4 Forces of nature

Unit profile

Vocabulary: Natural disasters: verbs
Reading: *Asteroid attack*
Grammar: Making comparisons
Vocabulary: *too*, *so*, *such*
Listening: A news broadcast
Speaking: Discussing options

Warmer

Put students into teams of five or six. Read these questions out loud and ask teams to write down their answers, *a*, *b*, or *c*. Give them a couple of minutes to discuss each question.

1 Which of these produce the fastest winds?
a tornados **b** hurricanes **c** cyclones

2 In which country did the strongest earthquake on record occur?
a Chile **b** Indonesia **c** USA

3 What are your chances of being hit by lightning each year?
a 1 in 7 million **b** 1 in 700,000 **c** 1 in 700

4 How often does lightning occur worldwide?
a 500 to 100 times per day
b 50 to 100 times per hour
c 50 to 100 times per second

Answers

1 a **2** a **3** b **4** c

Your profile

Monitor as students discuss the questions in pairs. When feeding back on the second question, ask students if they know which country has the most cyclones (*Philippines*), active volcanoes (*Indonesia*), and earthquakes (*countries around the Pacific rim*, *e.g. Japan*, *Indonesia*, *New Zealand and the US west coast*).

VOCABULARY Natural disasters: verbs

1 1.11 Put students into pairs to describe what they can see in the photos. Then tell them to do the matching exercise individually. Remind them that they only need to match three of the four photos. Play the recording and check answers. Check understanding of the verbs in bold. You could put students into groups of four and ask each student to check the meaning of two or three words in a dictionary. They then teach their words to their group. Feed back as a class (*shake: make quick short movements from side to side; collapse: when a building suddenly falls; crack: when thin lines appear on the surface of a building; erupt: when a volcano suddenly throws out smoke*, *fire and molten rock; run: flow; float: move through the air; knock over: hit something and make it fall down; smash: break into lots of pieces with a loud noise; drag*: *pull something slowly*).

Answers

1 c (earthquake) **2** b (volcano) **3** a (tsunami)

Audioscript

Narrator: One
Speaker 1: We go now to our reporter at the scene …
Speaker 2: Apparently the earthquake measured five on the Richter scale. The ground was shaking violently and the roads have cracked in places, but we're in an earthquake zone here, so luckily no buildings have collapsed. The buildings here are built to withstand shocks of at least five point five on the Richter scale. The problem now is getting emergency food and water supplies to the region. The roads and the airport will be out of action for some time to come …
Narrator: Two
So we're flying now over the affected area and in the distance I can just about make out the volcano itself. The volcano has been erupting for about two days now, and we can see a huge cloud of thick, grey dust floating away from the top of the volcano. The worry of course for anyone living near the volcano is not the red river of lava – this boiling-hot liquid rock – that is running down the side of the volcano. No, the real danger is the effect of breathing the toxic gases that can blow in the wind many kilometres from the actual volcano. For us up here in this helicopter there should be no real danger, but it is now known that the tiny particles in the clouds of dust can cause jet engines to break down within just a few minutes, which is why jet planes never fly through areas where a volcano is erupting.
Narrator: Three
Speaker 1: This is where the tsunami happened about ten years ago. Don't worry, we should be safe now. There's a tsunami warning system in place all the way along this coast, but in those days there was no warning at all.
Speaker 2: What causes tsunamis, exactly?
Speaker 1: Sudden earth movements on the bottom of the ocean …
Speaker 2: You mean, like an underwater earthquake?
Speaker 1: Yes. Or they can be triggered by a large landslide into the sea, or even an underwater volcano. Any large, violent movement like this can cause massive waves that get bigger the closer they get to land. A really big tsunami can reach ten or twenty metres in height before it crashes into the shore and knocks over trees and smashes buildings. Coastal areas then tend to flood and when the water flows back out to sea, it drags everything with it. So tree trunks, vehicles, parts of buildings – all sorts of things get dragged out to sea.

2 1.12 Put students into same-ability pairs to describe what has happened. Play the recording for them to check their answers.

