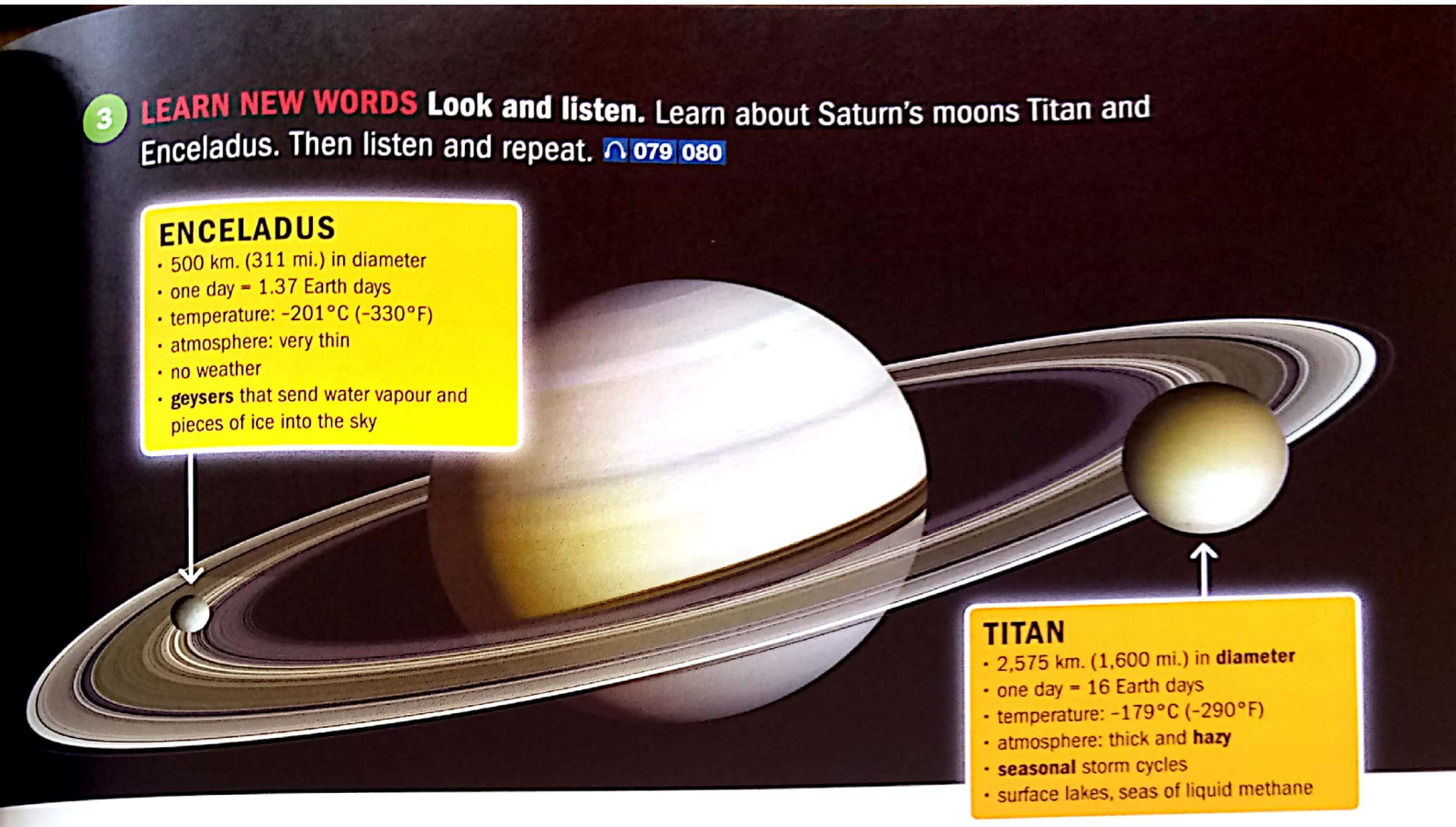
1.	☐ I'm not president.	☐ I'm president.
2.	☐ The project succeeded.	☐ The project failed.
3.	☐ I investigated Titan.	☐ I didn't investigate Titan.
4.	☐ There is one space station.	☐ There are two space stations.
5.	☐ We repeated the experiment.	☐ We didn't repeat the experiment.
6.	☐ I don't explore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

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



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.

1. If you _____ (have) the right equipment, you _____ (visit) Titan and be able to experience life on a moon.
2. If you _____ (come) to Titan while I was there, would you _____ (swim) with me in a surface lake?
3. If I _____ (know) you would be living on Titan, I _____ (remind) you about the seasonal storm cycles.
4. If I _____ (be) on Titan today, I _____ (try) to take photographs of the storms.
5. If Enceladus _____ (be) habitable by humans, I _____ (go) there next year.
6. 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.

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More Than a Dream

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?

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 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

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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?

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VIDEO

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.

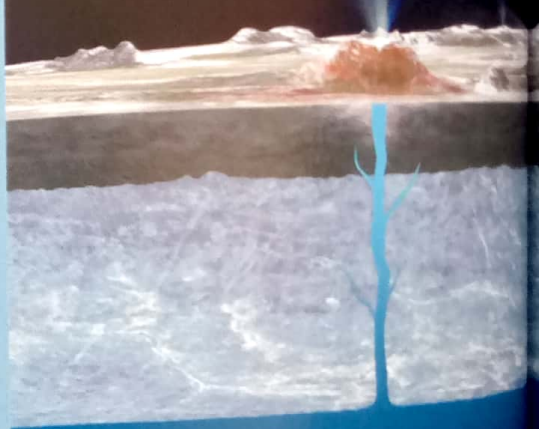
a. another world with an ocean
b. an ocean near Europe
c. a new world discovered by Europeans

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

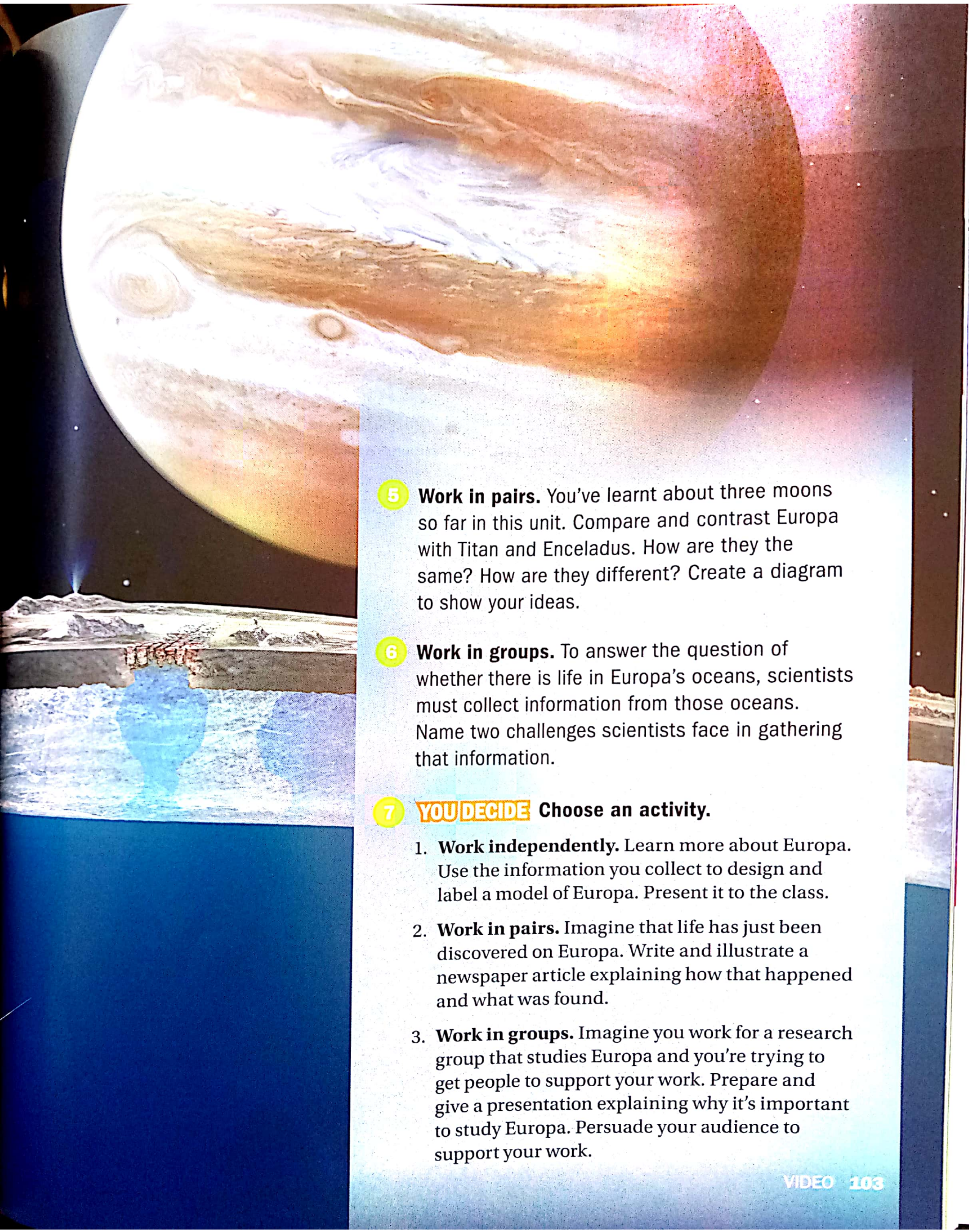
4 **AFTER YOU WATCH** **Work in pairs.** Circle the correct answer.

1. Kevin Hand says that life on Earth may have begun in our *oceans* / *caves*.
2. Where you find liquid *lava* / *water*, you generally find life.
3. Europa's ocean has existed for *ten thousand* / *billions of* years.
4. *Earth* / *Europa* has more water and deeper oceans.
5. Scientists used to think that for a world to be habitable, it had to be *the right distance from* / *in orbit around* the sun.
6. 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.

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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.**

1. **Work independently.** Learn more about Europa. Use the information you collect to design and label a model of Europa. Present it to the class.
2. **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.
3. **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.

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GRAMMAR 083

Adverbs: Comparing how things are done

The new satellite transmits data **efficiently**.

The last satellite didn't transmit data **as efficiently as** the new satellite.

The new satellite transmits data **more efficiently than** the last satellite.

The new satellite transmits data **the most efficiently** of all the satellites.

The new rover travels **fast**.

The last rover didn't travel **as fast as** the new rover.

The new rover travels **faster than** the last rover.

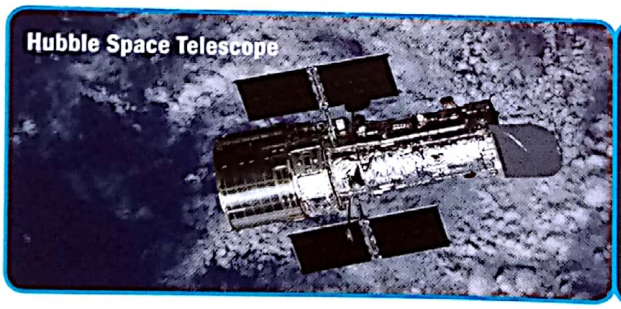
The new rover travels **the fastest** of all the rovers.

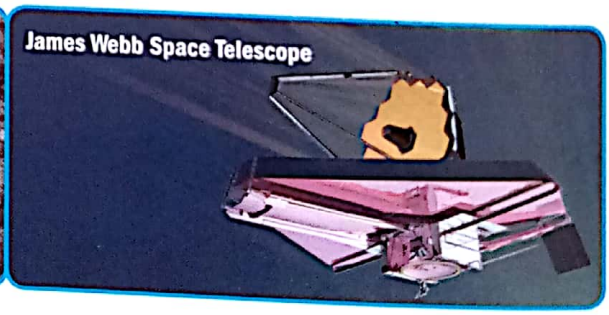
1 Complete the sentences. Use the correct form of the adverbs in brackets.

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!

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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, 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.

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?

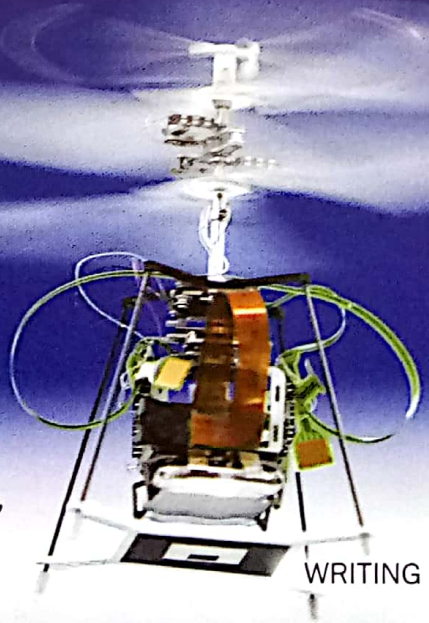
For those who dream of exploring outer space, the development of high-tech spacecraft is essential. But just one spaceship costs billions of dollars more to build than even the most complex robot. Many specialised robots could be designed and built much more cheaply than spaceships, and they could be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

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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

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?

