

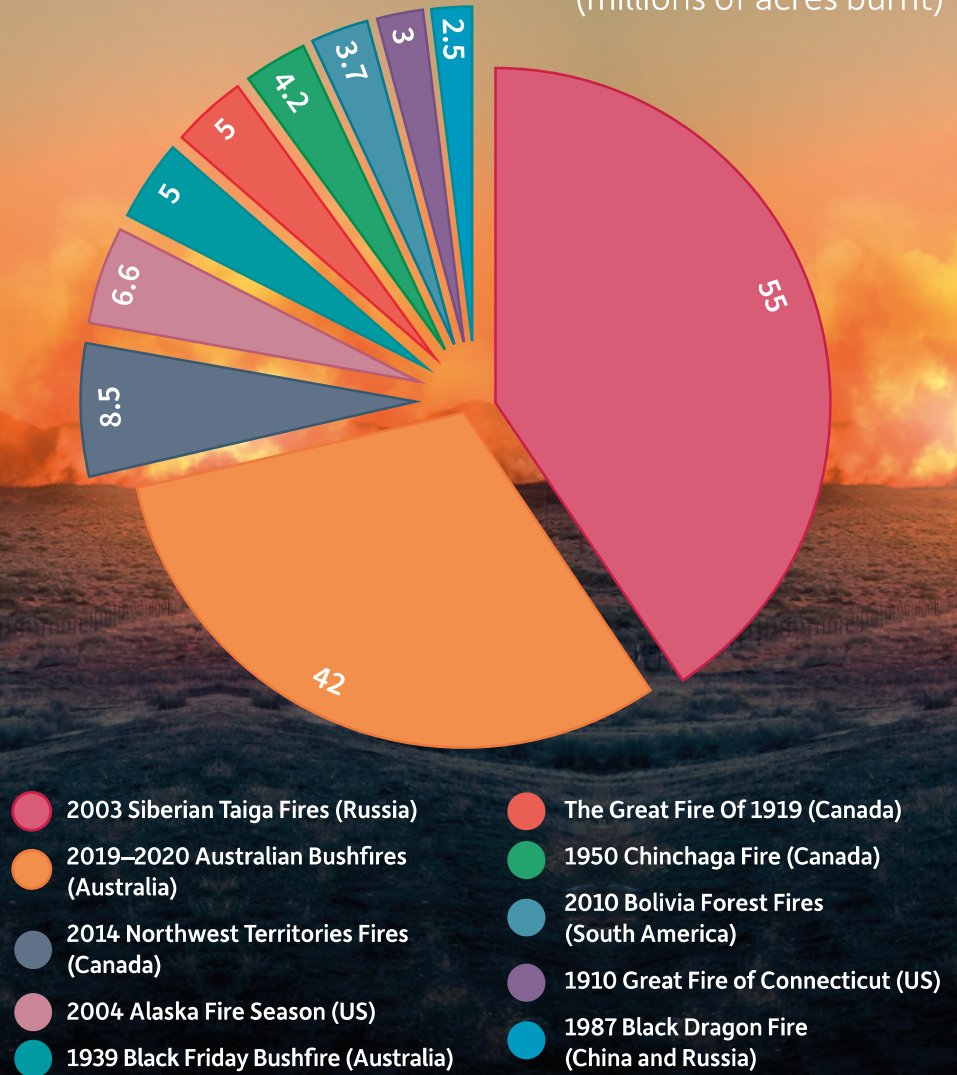
4 Fire

DISCUSSION POINT

Discuss with a partner.

- 1 What does the pie chart show you about the damage caused by wildfires?
Over time, the amount of damage is ...
- 2 Why are some parts of the world more affected than others?
There might be a variety of reasons such as ...
- 3 What can the authorities and the public do to prevent wildfires?
I think the only people who can really prevent fires are ...

MOST DAMAGING WILDFIRES (millions of acres burnt)



▶ VIDEO

BEFORE YOU WATCH

Match the words in bold with the correct definitions.

- | | |
|--------------------------|---|
| 1 cause (v) | a the bright, burning gas coming from a fire |
| 2 destruction (n) | b a nervous feeling that bad things might happen |
| 3 flames (n) | c to make something happen, usually something bad or unpleasant |
| 4 phenomenon (n) | d damage that is so bad that something stops existing or can never return to normal |
| 5 uncertainty (n) | e an event or situation that can be seen to happen or exist |

UNIT AIMS

READING 1 Using word parts to understand meaning
READING 2 Recognizing adverbs to identify point of view
ACADEMIC SKILL Active reading with SQ3R

VOCABULARY Vocabulary for talking about wildfires
GRAMMAR Gerunds and reduced clauses
WRITING Supporting your arguments



Ambulances drive towards a wildfire.