Audioscript

Speaker 1: Watch out!
Speaker 2: Wow – a landslide! They warned about them on the radio.
Speaker 1: I've never heard of landslides happening around here!
Speaker 2: Well, there's been a lot of rain this winter, and so on some of these steep slopes without any trees, big piles of mud and rocks can suddenly break away and slide down.
Speaker 1: What difference do trees make?
Speaker 2: Tree roots tend to hold the rocks and soil together, and stop landslides from starting. And if there is a landslide further up a slope, trees can slow or stop it by catching a lot of the loose mud and rocks on their branches.
Speaker 1: We should turn back.
Speaker 2: Sure.

3 Put students into pairs to describe the other natural disasters. Encourage them to use as many of the verbs as possible from exercise 1. During feedback, ask students how many of the verbs they used. Get the pair that used the most verbs to describe a natural disaster to the class.

READING

1 Elicit what students know about asteroid attacks. Then give them just one minute to quickly read through the text to practise skimming for the main idea. Check answers. Ask students to identify any parts of the text that helped them identify the answer, i.e. paragraph 2 and paragraph 4.

Answer

b

2 Tell students to work in groups of four. Each student should find the answer to one question and then discuss the questions as a group. Check answers.

Possible answers

1 He is probably an amateur astronomer.
2 Telescopes belonging to government agencies and other astronomers.
3 Destroying an asteroid with an explosion is instant, but there is a risk of lots of smaller rocks hitting Earth.
4 They are not dangerous, as they are extremely unlikely to affect the average person.

3 Go through the exercise and elicit the types of information students are looking for. For number 1 they will need to look for measurements, for 2 they will need to look for dates, for 3 they will need to look for place names, and for 4 they will need to look for nouns and verbs describing the effects. Give students a few minutes to answer the questions individually. Allow them to compare their answers with a partner before checking as a class.

Fast finishers

Ask fast finishers to think about asteroid attacks in comparison to the other natural disasters in the Vocabulary section. Do they think they are more or less of a concern than the others, and why? Elicit some ideas after checking answers to exercise 3.

Answers

size	when	where	effects
10 km across	65 million years ago	Mexico	killed much of the plant and animal life on Earth, including the dinosaurs
50–100 m across	1908	Tunguska, Russia	destroyed 80 million trees, knocked over people 60 km away
17 m across	2013	Chelyabinsk, Russia	smashed glass and damaged buildings
30 m across	2013	27,700 km from Earth	none

4 Elicit adjectives that mean *extremely big* and write them on the board. Ask students to see if their ideas are mentioned in the text and to find any other synonyms. Check answers.

Mixed ability

Tell weaker students the words they are looking for (see Answers) and ask them to find them in the text.

Extension activity

Put students into pairs to make a list of adjectives which mean *very small*. Set a one-minute time limit and do not allow dictionaries. Find out which pair has the longest list and ask them to read it out loud. See if other students can add anything else to the list. Possible adjectives include *microscopic*, *miniature*, *minuscule*, *mini*, *minute*, *teeny*, *tiny*.

Answers

paragraph 3: massive
paragraph 4: huge
paragraph 5: giant
paragraph 6: major
paragraph 7: vast

Talking points

Monitor as students discuss the questions in small groups. You could also ask them to talk about any disaster movies or TV programmes they have seen.

EP Word profile

Books closed. Write *term* on the board and tell students to write an example sentence using it. Books open. Ask students to compare their sentence with the ones in the book, and to identify any with a similar meaning and use. Set the exercise on page 123. Check answers.

Answers
1 term **2** in the long term **3** in terms of **4** terms
5 in the short term

Cooler

Put students into small groups. Tell them that it has been announced that an asteroid will soon strike near their home, and that they are leaving town by car. They see four people standing on the side of the road and they have space in their car to take one of them. The people are their best friend, their favourite singer, their brother/sister and their teacher. Together they should decide who to take and why. Ask one or two groups to share their choice and reasons with the class.