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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.

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Express Yourself

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

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.

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

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

MARK
I don't see anything unusual.

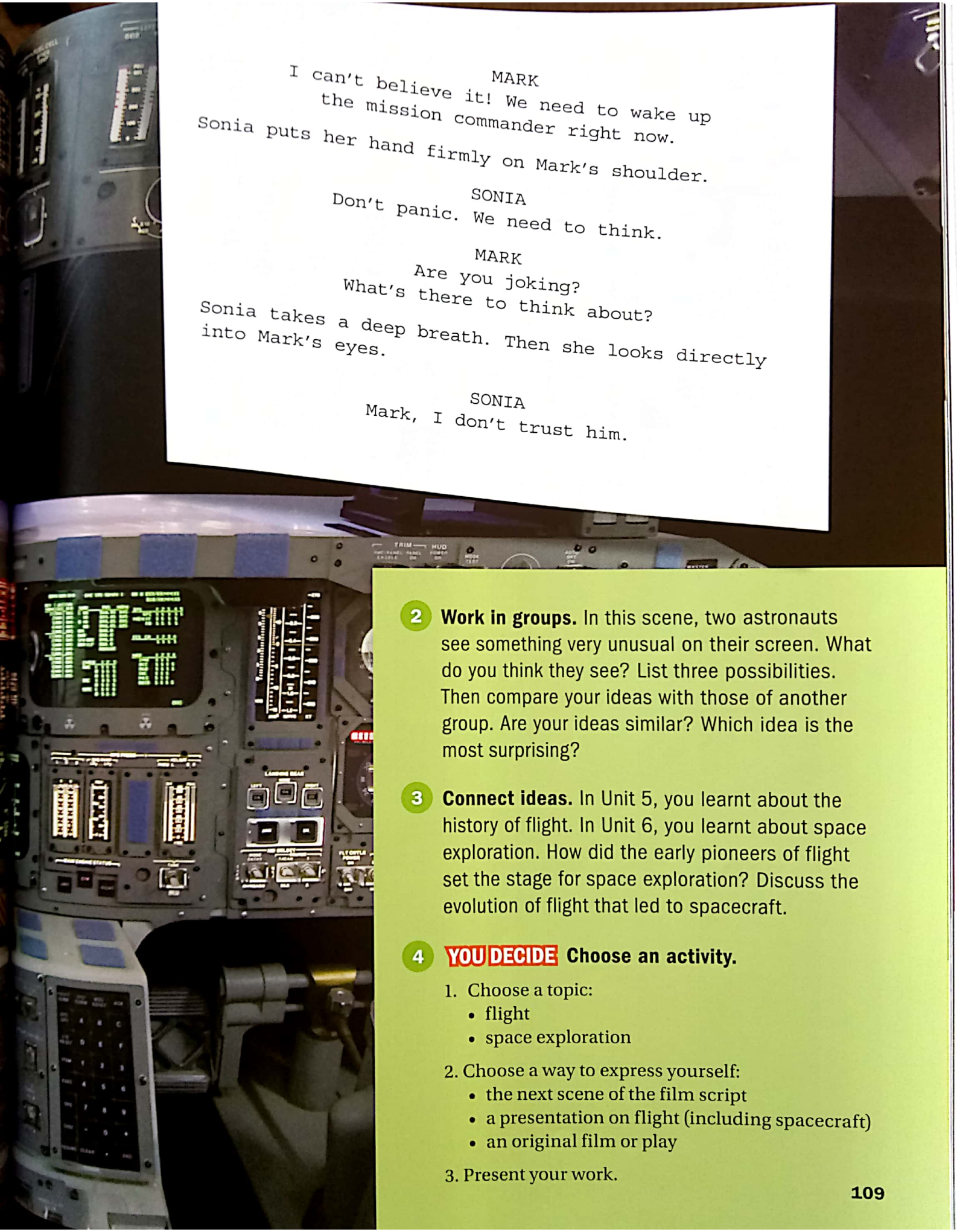
SONIA
Look at the top right corner.

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

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

SONIA
I know. But it's there.

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

Sonia puts her hand firmly on Mark's shoulder.

SONIA
Don't panic. We need to think.

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

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

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.**

1. Choose a topic:
   - flight
   - space exploration
2. Choose a way to express yourself:
   - the next scene of the film script
   - a presentation on flight (including spacecraft)
   - an original film or play
3. Present your work.

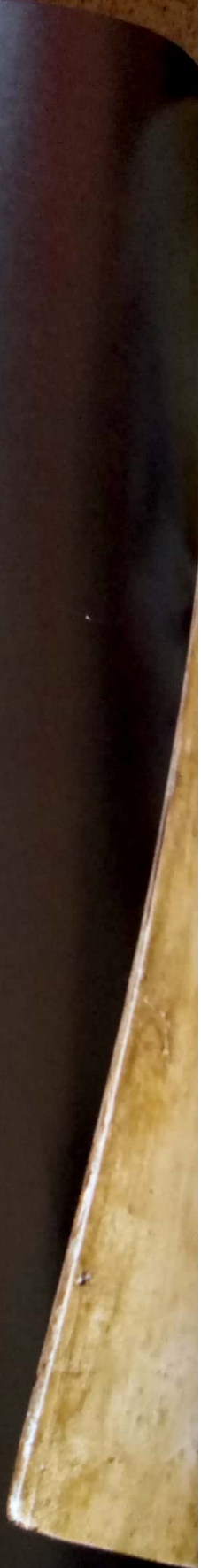
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Unit 7

Visual Stories

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

Ami Vitale



TO START

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?

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

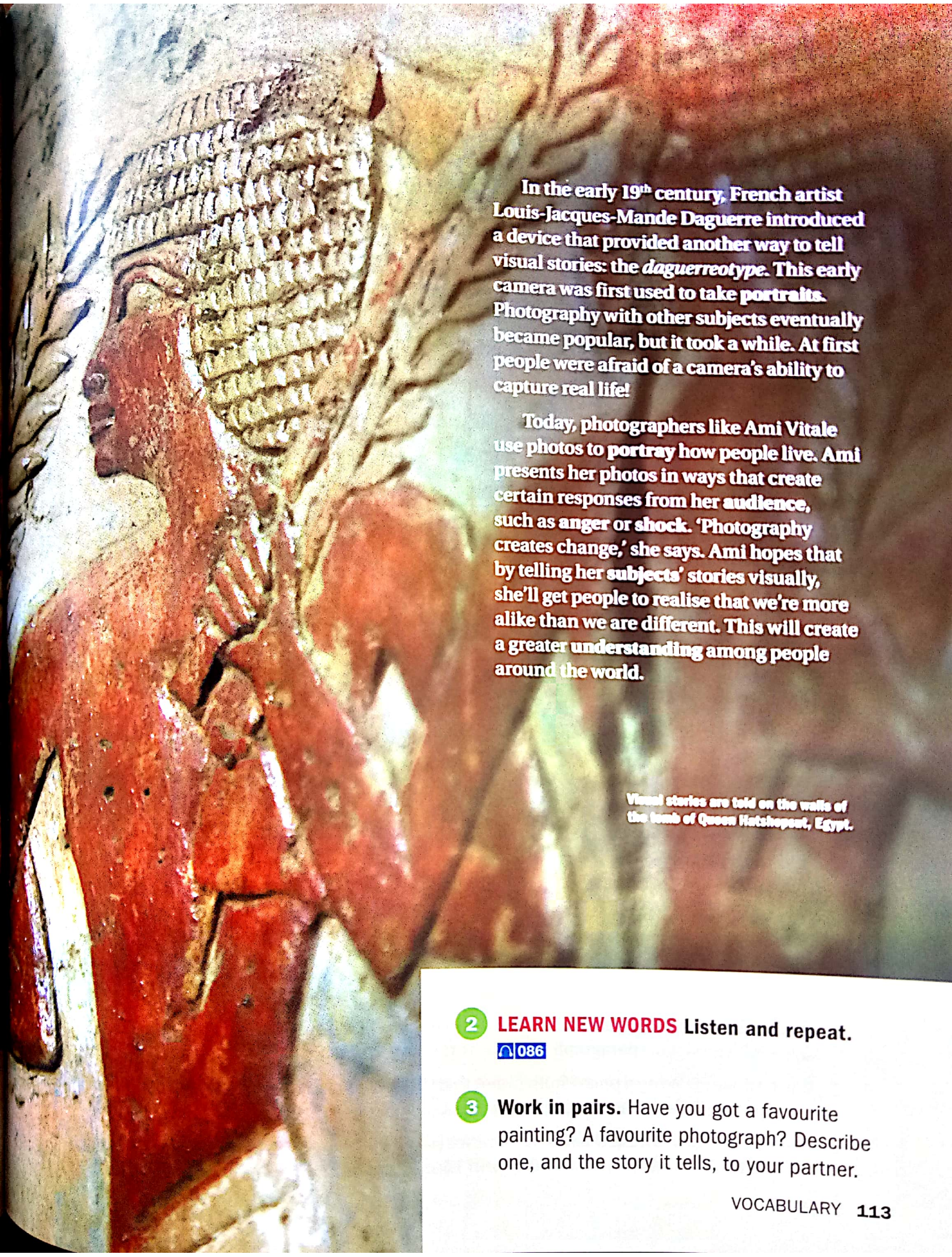
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1 **Why are stories important? How are they told?** Discuss. Then listen and read. 085

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.

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In 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.

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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.


Ami Vitale

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

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.**

1. **Work independently.** Research cave paintings or images from Egyptian tombs. Choose a selection and write a paragraph to describe the story it tells.
2. **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.
3. **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.

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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 169.

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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

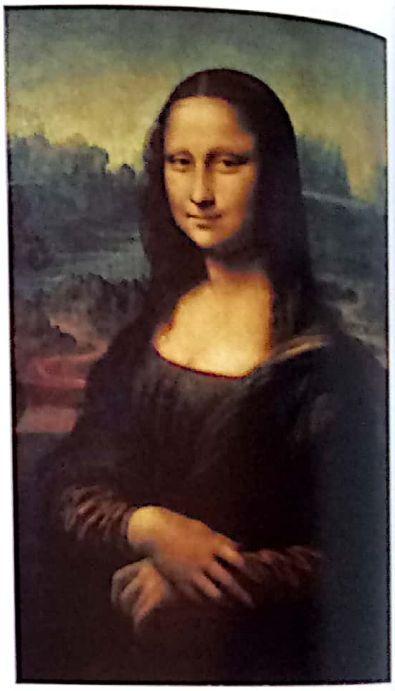
ask	capture	create	die	display	do	invent
make	pay	require	spend	take	use	work

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

Who painted the *Mona Lisa*?

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

1. *Mona Lisa* / paint / da Vinci
2. Flyer III / build / Wright brothers
3. early camera / invent / Daguerre
4. cave paintings / create / early humans



Mona Lisa (La Gioconda) **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? _____



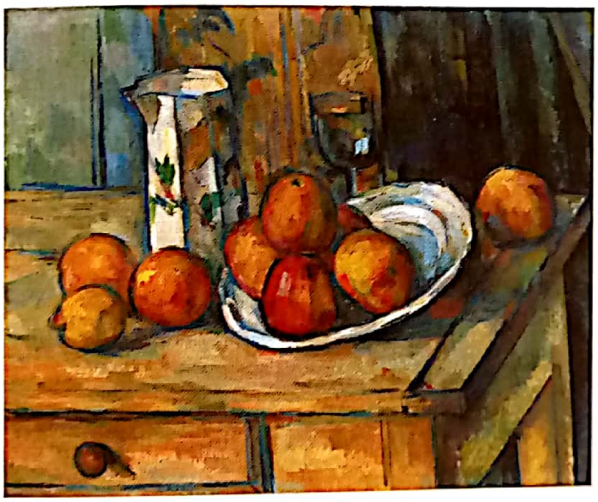
Portrait of a Young Woman **by Jean-Étienne Liotard**

Scanned by CamScanner

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



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.

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BRINGING STORIES TO LIFE

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



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.



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

Which animated TV programmes and films did you watch as a child?

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** **Underline each of the different methods of animation mentioned in the text.** 096

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HOW ANIMATION HAS CHANGED OVER THE YEARS

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!

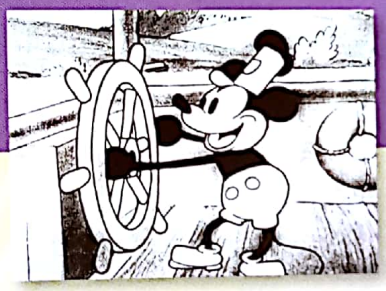
1917

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



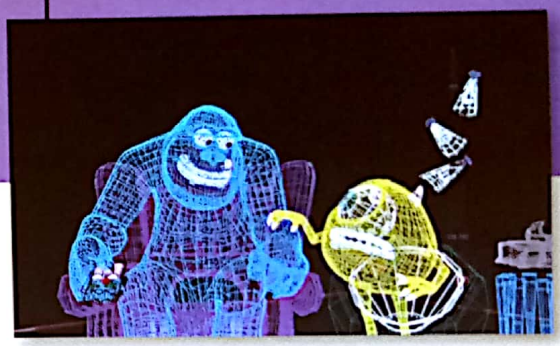
1928

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.