GRAMMAR Making comparisons

1 Books closed. Write *less*, *slightly*, *almost*, *very*, *a lot*, *a good deal* on the board. Put students into pairs to make an example sentence using each word. Set a time limit of three minutes and see which pair can get the most correct sentences. Books open. Ask students to compare their ideas with the book and to complete the rules. Check answers.

→ **Grammar reference Student's Book page 141**

Answers
b almost **c** good, far **d** easily **e** quite

2 Tell students to look at the rules again and to find one which describes a small difference and one which describes a big difference. Then ask them to complete the exercise individually before checking answers as a class.

Answers
1 a, b, e **2** c, d, f

3 Books closed. Put students into teams of four and ask the following questions: *Which continent is the largest? Which is bigger, Australia or Europe? Which place on the Earth is the coldest? What is the second tallest mountain? Where is the driest place on Earth?* Books open. Tell students to compare their answers to the sentences in the book and to work in pairs to choose the correct words. Check answers.

Answers
1 easily **2** as big as **3** good deal **4** higher
5 the more you have to drink

4 Tell students to complete the gaps individually and then compare their ideas with a partner. Check answers. Ask them to write their own sentences using the phrases. These can be about bands, TV shows and sports teams, for example.

Mixed ability

Put weaker students into pairs to complete the sentences in exercise 4.

Fast finishers

Ask fast finishers to write sentences comparing geographical features, such as rivers or mountains, in their own country or a country they know well. Elicit some example sentences after checking answers to exercise 4.

Answers
1 by far the strongest **2** bigger than **3** powerful than
4 a lot less harmful **5** the smaller **6** almost as active as

5 Do the first sentence as an example on the board. Monitor and help as students write the sentences using the prompts. Check answers. Ask students if any of the information on page 120 surprised them.

Answers
1 Dry Valleys is drier than the Sahara Desert and the Atacama Desert.
2 The Red Sea is smaller than the Pacific Ocean.
3 Tokyo is bigger than São Paulo and New York.
4 The River Amazon is longer than the River Thames.

Corpus challenge

Put students into small groups. Ask the students to think of as many adjectives as possible where the comparative is formed by adding *more*. Give students one minute and then find out which group has the most. Elicit and check the group's list. Finally, set the task in the book.

Answer
I think that my town will be bigger in 20 years' time.

VOCABULARY *too, so, such*

1 Write the words *too*, *so* and *such* on the board. Mime the following sentences: *It's too heavy, It's so tasty, This is such a boring book.* Ask students to use *too*, *so* and *such* to say what you are miming. Nominate a stronger student to explain the difference in meaning between *too*, *so* and *such* (*too* means more than is necessary, allowed, etc.; *so* emphasises what you are saying; *such* emphasises a quality of someone or something). Tell students to complete the gaps before checking their answers in the article on page 25.

Answers

1 such a powerful explosion that **2** far too risky to
3 too many smaller rocks **4** so slow that **5** so vital that

2 Do the first sentence as an example before asking students to complete the exercise individually. Allow them to compare their answers with a partner. Nominate a student to give the answer to question 2 and tell them to nominate another student to answer question 3, and so on.

Extension activity

Tell students to use *too*, *so* and *such* to describe their life at the moment. They could write about friends, social life, school, etc. Put students into pairs to share their sentences and to ask and answer questions about each sentence to find out more. Nominate individuals to tell the class about their partner.

Answers

1 so hard that **2** too much money
3 such a boring book **4** too hot **5** too many films
6 so much help

LISTENING

1 Ask the question to the whole class and elicit some ideas. Find out what students think is going on in each picture and whether they have seen such images before. If so, find out what they know about these events.

2 **1.13** Explain to the class that they are going to listen to a news broadcast about the events in the photos. You may need to explain *urban* (*relating to a town or city*), *burst* (*break suddenly*) and *soil* (*the top layer of earth*). Play the recording for them to check their answers to exercise 1.

Answers

A *sinkhole* is a hole in the ground caused by a collapse of the top layer of earth.