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 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.

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VIDEO

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.

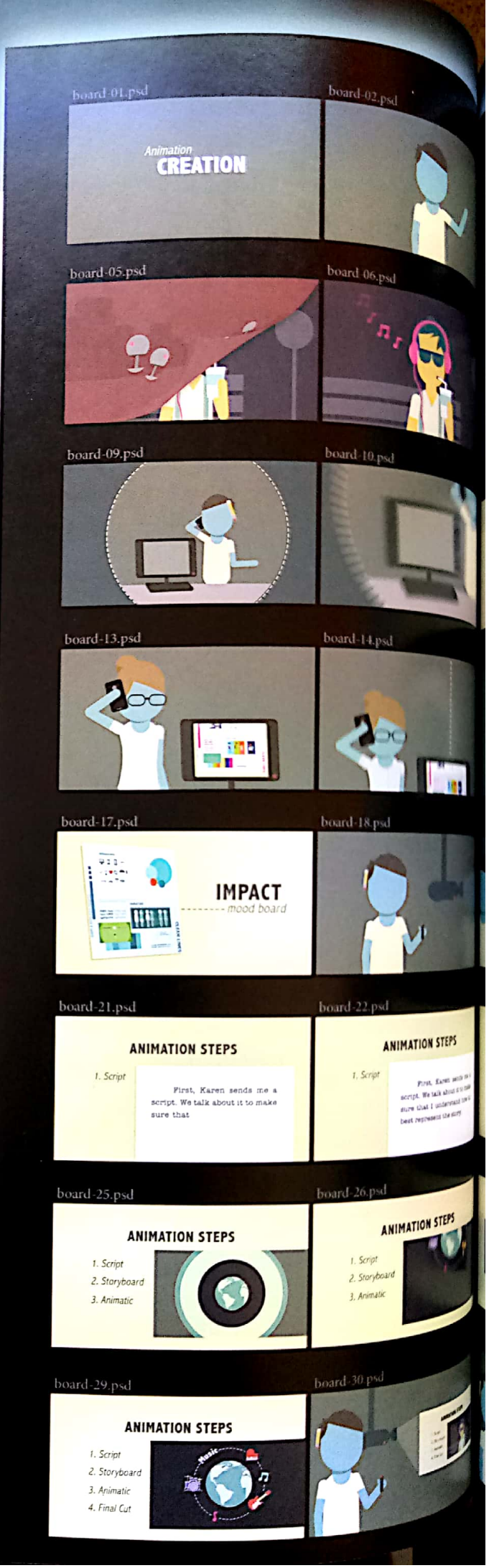
2 Read. You're going to watch a video called *Animation Creation*. Look at the storyboard on this page and read the three sentences. Which idea do you think will be most related to the video's content? Circle the letter.

a. An animation is created more quickly than a live TV programme because there's little to prepare.
b. Animations are popular because they're easy to make and cost very little money.
c. 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.

1. Who are the people involved in making the animation?
2. What is the purpose of a mood board?
3. What are the three stages of creating an animation?
4. What is added at the animatic stage?
5. What is the last step in creating an animation?



A storyboard

Scanned by CamScanner



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.**

1. **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.
2. **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.
3. **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.

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GRAMMAR 097

Reported speech: Describing what others say

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

1 **Listen.** You will hear how to draw a manga. 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 manga?
   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.



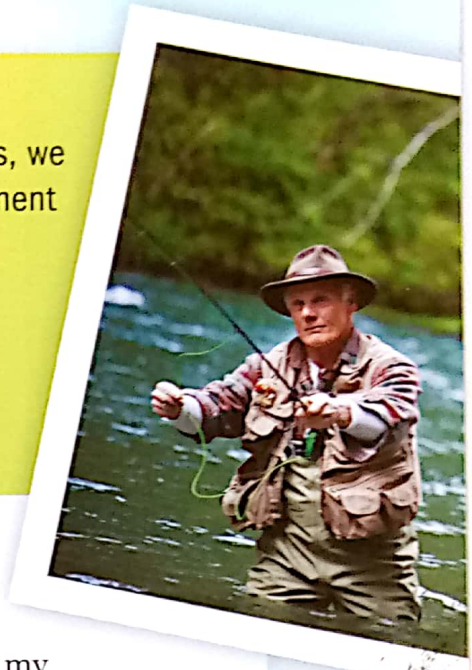
Go to page 171.

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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.

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!'

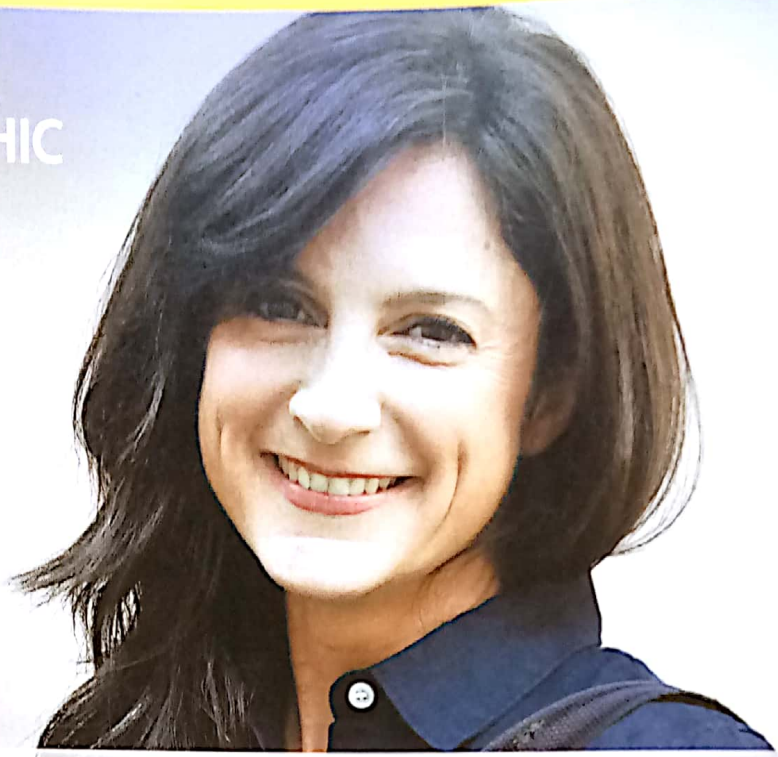
'Well,' he said. 'When I was a boy, fishing wasn't "nothing". In fact, it was everything. I didn't have TV, or video games or smartphones. So I fished. Now, when I fish, I go back to being that boy. It was a happy time.'

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. Use reported speech and quotations to tell what people said.

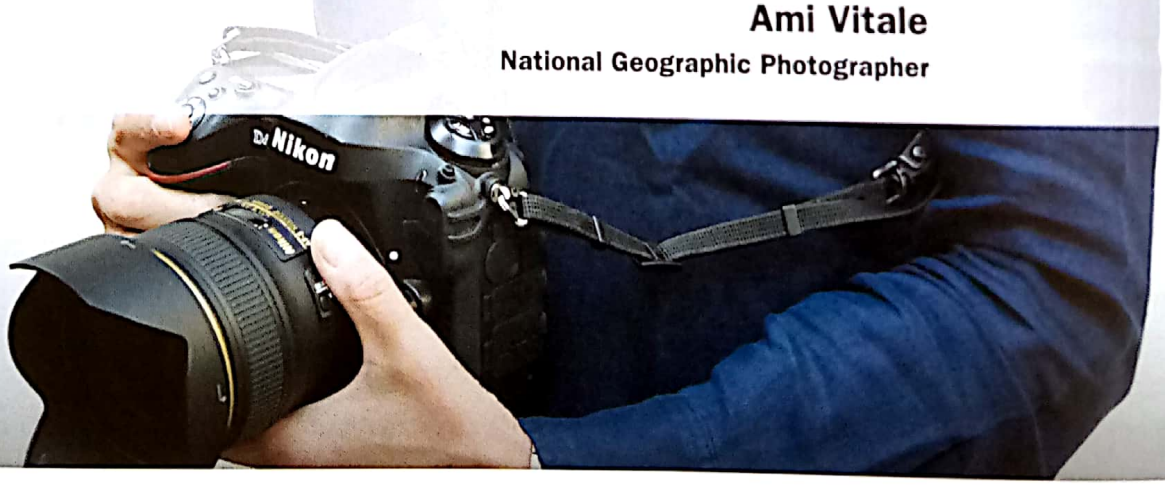
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Tell Stories

'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



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.

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Make an Impact

YOU DECIDE **Choose a project.**

1 Create a flipbook.

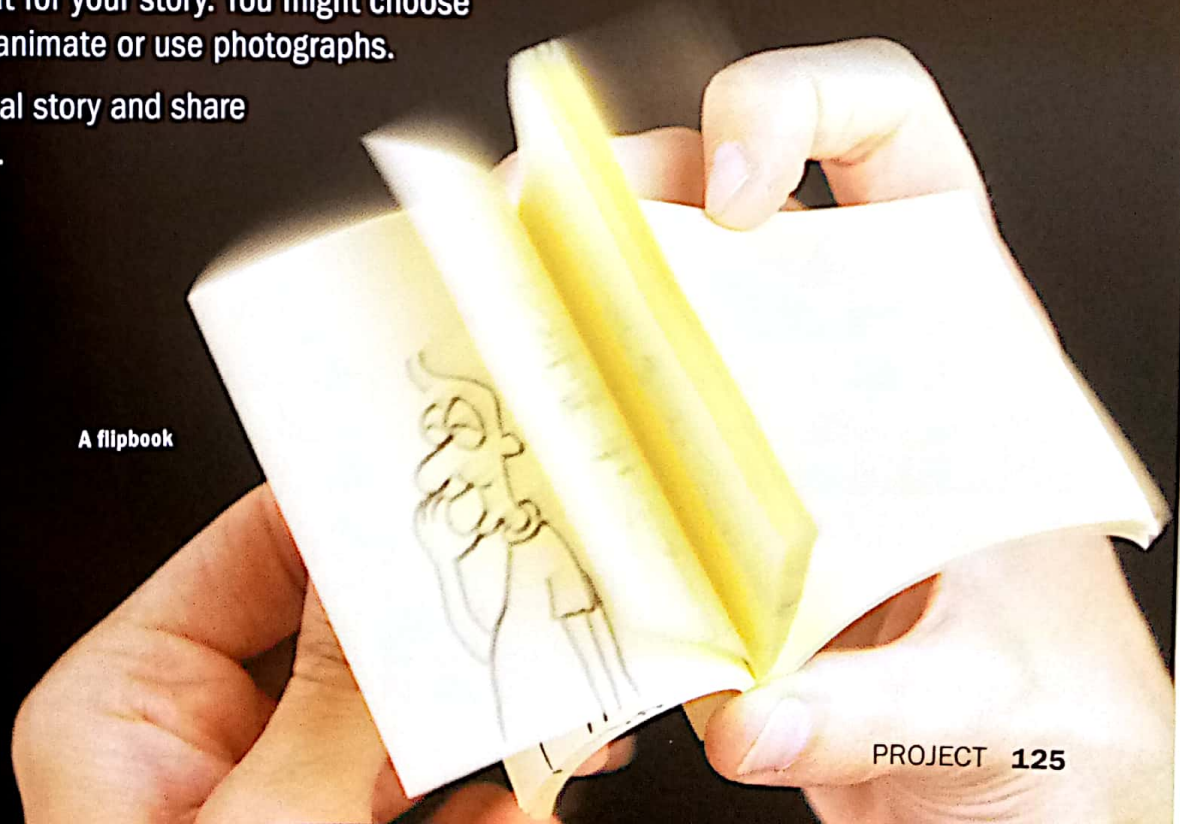
- Assemble a small book. Draw on each of the pages to create animation when you flip it.
- Share your book with the class. Describe the story it tells.
- Explain the process of making your book. Answer your classmates' questions.

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

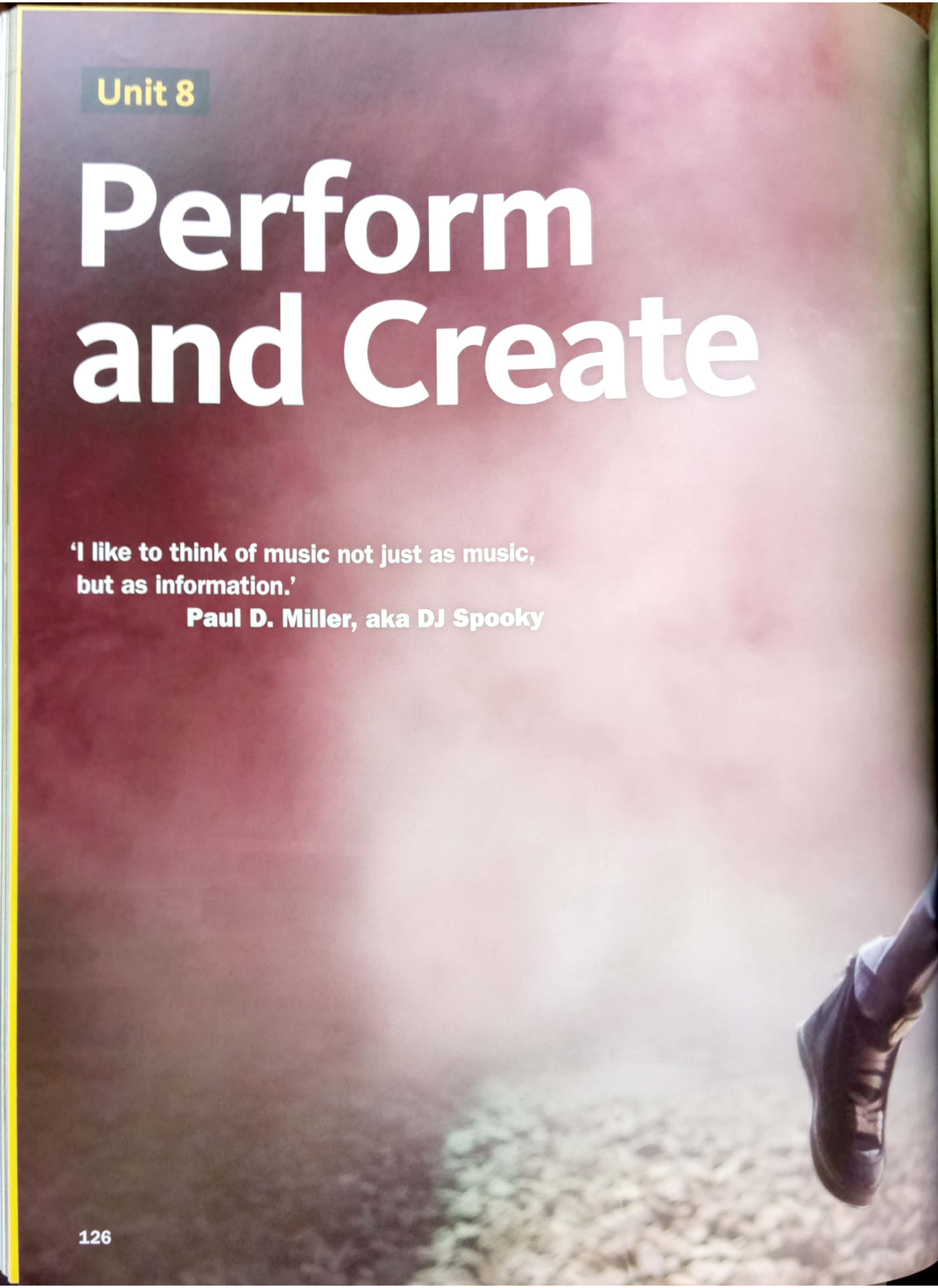
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Unit 8

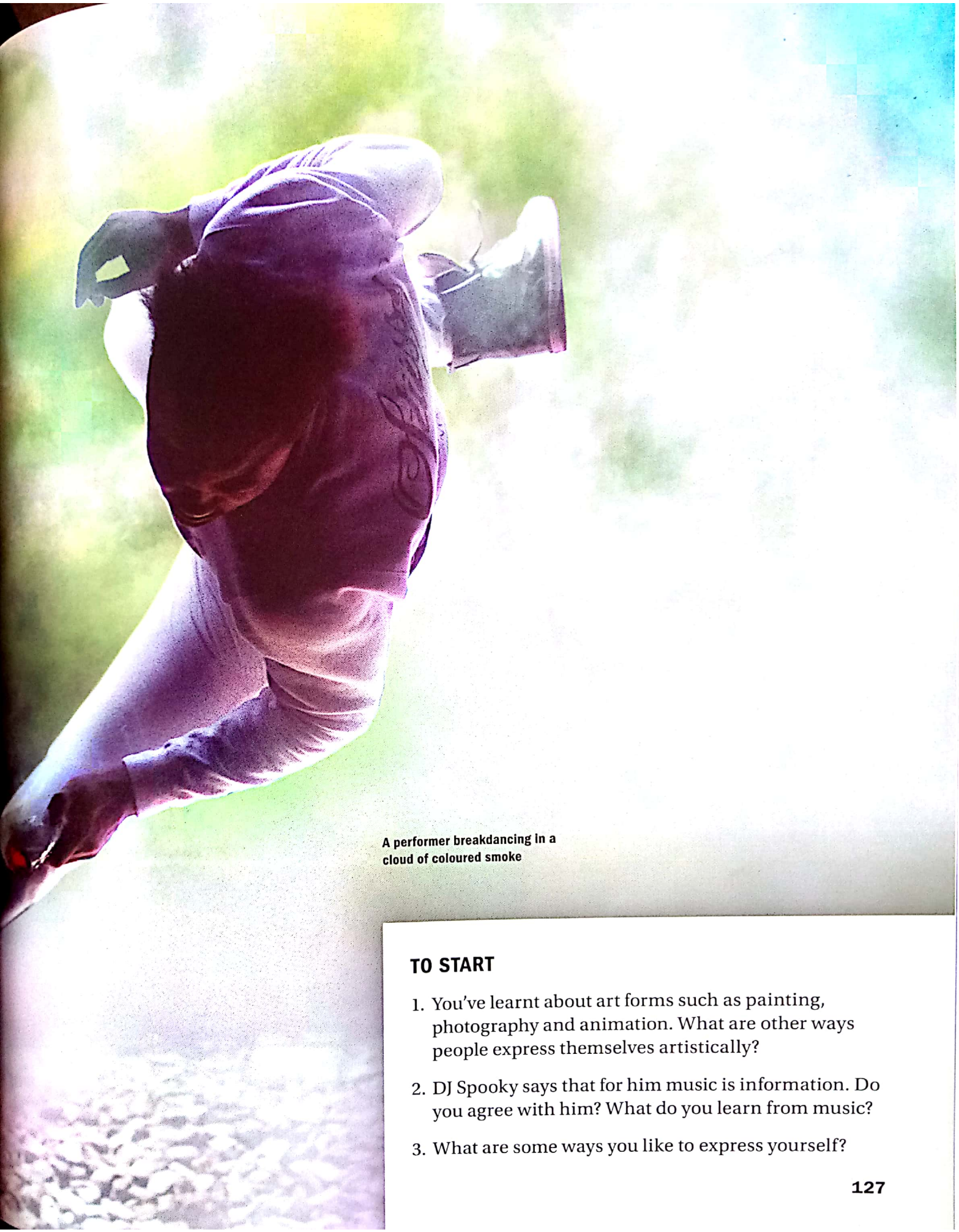
Perform and Create

'I like to think of music not just as music, but as information.'

Paul D. Miller, aka DJ Spooky



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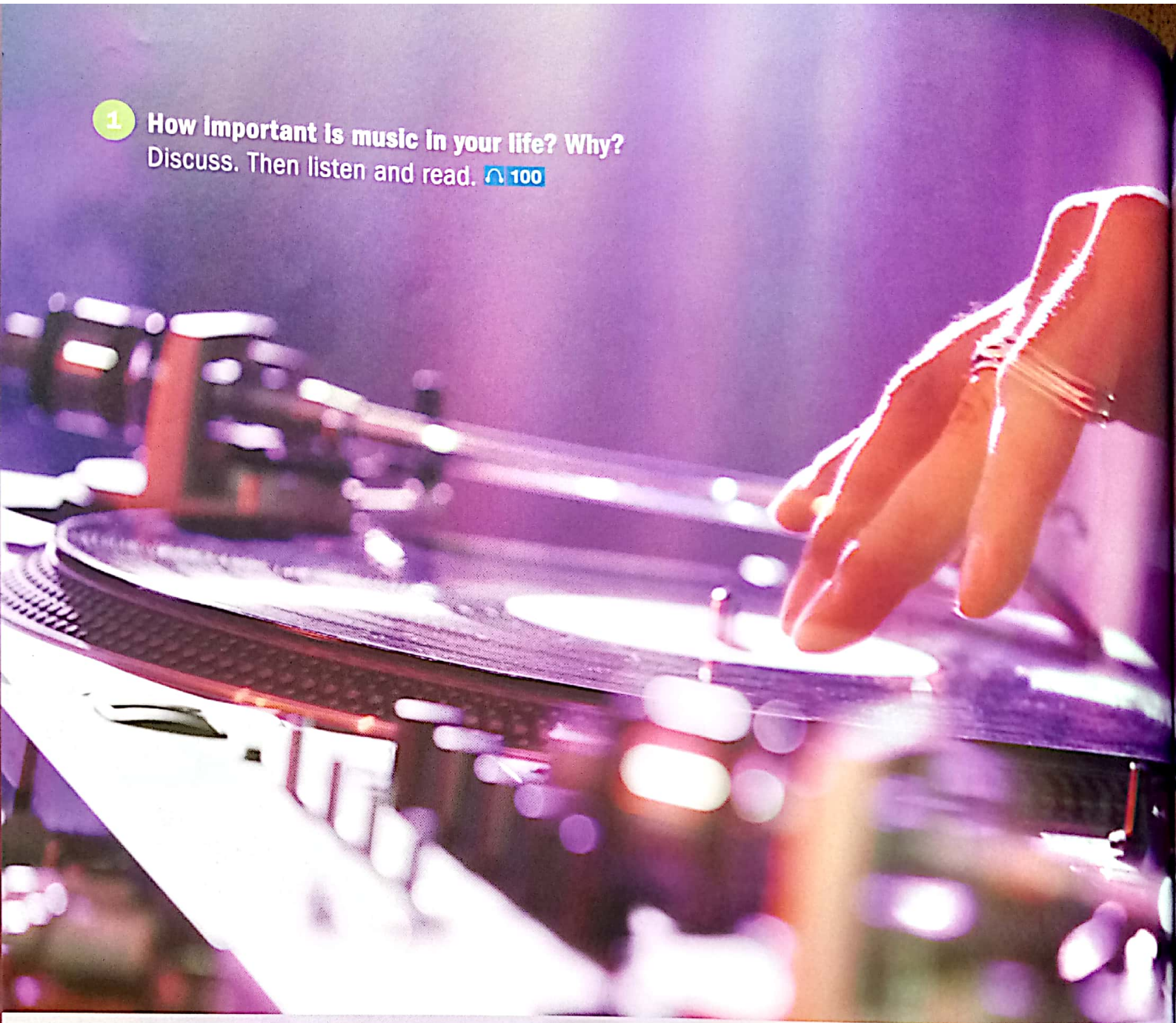


A performer breakdancing in a cloud of coloured smoke

TO START

1. You've learnt about art forms such as painting, photography and animation. What are other ways people express themselves artistically?
2. DJ Spooky says that for him music is information. Do you agree with him? What do you learn from music?
3. What are some ways you like to express yourself?

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1 **How important is music in your life? Why?** Discuss. Then listen and read. 100