Audioscript

Reporter: A New York street was closed last night after a massive sinkhole opened up – right in the middle of the street. The hole, which measures seven metres across, appeared suddenly at around 11 pm local time. Our reporter Mike Williams is at the scene.
Mike: Hi, Fiona, yes, as you said, the road has been closed to traffic as well as pedestrians so it's fairly quiet here now. No one was injured when the sinkhole appeared but a few parked cars nearly fell into it, and the police and fire service immediately closed the area. Local residents have been taken to a nearby sports centre where meals and emergency beds are being provided.
Reporter: Mike, tell us a bit more about sinkholes. I mean, they aren't something you hear about every day, are they?
Mike: Well, here in the States they are fairly common, actually, especially in Florida, but here in New York City? No, this is a first.
Reporter: And what is a sinkhole exactly?
Mike: A sinkhole is when the ground collapses into a hole or a cave that has formed below the surface. There's usually nothing to see on the surface until all of a sudden, the ground over the top of the cave collapses.
Reporter: And what causes them?
Mike: They're either caused when drains and water pipes under a city burst, and the water washes away any soft soil under the ground. Or they can be the result of natural processes like underground streams and erosion from rainwater after a big storm.
Reporter: Can sinkholes occur anywhere?
Mike: Well, they're much more likely to occur in the countryside than in a city, simply because the vast majority of the earth's surface is rural, rather than urban. In the US, famers in Florida do sometimes find sinkholes on their land, but these are largely unreported of course.
Reporter: How can you tell if a sinkhole is likely to happen?
Mike: Often there aren't any warning signs, particularly in the open countryside, though you might notice cracks in the ground or small holes. In cities, look out for walls that are cracking, or for doors and windows that all of a sudden don't shut properly.
Reporter: Is it something people should be worried about?
Mike: No. Sinkholes are still very rare and when they do occur, even though they look really dramatic, few people have ever been injured by a sinkhole. I mean just a few years ago in Florida, a thirty-metre sinkhole appeared underneath a hotel. Again, no one was injured but hundreds of guests had to be moved to safety.
Reporter: What is the biggest sinkhole ever recorded?
Mike: There was one in 2007 in Guatemala …
Reporter: Guatemala?
Mike: Yes, it was in a suburb of Guatemala City. It was one hundred metres deep! The aerial photos are incredible – it's almost perfectly circular.

3 **1.13** Ask students to read the sentences. Then tell them to write *True* or *False* next to each one from what they remember. Play the recording again for them to check their answers. Nominate stronger students to explain why the false sentences are incorrect, and see if the rest of the class agrees.

Answers

1 False – It measured seven metres across.
2 False – Some parked cars nearly fell into the sinkhole.
3 True
4 True
5 True
6 False – The warning signs are when walls crack or when doors and windows are hard to open and close.
7 False – No one was injured, but hundreds of guests had to leave the area.
8 True

SPEAKING Discussing options

1 Put students into pairs to do the exercise. Check answers. Find out if anyone has been camping, and if so, which items from the survival kit they took with them and why.

2 **1.14** Read the instructions aloud. Elicit what type of language they might hear for each one, e.g. 1 and 2 could have expressions such as *It's a…*, *It's used for…*, *You need it to…*, *You can use it for*…, and 3 is likely to use a lot of comparative and superlative structures. Play the recording for students to answer the question, and check answers.