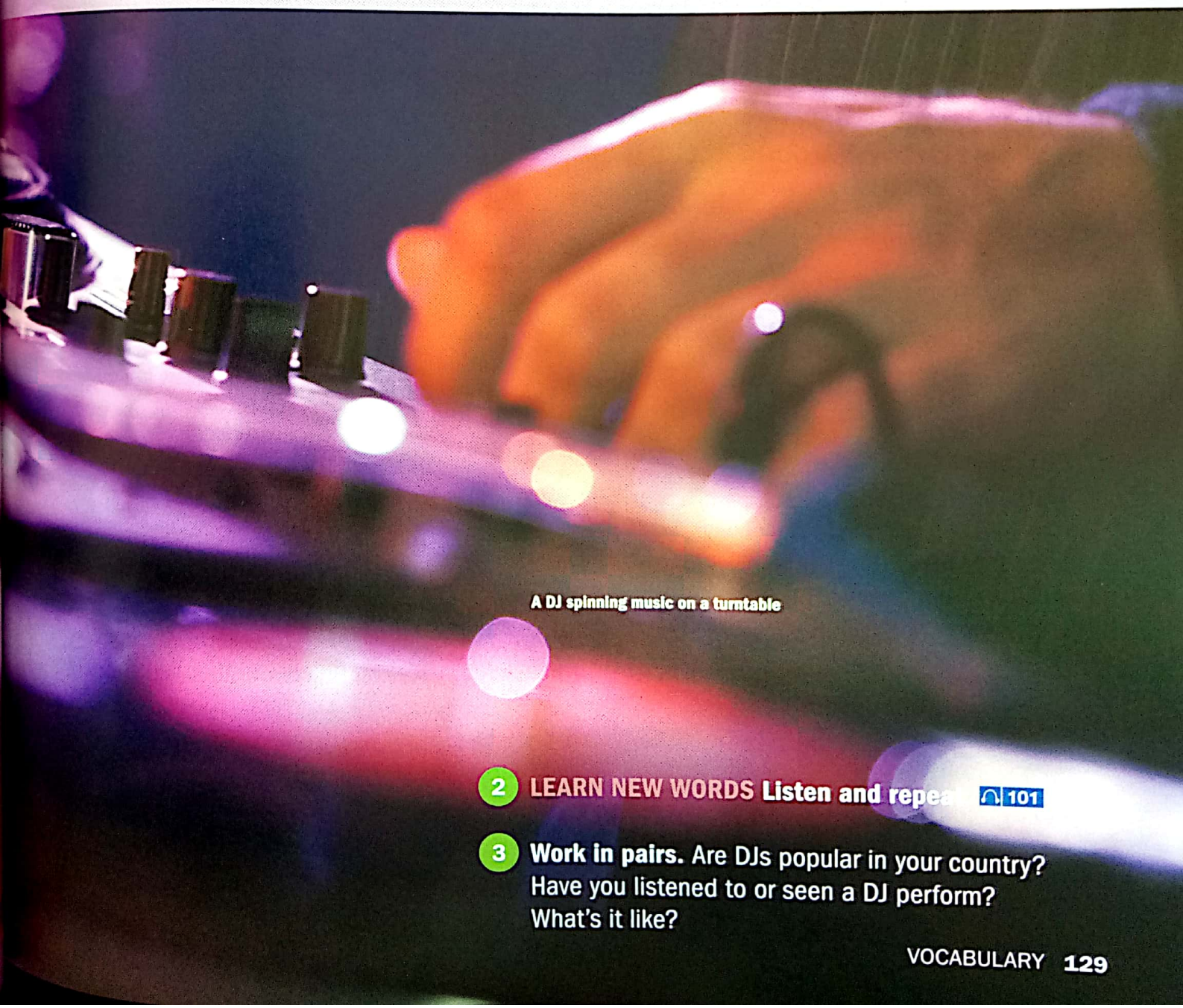
Music is an essential part of many people's lives. Whether it's live or recorded, music is a **means** of **entertainment** to almost everyone. But for musicians, music is about more than just enjoyment: it's a form of **self-expression**. When we think of creating music, we think of the **composers** who write music and **lyrics** and the **performers** who play these songs. But a different kind of musical self-expression has become popular over the last few decades: being a DJ. A DJ chooses and plays pre-recorded music for an audience. He or she mixes and **manipulates** the rhythms and **beats** using different creative methods. Although the style **varies** depending on the DJ, the result is usually a high-energy sound that's perfect for dancing.

The term *DJ* comes from the words *disc* and *jockey*. The word *disc* refers to a vinyl record. Records may seem old-fashioned to people who download music from the Internet, but many DJs today still use them to spin. At a club a DJ might mix on a computer, a tablet, a turntable or any combination of the three.

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DJs don't just work at clubs. They play at events, such as weddings and birthday parties. DJs also play and discuss music on a podcast or at a radio station. In fact, DJs have been on the radio for more than a century. The very first DJ, Ray Newby, was only 16 when he played music on a small radio in 1909. Over the years, radio DJs chose what music to **expose** audiences to. Hearing their own songs on the radio brought musicians **satisfaction**. More importantly, a DJ playing your song was an indication that **fame** was on the way!

Today, DJs themselves are international stars. For example, Dutch-born DJ Tiësto **gained recognition** performing at the 2004 Summer Olympics. By 2012, he was earning millions of dollars a year. Some DJs use their fame to be **influential**. For example, DJ Spooky composed the *Terra Nova/Sinfonia Antarctica* to raise awareness about environmental issues. This is not your typical symphony. This music mix is the portrait of a continent threatened by climate change. For DJ Spooky, being a DJ is more than just playing music – it's about making others think!



A DJ spinning music on a turntable

2 **LEARN NEW WORDS** **Listen and repea** 101

3 **Work in pairs.** Are DJs popular in your country? Have you listened to or seen a DJ perform? What's it like?

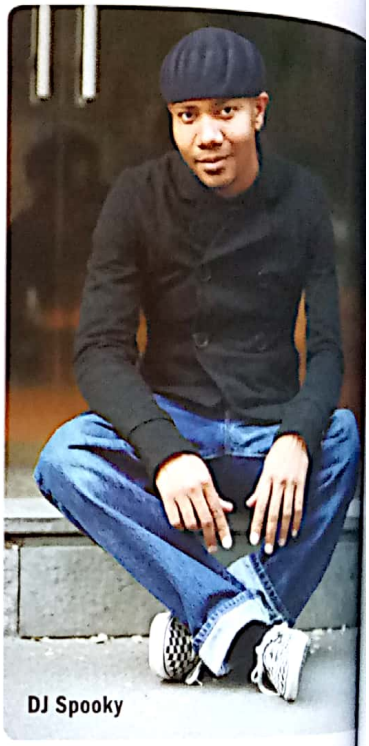
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4 **Read and write the words from the list.** Make any necessary changes.

beat	composer	entertainment	influential	lyrics
manipulate	means	performer	satisfaction	vary

Paul D. Miller is a musician, writer and _____ who performs as DJ Spooky. He's known around the world for his ability to entertain audiences by mixing hip-hop _____. But DJ Spooky sees his complex work as much more than _____. He sees it as a _____ of informing the public about important issues such as climate change, sustainability and the role of technology in society. He wants his music to be _____ in changing how people think.

DJ Spooky's multimedia presentations _____ from recordings, animation, books and videos to lectures and art installations. He even has a free, open-source app that provides other DJs with tools to mix, scratch and add electronic effects to their own music. This way they can be _____, too.



DJ Spooky

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

enjoyment	essential	indication	symphony

_____ 1. happiness or pleasure

_____ 2. necessary

_____ 3. a musical composition with many instruments

_____ 4. a sign or signal

6 **YOU DECIDE** **Choose an activity.**

1. **Work independently.** Think of a DJ performance you've seen, or find one online. Write a review of the performance.
2. **Work in pairs.** Discuss the following questions: Why is music important? Where and how do you listen to music? Where do you get information about new music?
3. **Work in groups.** Research a popular DJ, and find a sample of his or her recordings. Present your research to the class. Play the audio clip and describe the music. Talk about the DJ's style and message.

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SPEAKING STRATEGY 104

Asking for feelings and opinions	Expressing feelings and opinions
How do you feel about jazz?	I'm crazy about jazz.
What are your thoughts on hip-hop?	I'm a big fan of hip-hop.
	It's all right, I guess.
	I'm not wild about hip-hop.
What do you think about going to the opera?	I can't stand listening to opera.



1 Listen. How do the speakers ask for and express opinions? Write the phrases you hear. 105

2 Read and complete the dialogue.

Abram: Marina, do you play an instrument?

Marina: Yes, I actually play three. _____ music!

Abram: Me, too. _____ playing the guitar. It's how I express myself. What instruments do you play?

Marina: Well, I've been playing piano since I was four. _____ It's not my favourite. I play the violin and the flute, too. The violin is my favourite.

Abram: Yeah, string instruments are great because you can play them anywhere. I tried to play the piano, but _____ being stuck in the house all day practising. With my guitar I can practise wherever I go.

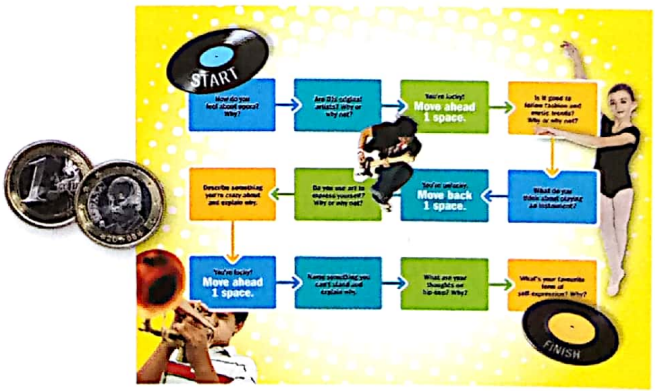
Marina: _____ getting together to do a song – me on the violin, you on the guitar?

Abram: Sure! We'd have to think about what musical style we'd want to work on.

Marina: _____ rock? I know some really cool songs with violin solos.

Abram: Sounds great!

3 Work in groups. Take turns. Use a coin to move (heads = 1 space; tails = 2 spaces). Express your feelings and opinions.



4 Work in pairs. Find out what you have in common. Find three things that you're both crazy about and three things you can't stand.

Go to page 173.

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GRAMMAR 106

Gerunds and infinitives

Dancing is a popular form of self-expression.

Some people like **performing/to perform** as comedians.

Other people are interested in **acting** in videos and plays.

Building an audience of fans for a performer's work is important.

It's important **to build** an audience of fans for a performer's work.

Post information about the show on social media **to get** a big audience.



A living statue

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

_____ (Express) yourself can happen in unusual ways. Some people are enthusiastic about _____ (pretend) to be statues or sculptures. They like _____ (trick) people! If the performers are outside, people usually walk by without _____ (realise) the statues are actually alive. Other living statues prefer _____ (work) as entertainers for companies that send them to different events and locations. And others like _____ (enter) contests. For instance, it's the dream of many living statues _____ (win) the annual International World Championship of Living Statues. _____ (Judge) takes place in three categories: professionals, amateurs and children.

2 Work in pairs. Rewrite the sentences.

1. Seeing a living statue move would surprise me.

   It _____

2. Creating an interesting look is important for a living statue.

   It _____

3. Standing still for a long time can be very difficult.

   It _____

3 Work in groups. Take turns creating and answering questions using the words provided with gerunds or infinitives.

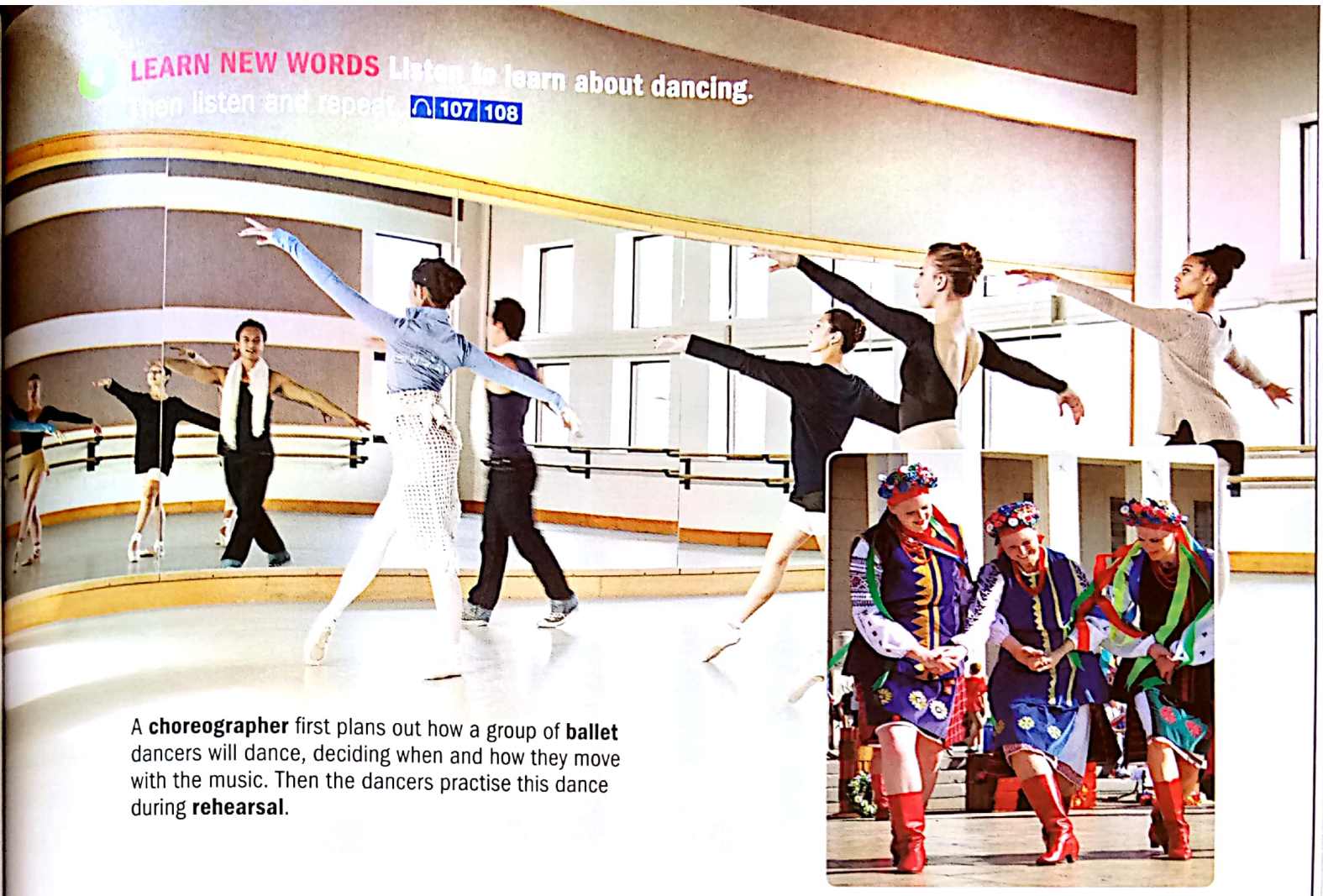
bored with	excited about	like	prefer

Do you ever get bored with dancing?

No, but I get bored with watching dance programmes on TV.

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LEARN NEW WORDS Listen to learn about dancing. Then listen and repeat. 107 108



A **choreographer** first plans out how a group of **ballet** dancers will dance, deciding when and how they move with the music. Then the dancers practise this dance during **rehearsal**.

Folk dancing

5 Read. Match the term to its clue.

_____ 1. folk dancing	a. a dance typically performed to classical music
_____ 2. choreographer	b. dancing to fast, rhythmic music
_____ 3. hip-hop dancing	c. performing a dance that's been done for generations
_____ 4. ballet	d. a time for working with a choreographer or director
_____ 5. rehearsal	e. a person who plans dancers' movements

6 Work in groups. Talk about different forms of artistic expression. Use words from each box, plus a gerund or infinitive.

animation	**be essential**
dance	**dislike**
DJ	**interested in**
living statue	**know about**
music composition	**prefer**
paint	

I'm interested in working as a DJ. What do you think?

Well, it's essential to know a lot about music! Do you?

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1 BEFORE YOU READ Discuss in pairs. Look at the photo. Describe what you see.

2 LEARN NEW WORDS Find the words below in the reading. What do you think they mean? Find antonyms for the words *freeze* and *dirty*. Then listen and repeat. 109

melt	orchestra	pure	stage	tribute

3 WHILE YOU READ Draw two conclusions about the Ice Music Festival. 110

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

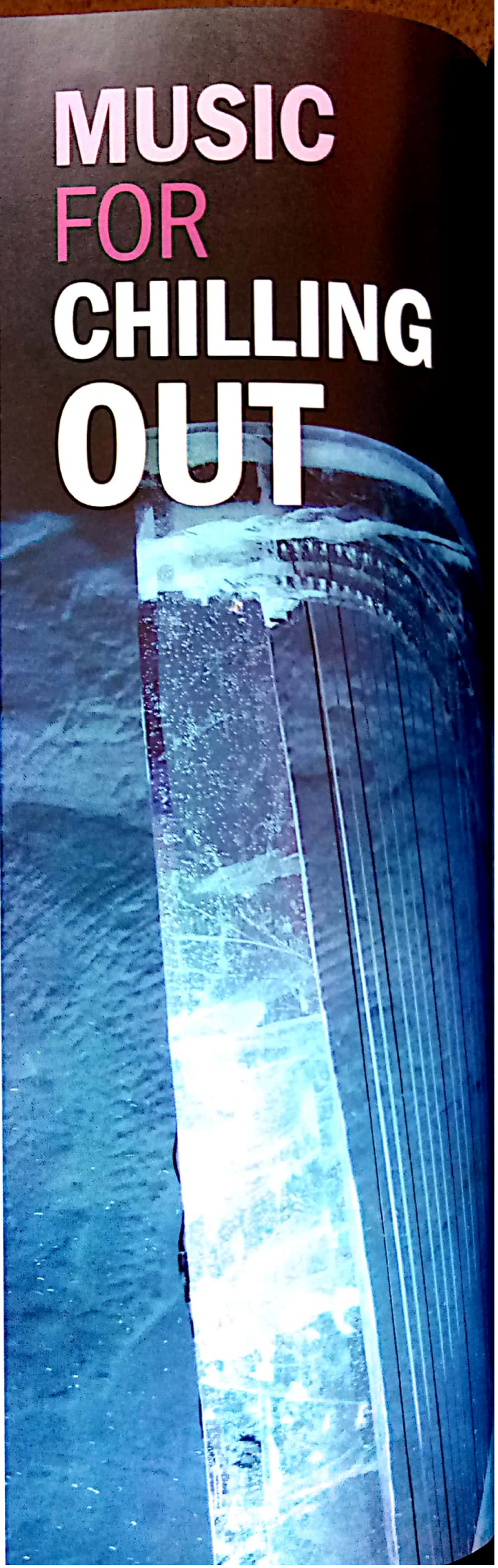
1. Who is Terje Isungset?
2. What does Terje refer to as 'art by accident'?
3. Who works together to make the instruments?
4. How are the instruments created?
5. What are three challenges facing musicians who perform at the festival?

5 Work in pairs. Compare the conclusions that you drew in Activity 3 with your partner's. Think of an additional conclusion you can draw about the festival.

6 Discuss in groups.

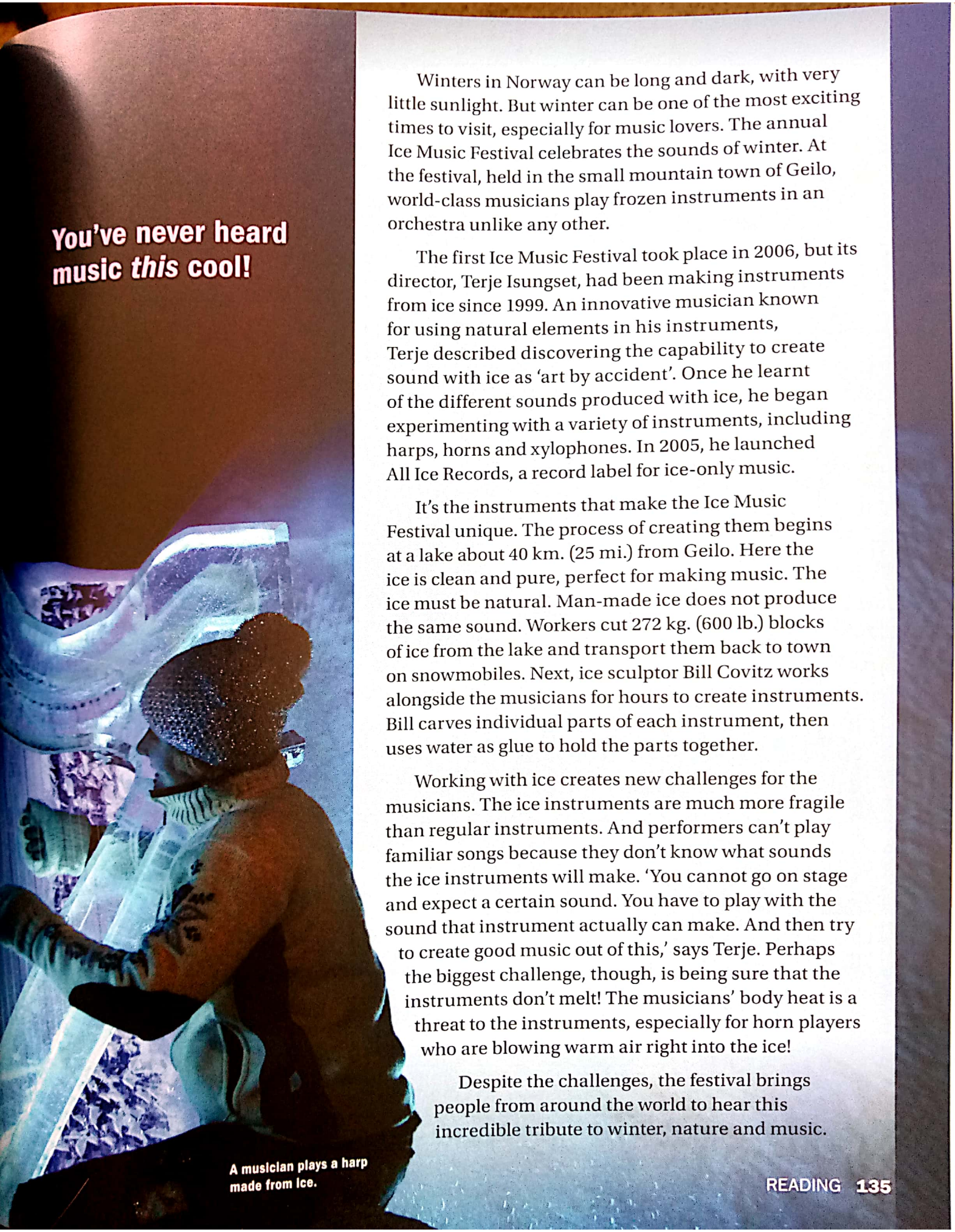
1. The performers at the Ice Music Festival must make music with their instruments with little rehearsal. What are the disadvantages of this process? What might the benefits be?
2. Describe a concert or music festival that you attended. What do you think organisers did to plan the event? Compare the process with that of the Ice Music Festival.
3. Would you like to attend the Ice Music Festival? Why or why not?

MUSIC FOR CHILLING OUT



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You've never heard music *this* cool!



A musician plays a harp made from ice.

Winters in Norway can be long and dark, with very little sunlight. But winter can be one of the most exciting times to visit, especially for music lovers. The annual Ice Music Festival celebrates the sounds of winter. At the festival, held in the small mountain town of Geilo, world-class musicians play frozen instruments in an orchestra unlike any other.

The first Ice Music Festival took place in 2006, but its director, Terje Isungset, had been making instruments from ice since 1999. An innovative musician known for using natural elements in his instruments, Terje described discovering the capability to create sound with ice as 'art by accident'. Once he learnt of the different sounds produced with ice, he began experimenting with a variety of instruments, including harps, horns and xylophones. In 2005, he launched All Ice Records, a record label for ice-only music.

It's the instruments that make the Ice Music Festival unique. The process of creating them begins at a lake about 40 km. (25 mi.) from Geilo. Here the ice is clean and pure, perfect for making music. The ice must be natural. Man-made ice does not produce the same sound. Workers cut 272 kg. (600 lb.) blocks of ice from the lake and transport them back to town on snowmobiles. Next, ice sculptor Bill Covitz works alongside the musicians for hours to create instruments. Bill carves individual parts of each instrument, then uses water as glue to hold the parts together.

Working with ice creates new challenges for the musicians. The ice instruments are much more fragile than regular instruments. And performers can't play familiar songs because they don't know what sounds the ice instruments will make. 'You cannot go on stage and expect a certain sound. You have to play with the sound that instrument actually can make. And then try to create good music out of this,' says Terje. Perhaps the biggest challenge, though, is being sure that the instruments don't melt! The musicians' body heat is a threat to the instruments, especially for horn players who are blowing warm air right into the ice!

Despite the challenges, the festival brings people from around the world to hear this incredible tribute to winter, nature and music.

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VIDEO

1 BEFORE YOU WATCH Discuss in pairs. You're going to watch a video about *stage fright*. Based on each of the words in the phrase, what do you think stage fright is? Who do you think would have stage fright?

2 Read and tick. The video you're going to watch is called *Stage Fright in the Spotlight*. Based on the title, predict what you'll learn. Tick all that apply.

- ☐ What stage fright is
- ☐ Why it's unusual to have stage fright
- ☐ What happens when you suffer from stage fright
- ☐ How to handle stage fright
- ☐ Why you should be afraid to be onstage

3 WHILE YOU WATCH List two ways to handle stage fright. Watch scene 8.1.

4 AFTER YOU WATCH Work in pairs to decide if each sentence is *true* or *false*. Tick the correct answer.

1. When you suffer from stage fright, your heart might beat faster. T F
2. Few people suffer from stage fright. T F
3. In a survey, the only thing people fear more than talking in front of others is death. T F
4. Entertainers may suffer from stage fright. T F
5. Understanding why stage fright happens is important for dealing with it. T F
6. Imagining the audience clapping and cheering will make you more afraid. T F

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5 **Work in pairs.** Think about your answer for Activity 1. Were you correct? Do you ever suffer from stage fright? If so, when? Explain what happens to you when you have to talk or perform in front of others. If not, explain how you handle speaking or performing in front of others.

6 **Discuss in groups.**

1. What do you fear most: flying, heights or speaking in front of other people? Explain your answer.
2. Talk about a time when you had to perform alone on a stage. When was it? How did you feel?
3. Think of at least two additional ways to deal with stage fright.

7 **YOU DECIDE** **Choose an activity.**

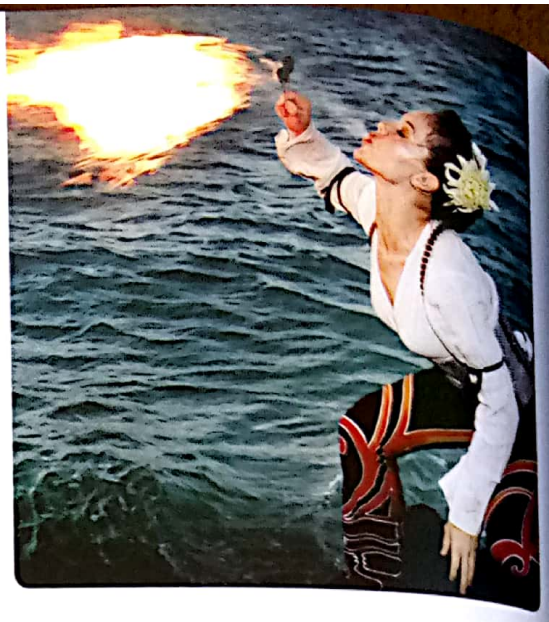
1. **Work independently.** Imagine you went to a performance in which the performer froze with stage fright. Write a review of the performance, including advice for the performer's next show.
2. **Work in pairs.** Role-play a dialogue between a performer and a choreographer or other trainer at a rehearsal. The performer is nervous that he will get stage fright during the performance. The trainer offers advice on what to do.
3. **Work in groups.** Find a video online of a performance where someone suffered from stage fright. Show the video to the class. Explain what happened and what the performer could have done differently.