Answers
2 and 3

Audioscript
Ellie: I guess the torch would be really useful.
Luke: Not as useful as a first aid kit or drinking water! You might die without those two.
Ellie: Yes, a first aid kit and water are very important, especially water, but bear in mind that there might not be any power after something like a flood or an earthquake, so a torch is essential.
Luke: True. There are some face masks here. I could do without a face mask. You can always wet a T-shirt and tie it around your face if you have to.
Ellie: That's assuming you have enough water. What if there's no tap water? I think a big container of water for washing and cooking would be quite useful. If you think about it, you use running water all the time.
Luke: All right. It gets cold at night so you'd need blankets or something to sleep in, and with no roof over your head, waterproof clothing would be sensible.
Ellie: But not that important. What about food? There are some cans of food here. They'd be useful.
Luke: Yes. After a disaster, I'd be grateful for any kind of food!
Ellie: OK. So would we need something to cook with – and a can opener?
Luke: Maybe. What about a sharp knife?
Ellie: Yes. It seems pretty obvious that a knife would be useful for cutting up food and all sorts of other things.
Luke: But Ellie, we can only choose three.
Ellie: OK. So, which three are vital?
Luke: Surely drinking water is by far the most essential one?
Ellie: Yes. And what else? I'd have thought that the torch would be lot more useful than the knife.
Luke: Because you need to be able to see after dark? OK.
Ellie: Right. Drinking water, torch, and …
Luke: Well, I vote for food!
Ellie: OK. So we'd take drinking water, a torch, and canned food.
Luke: Yes. We might get cold or wet, but at least we'd eat well!

3 **1.14** Ask students to read the *Prepare* box. Explain that they need to tick the expressions they hear. Play the recording again and check answers.

Answers
Bear in mind that …
What if there's no …
If you think about it …
Surely … is by far the most essential one?
I'd have thought that …
It seems pretty obvious that …

4 The exercise is related to *First* Speaking Part 3, in which students are asked to discuss a topic in pairs or a group of three. Put students into small groups to discuss question 1. Monitor and give positive feedback for interesting ideas. For question 2, tell students to work individually and write down the five things they think are most important. Then put them into pairs to compare their lists and choose the three most important things. Put pairs together to make groups of four and give them a few minutes to decide especially water,on the most important thing to take. Ask each group to feed back to the class, and hold a discussion to see if everyone can agree on the single most important item.

Cooler
Put students into pairs to discuss these questions:
1 What natural disasters are most common in your country? How does your government deal with them?
2 How else does the climate or geography of your country affect people's lives?

Share ideas as a class.

Project
Ask students to use the internet to research how some countries try to prevent damage from natural disasters and to find out about charities and organisations that provide disaster relief. What type of things do they provide after a disaster? Tell students to write a blog post called 'Living with and preventing natural disasters'. These can either be posted on the class blog, or displayed around the classroom for other students to read.

Teacher's resources
Student's Book
Grammar reference and practice page 141
Vocabulary list page 130
Video
Extreme weather
Workbook
Unit 4, page 16
Go online for
- Pronunciation
- Progress test
- Achievement test
- Video extra worksheet
- Corpus tasks

Geography
Climate zones

Learning objectives
- The students learn about the impact of different climate systems around the world.
- In the project stage, students write a Geography report about a city, including a climate chart similar to the one from the reading section.

Warmer
1 Put students into pairs. Tell them to write the letters A–Z down one side of a piece of paper.

2 Tell students they have two minutes to think of a country for as many of the letters as possible, e.g. *Australia*, *Belgium*, *Canada*.

3 After two minutes, find out how many items students have, and get the pair with the most to read theirs out. Ask other groups if they have any items for any letters this group didn't have.

4 Tell students to put the countries into groups. Allow them to group them however they want, e.g. by continent, English-speaking countries, places they would or would not like to visit. Elicit some of the groupings in whole-class feedback.

1 Tell students to look at the map and to read the text to find out about the climate zones. Explain that the alpine climate is also known as a mountainous climate and that the arid climate is also known as a desert climate. Ask students to list places they might find alpine or arid zones in. As an alternative, divide the class into two groups. Set a one-minute time limit for one group to list the alpine zones and the other to list the arid zones. Feed back as a class. If you did the Warmer, you could use your list on the board to elicit some examples.

Possible answers
Alpine zones: the Alps, the Andes, the Himalayas
Arid zones: the Sahara Desert, Australia, northern Mexico

2 Ask students to do the matching exercise individually before comparing their ideas in pairs. Check answers.

Answers
1 tropical **2** polar; alpine **3** arid **4** temperate

3 Put students into pairs to describe what they can see in the photos. Find out if they already know anything about Tivoli, Nuuk or Belém and discuss what they know as a class. Then ask them to match the texts to the photos in pairs. Check answers.