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GRAMMAR 111

Sense verbs + infinitive: Describing what you see, hear and feel

Did you **see the band perform** in concert?
No, but I **heard them sing** on the radio.
Come on! Let's **watch the DJ spin** records.
We'd **been hearing them practise** for days before their performance.



1 **Listen.** Write sentences in the table about what the people did. 112

	See	Hear	Feel	Watch
Jian	He saw the WagakkiBand play.			
Mei				

2 **Work independently.** Write sentences about your own experiences using the verbs below.

1. hear / play I've never heard the WagakkiBand play before.
2. see / dance _____
3. feel / move _____
4. watch / juggle _____

3 **Work in pairs.** Cut out the cards and take turns selecting one. Then discuss your own experiences.

I've only ever seen an opera singer perform once. What about you?

I saw an opera singer perform on TV.



Go to page 175.

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WRITING

When we write an explanatory essay, we want to teach our reader about a topic. We must identify the topic in the first paragraph. Then we must provide additional facts, details and examples to help the reader better understand the topic. An explanatory essay does not include the writer's opinion.

1 **Read the model.** The writer is teaching us about a type of puppet show. Cross out the two sentences that don't belong in the explanatory essay.

Thai puppet performances are a unique form of cultural expression. I saw a Thai puppet show and it was amazing! In a performance, three puppeteers work together to move one beautiful, lifelike puppet to traditional music. Puppeteers must know Thai classical dance. As they dance, each puppeteer holds a wooden rod with a string attached to control different parts of the puppet.

There were different sizes and types of puppets used in Thai puppet performances throughout history, but the puppets used in modern performances are about 60 cm. (2 ft.) high and made of bamboo. Their heads are very realistic, and they wear detailed, elegant costumes. In fact, the costumes are often decorated with gold and jewels. On the inside, puppets have around 16 strings that connect their body parts to one another. Moving these strings allows the puppets to move smoothly and naturally.

Puppets have been a form of entertainment in Thailand for around 300 years, but the traditional Thai puppet performances gained popularity in the early 20th century. Master puppeteer Krae Saptawanit, who first created the small puppet in 1901, travelled around the country doing performances. However, interest in the shows decreased in the mid-20th century after Saptawanit's death. In 1985, a group of puppeteers formed to reintroduce the traditional art. I think this group is really good – probably better at performing the shows than the original artists. Today, these puppet shows are popular with local people and tourists alike.



2 **Work in pairs.** What did you learn about the art of Thai puppetry? Would you like to see a performance? Why or why not?

3 **Write.** Write an essay to explain a type of artistic expression. Remember to provide facts, details and examples to teach your reader about the topic.

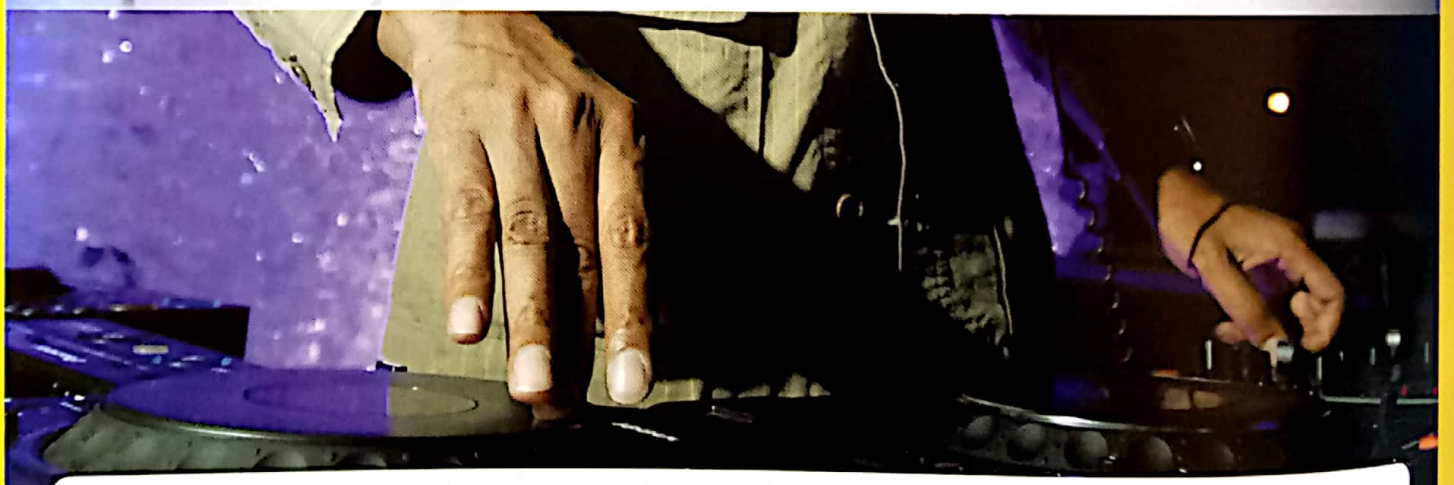
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Do Your Own Thing

'There are so many people who just let the world define them. What happens when you begin to realise another world is possible – that's art.'

Paul D. Miller, aka DJ Spooky
National Geographic Explorer, Artist/Writer/Musician



1. **Watch scene 8.2.**
2. What would you say your 'own thing' is? How does it bring you closer to other people? How does it help you stand out?
3. Do you let the world define you? Or do you define who you are? Or both? Explain with examples.

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Make an Impact

YOU DECIDE **Choose a project.**

1 Perform for your class.

- Choose a type of performing art to perform for the class.
- Before you perform, explain what you're going to do. Give background on the history and popularity of your performing art form. Talk about what you need to know and have in order to perform.
- Hold a question-and-answer session with the class after your performance.

2 Interview a performer.

- Think of a performing artist in your community. Prepare ten questions to ask the artist about the type of work he or she does.
- Conduct your interview. Audio record or film it.
- Play your interview for the class.

3 Make a timeline.

- Choose a type of performing art. Research its history.
- Make a timeline to illustrate the history of this performing art. Use photos to show how it's changed.
- Present your timeline to the class.



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Express Yourself

1 Look at and listen to the presentation. 113

NOT Your Typical Performance



Make up



Costumes



A visual story

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2 **Work in pairs.** In the presentation, you learn how performers express themselves in a variety of ways. Think of another famous performer (or group of performers) that uses a variety of methods for self-expression. What does this performer do? Do you like it? Why or why not?

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

Dakh Daughters



A variety of instruments

4 **YOU DECIDE** **Choose an activity.**

1. Choose a topic:
   - visual stories
   - performances
2. Choose a way to express yourself:
   - a storyboard or animation
   - a computer presentation
   - a performance
3. Present your work.

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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.

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 self-conscious when you were younger, 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)

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.** 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 pit bulls. (B: read about them)

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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.

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, _____ .

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.** 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.

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Unit 5

Past perfect

1 **Listen.** Notice how *had* sounds in the past perfect. 123

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

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.

2 **Listen and repeat.** Circle the two reduced examples of *had*. 124

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. 125

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.

Unit 6

Final *d* + *you*

1 **Listen.** Notice how the final *d* links with the *y* in *you*. 126

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 **j**uice).

2 **Listen and repeat.** Draw an arrow to link the final *d* words to *you*. 127

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.

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Unit 7

Final /ə/ sound

1 Listen. Listen for the final ə sounds. Can you hear them? 128

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*.

2 Work in pairs. Listen to the names of the professions. Decide if they end in *–er* or *–or*. 129

1. philosoph _____.
2. art direct _____.
3. web develop _____.
4. doct _____.
5. carpent _____.

3 Write the names of the professions. Then listen and check. 130

1. Someone who works in a school is a _____.
2. The famous _____ played the part of Hamlet.
3. Jack Andraka is a young _____.
4. Someone who studies the stars is an _____.

Unit 8

Rhythm and stress

1 Listen. Notice the rhythm. 131

mu **si** cian

You **miss** him.

Stressed words or syllables create a strong beat. The rhythm of English depends on the number of strong beats, not the number of words. Listen to these sentences. The rhythm is the same for each.

Joe **plays** **drums**.

Joe can **play** the **drums**.

Joe is **playing** the **drums**.

Joe has been **playing** the **drums**.

Joe should've been **playing** the **drums**.

The unstressed words are often shortened to keep the rhythm.

2 Listen and repeat sentences *a* and *b*. Clap to the rhythm. Then listen to sentences 1–5 and match the rhythm pattern. Write *a* or *b*. 132

a. I'm **cra**zy about **jazz**. b. I **can't stand o**pera.

1. a Her **mu**sic is **great**.
2. _____ I **felt** the **ground shake**.
3. _____ Is he **go**ing to the **show**?
4. _____ I **saw** the **band play**.
5. _____ Her **voice** is **beau**tiful.

3 Work in pairs. Listen and repeat the dialogues. Then practise them, adding your ideas. Use correct rhythm. 133

I can **play** a **mu**sical **in**strument. — **What in**strument? — The gui**tar**.

1. A: I can **play** a **mu**sical **in**strument. B: **What in**strument?
2. A: I **can't play** _____. B: **That's** a **sha**me.
3. A: I'm **cra**zy about this **band**. B: **What band** is it?

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Irregular Verbs

Infinitive	Past simple	Past participle
be	were	been
beat	beat	beaten
become	became	become
begin	began	begun
bend	bent	bent
bet	bet	bet
bite	bit	bitten
bleed	bled	bled
blow	blew	blown
break	broke	broken
bring	brought	brought
build	built	built
burn	burnt	burnt
buy	bought	bought
carry	carried	carried
catch	caught	caught
choose	chose	chosen
come	came	come
cost	cost	cost
cut	cut	cut
deal	dealt	dealt
dig	dug	dug
dive	dived	dived
do	did	done
draw	drew	drawn
dream	dreamt	dreamt
drink	drank	drunk
drive	drove	driven
dry	dried	dried
eat	ate	eaten
fall	fell	fallen
feed	fed	fed
feel	felt	felt
fight	fought	fought
find	found	found
flee	fled	fled
fly	flew	flown
forbid	forbade	forbidden
forget	forgot	forgotten
forgive	forgave	forgiven
freeze	froze	frozen
fry	fried	fried
get	got	got
give	gave	given
go	went	gone
grind	ground	ground
grow	grew	grown
hang	hung	hung
have	had	had
hear	heard	heard
hide	hid	hidden
hit	hit	hit
hold	held	held
hurt	hurt	hurt
keep	kept	kept
kneel	knelt	knelt
knit	knitted	knitted
know	knew	known
lay	laid	laid
lead	led	led
leave	left	left
lend	lent	lent
let	let	let
lie (down)	lay	lain
light	lit	lit
lose	lost	lost
make	made	made
mean	meant	meant
meet	met	met
overcome	overcame	overcome
pay	paid	paid
put	put	put
quit	quit	quit
read	read	read
ride	rode	ridden
ring	rang	rung
rise	rose	risen
run	ran	run
say	said	said
see	saw	seen
sell	sold	sold
send	sent	sent
set	set	set
sew	sewed	sewn
shake	shook	shaken
shine	shone	shone
show	showed	shown
shrink	shrank	shrunk
shut	shut	shut
sing	sang	sung
sink	sank	sunk
sit	sat	sat
sleep	slept	slept
slide	slid	slid
speak	spoke	spoken
spend	spent	spent
spin	spun	spun
stand	stood	stood
steal	stole	stolen
stick	stuck	stuck
sting	stung	stung
stink	stank	stunk
strike	struck	struck
swear	swore	sworn
sweep	swept	swept
swim	swam	swum
swing	swung	swung
take	took	taken
teach	taught	taught
tear	tore	torn
tell	told	told
think	thought	thought
throw	threw	thrown
understand	understood	understood
wake	woke	woken
wear	wore	worn
weave	wove	woven
win	won	won
write	wrote	written

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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.
break up	end a relationship	Did you hear that Lara and Renato **broke up**?
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.

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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 dog **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.

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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.
break up with	end a relationship	She **broke up with** her boyfriend last week.
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.

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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 rock star, 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 pop stars.
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 agree appear arrange attempt care claim decide demand deserve fail happen hesitate hope intend learn manage offer plan pretend refuse seem tend vow wait	ask choose dare expect need prepare promise want wish would like	cause challenge convince empower forbid force hire invite motivate order persuade remind tell urge warn

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 allow encourage permit require	admit anticipate appreciate avoid can't help carry on consider delay deny discuss dislike enjoy feel like finish imagine involve justify keep look forward to mention mind miss postpone practise put off recommend report resist risk suggest understand

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 can't bear can't stand continue hate like love prefer propose start	forget go on quit regret remember stop try

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Start



Contrast two of your teachers.