Extension activity
Ask students to underline all of the vocabulary associated with temperature and weather in the text. Tell them to think of a country and to write two sentences describing its weather and two sentences giving other facts about the country. Put students into small groups and tell them to read their sentences out loud. The rest of their group should try to guess the country. Each group should choose one of their countries to test the whole class on.

Answers
a Nuuk **b** Belém **c** Tivoli

4 Ask students to read the texts again and to answer questions 1 to 3 individually. Nominate individuals to give answers and check the rest of the class agrees before confirming. Put students into same-ability pairs to discuss questions 4 and 5. Monitor and join in, helping with vocabulary as necessary. Give positive feedback for interesting ideas, and share ideas as a class.

Answers
1 Nuuk. The climate means that agriculture is limited, so the economy depends on fishing, mining and transport.
2 Tivoli. The climate is excellent for many crops.
3 Belém. Vegetation is thick and fast-growing.
4 and **5** Students' own answers.

5 Elicit what students already know about Edinburgh (it is the capital of Scotland, famous for its historic buildings and the Edinburgh Festival). Ask them if they know what the weather is like there. Elicit ideas and then ask them to complete the sentences with the words in the box. If they need help, tell them that the first four sentences are each completed with the name of a month, the second four with a comparative adjective.

Fast finishers

Ask fast finishers to use the words in the box to write three sentences about their own country's climate. They can share these after checking answers to exercise 5.

Answers

1 July **2** September **3** February and December
4 April **5** higher **6** wetter **7** lower **8** drier

6 **1.15** Tell students that they are going to find out more about Edinburgh and its geography. Give them a couple of minutes to read the questions. You may need to explain *record* /ˈrek.ɔːd/ – here, the lowest temperature ever recorded. Play the recording. Allow students to compare their answers with a partner before checking as a class.

Answers

1 It's near the sea so it has a temperate climate.
2 14.6 degrees below zero
3 1400 annually
4 July and August
5 in the morning
6 warm clothing and an umbrella

Audioscript

The city of Edinburgh is on the River Forth, in the Scottish Lowlands, not far from the North Sea. Because of its location near the sea, Edinburgh has a temperate climate. The weather is milder than in other cities at the same latitude, such as Moscow, which has much colder temperatures.

The average annual temperature in Edinburgh is nine degrees. In summer, it's usually about eighteen to twenty degrees, although the record high is thirty one point four. In winter, the temperature usually stays above freezing, or zero degrees, although the record low is fourteen point six degrees below zero. Edinburgh receives a good amount of precipitation – about seven hundred millimetres per year – and it rains every month of the year. However, the city does get quite a bit of sunshine – about one thousand four hundred hours annually. The sunniest and warmest months are July and August, when Edinburgh's most famous festivals take place: the Edinburgh International Festival, and the Edinburgh Fringe.

Edinburgh is also known for its windy weather, and it can be quite foggy as well, especially in the morning, although the fog often disappears by midday. That's another interesting characteristic of Edinburgh's weather – it's quite changeable. People say that you can experience all four seasons of the year in a single day. As a result, people there often carry warm clothing and an umbrella with them, in case the weather suddenly turns cold or wet.

Cooler

Put students into small teams and tell them to write five geography questions, e.g. *What's the capital city of Estonia?* (*Tallinn*) Remind them that they need to know the answers to their questions. Once groups have written their questions, each team should ask their questions to the class. The other teams should write down the answers. Check answers after each group has read out their questions. The winning team is the one with the most correct answers.

Mixed ability

Challenge stronger students to research, write and present their projects individually.

Project

This project can be done in class if you have internet access or set as homework. Put students into small groups to complete the research. Then tell them to write a report to present in the following class. This could be done as a PowerPoint presentation. Encourage the rest of the class to ask questions after each group has finished.