You're lucky! Move ahead 2 spaces.

Compare



Contrast two favourite TV characters.

You're stubborn! Move back 1 space.

Compare yourself and your best friend.



You're energetic! Move ahead 2 spaces.



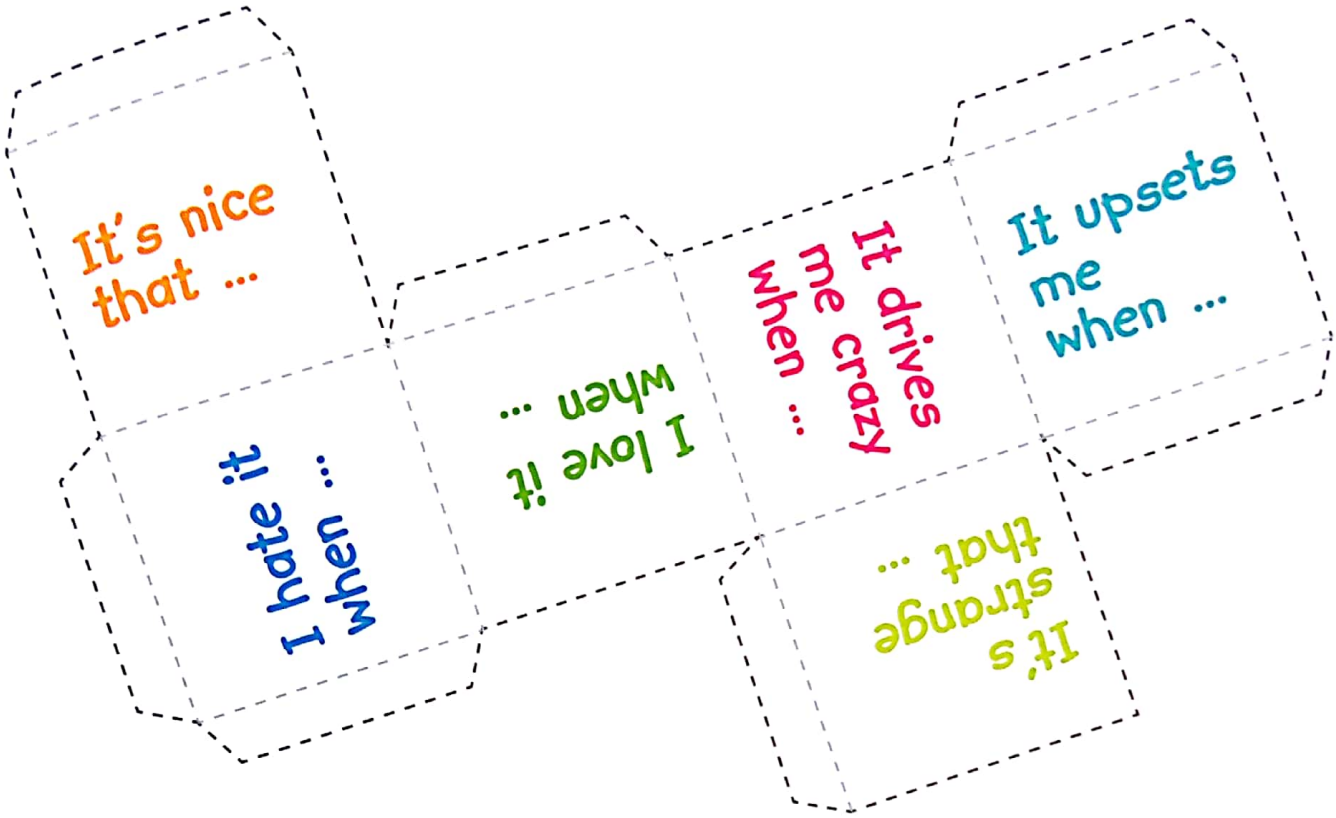
Compare yourself and a brother, sister or cousin.

Congratulations! **You've finished!**

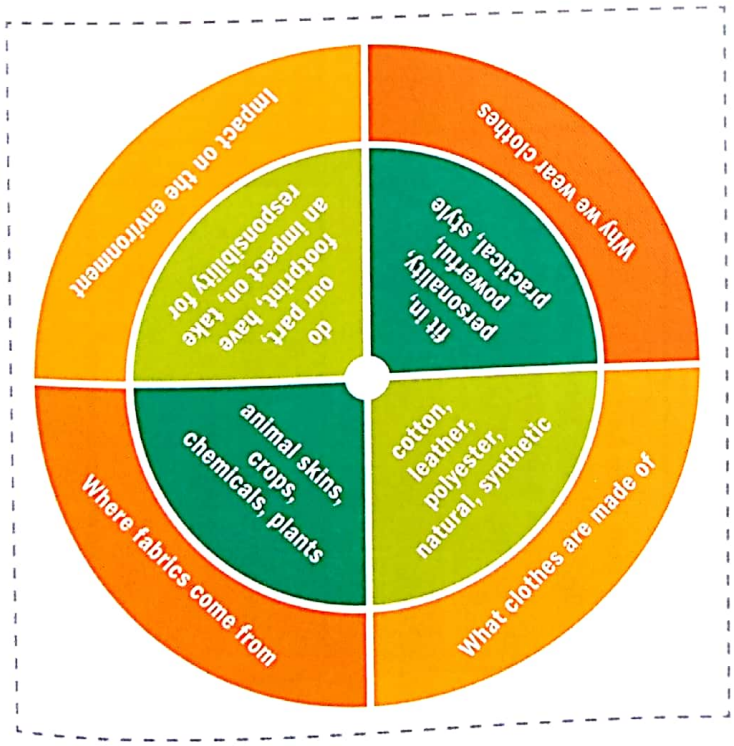
End

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Unit 1 Cutouts Use with Activity 4 on page 20.



Unit 4 Cutouts Use with Activity 3 on page 63.



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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

Rats clean themselves frequently. They even wash their faces with water.

true

Hippos sweat a red-pink version of blood.

false

The giant Goliath bird-eater spider can cover the head of a man.

true

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Start

Make a sentence about army ants.
Use: **Because of**

Make a sentence about elephant group behaviour.
Use: **Since**

You're unlucky!
Move back 1 space.

Make a sentence about yourself.
Use: **As a result**

You're lucky!
Move forward 3 spaces.

Make a sentence about yourself and a friend.
Use: **So**

Make a sentence about bees and wasps.
Use: **Consequently**

Make a sentence about groups of birds flying together.
Use: **Due to**

Make a sentence about schools of fish and predators.
Use: **As a result**

You're unlucky!
Move back 1 space.

Make a sentence about yourself.
Use: **Because**

Make a sentence about mosquitoes.
Use: **Due to**

End

Make a sentence about cockroaches.
Use: **So**

Make a sentence about yourself and a family member.
Use: **Since**

Make a sentence about monkeys.
Use: **Because of**

You're unlucky!
Move back 1 space.

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START

Your friend bought another pair of trainers – for a total of €25.



Your little brother always takes your favourite hat without asking.

You have a small fashion footprint!

Advance 2 spaces.



Your sister washed your favourite white dress with a load of black clothes.

Your friend borrowed your new jeans without asking.

Your brother got chocolate ice cream all over your favourite shirt.

You don't think before you buy!

Go back 2 spaces.

Your dad throws out old ties he doesn't wear any more.



You do your part to protect the planet.

Advance 2 spaces.

Your aunt isn't interested in reducing her fashion footprint.

A classmate forgot to collect clothes for the recycling party.

You don't recycle old clothing!

Go back 2 spaces.

FINISH

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Insects evolved from ancient animals that lived in water.

Argue YES or NO.

Bats evolved from large dinosaurs that lived on the ground.

Argue YES or NO.

Birth order is the best way to understand your personality.

Argue YES or NO.

Pterosaurs were too big to generate powered flight, so they just glided.

Argue YES or NO.

Over millions of years in the future, flight may eventually evolve in humans.

Argue YES or NO.

Feathers appeared before flight and helped control body temperature.

Argue YES or NO.

Contagious behaviour such as yawning can sometimes cross species.

Argue YES or NO.

Flight evolved because it helped creatures find new sources of food and escape predators.

Argue YES or NO.

Cockroaches are as careful about being clean as cats are.

Argue YES or NO.

Hollow bones in pterosaurs and birds reduced weight and supported wings in flight.

Argue YES or NO.

All birds that fly have got wings, but not all birds that have got wings fly.

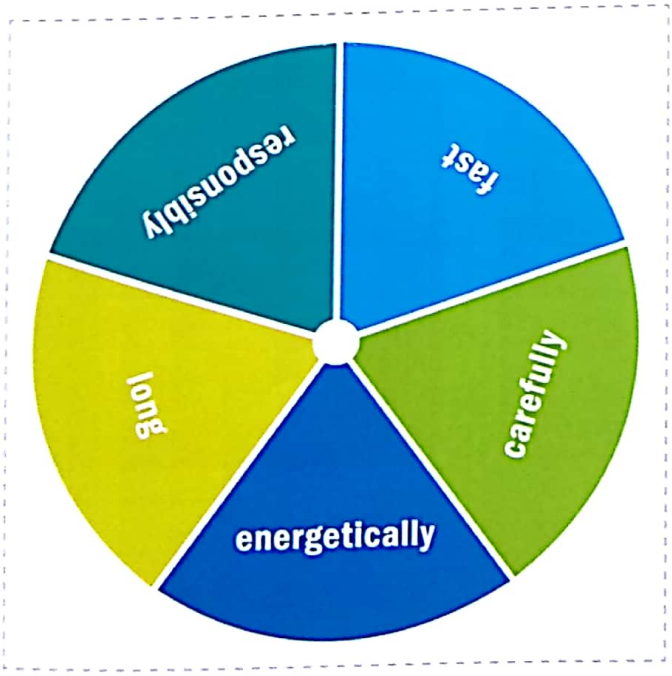
Argue YES or NO.

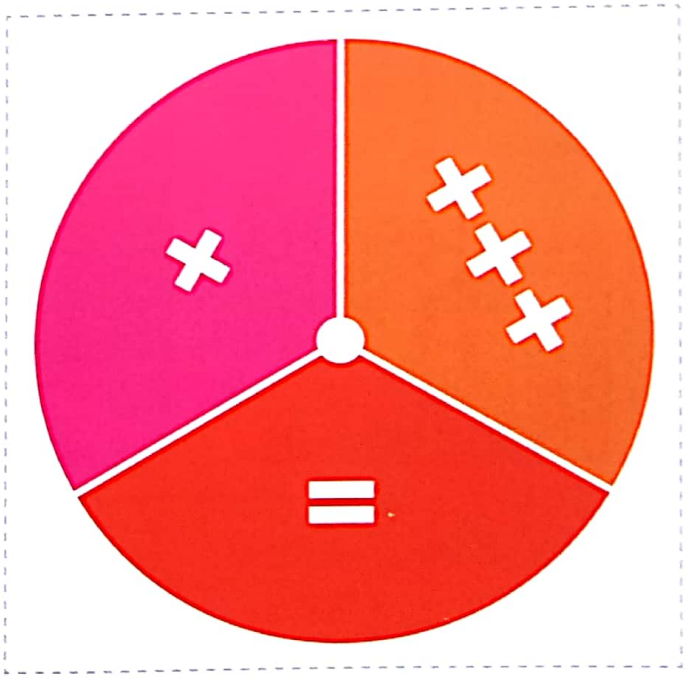
Cotton plants need only small amounts of pesticides, water and energy to produce crops used in clothing.

Argue YES or NO.

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A sand dune on Mars

The surface of Mars, in the Valles Marineris area

Water flowing on Mars

Curiosity Rover exploring Mars

Round balls of minerals found on Mars

An illustration of a dust storm on Mars

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Scanned by CamScanner



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'Can you tell a visual story?'

'Stop reading so many comic books.'

'I will learn to create animations.'

'Ami Vitale tells stories with her photos.'

'I prefer realistic art to abstract art.'

'Do you like manga?'

'Use quality pencils and pens for drawing.'

'Videos are one way to tell a story.'

'Illustrators change their work many times before publishing it.'

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START

How do you feel about opera? Why?

Are DJs original artists? Why or why not?

You're lucky! **Move ahead 1 space.**

Is it good to follow fashion and music trends? Why or why not?

What do you think about playing an instrument?

You're unlucky. **Move back 1 space.**

Do you use art to express yourself? Why or why not?

Describe something you're crazy about and explain why.

You're lucky! **Move ahead 1 space.**

Name something you can't stand and explain why.

What are your thoughts on hip-hop? Why?

What's your favourite form of self-expression? Why?

FINISH

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See an opera singer perform	Feel your heart beat loudly	Your choice! Use *see*, *feel*, *hear* or *watch*.	Watch a DJ spin
See a puppeteer perform	Your choice! Use *see*, *feel*, *hear* or *watch*.	See dancers perform	Hear an orchestra play
Hear actors talk	Feel the floor move	Watch a clown juggle	Your choice! Use *see*, *feel*, *hear* or *watch*.

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