WHILE YOU WATCH

Watch the video. Choose the correct answer.

- 1 Close to **three quarters** / **one half** of the town of Greenville was destroyed by the Dixie Fire.
- 2 There are people in the town who have been **warned** / **evacuated** many times in a short period.
- 3 The community is providing food and **support** / **jobs** to those affected by the fire.
- 4 At the end of the video, the woman explains that the fires and climate change in general are a matter of **belief** / **science**.

AFTER YOU WATCH

Work with a partner. Discuss the questions.

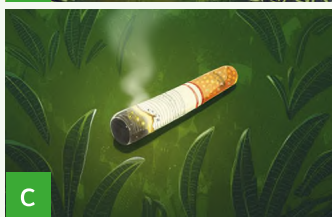
- 1 What measures should people in towns like Greenville take to reduce the risk of fire?
They should ...
- 2 What are the main environmental threats in your country?
I think the main threats are ... because ...
- 3 What can you do to help protect the environment in your country?
We should ...



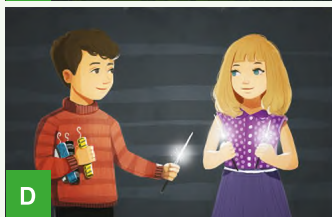
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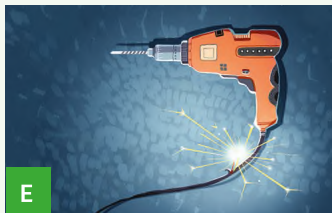
B



C



D



E

Activating prior knowledge

Reading for tone

THE TOP FIVE CAUSES OF WILDFIRES

A VOCABULARY PREVIEW

1 Match the images A–E to the sentences 1–5.

- Any activities involving young people and fire should be **supervised**. ____
- Authorities should **enforce** laws controlling the use of domestic fires to burn or **melt** trash. ____
- Campfires in the **wilderness** or in **rural** areas should never be left unattended. ____
- Laws stopping people from throwing burning cigarettes would be **beneficial** in the prevention of wildfires. ____
- Electrical equipment requires regular **maintenance** or repair can be **costly** and equipment can release sparks and start fires. ____

2 Match the words in bold from Exercise 1 to the definitions.

- _____ (adj) costing a lot of money
- _____ (adj) with a good effect on someone or something
- _____ (v) to change something solid into a liquid
- _____ (v) to make sure a law is obeyed
- _____ (adj) in the countryside
- _____ (n) an area of land without buildings where no one lives or grows crops
- _____ (n) work done to keep something in good condition
- _____ (v) to check that people are behaving correctly

B BEFORE YOU READ

The reading discusses the following five causes of wildfires. Predict how common they are by ranking the causes from 5 (least common) to 1 (most common).

- | | | |
|-----------------------------|---------------------------|----------------|
| ___ Backyard burning | ___ Unattended campfires | ___ Cigarettes |
| ___ Unsupervised activities | ___ Sparks from equipment | |

C GLOBAL READING

Read *The top five causes of wildfires*. Answer the questions.

- Is the main purpose of the reading to entertain or to inform people?
- Is this reading written for the general public or Forest Service employees?
- Which parts of the reading have an informal tone and which are formal?

The top five causes of wildfires

- 1 How is it, that if you drop a cigarette in a wet forest it starts a fire by accident, but when you're camping and trying to set a fire on purpose, with dry wood and plenty of matches, you can't do it?
- 2 Personal fire-making skills aside, the causes of wildfires—defined as large, rapidly spreading fires especially in rural areas—are worth understanding. If we know what causes fires, we can work to prepare for them, and hopefully, prevent them.
- 3 Wildfires are both destructive and costly—and they're getting worse. Over the past few years, the number of wildfires has increased around the world, especially in countries with large forests such as Russia and Canada. One country in particular that is facing wildfire problems is the United States. In fact, every state in the western United States has seen an increase in the number of wildfires. They occur up to five times more often than 10 or 20 years ago. The fires burn for longer, too, and last nearly five times as long, and cover six times as much land. In 2015, more than ten million acres of land burned—an area about the size of the entire country of Switzerland. The amount of money spent to put out these fires is climbing to two billion dollars a year.
- 4 What's causing this? Fires have to be started by a trigger—that is, something that begins the fire. This can be by humans, either on purpose or by accident, or something natural, such as by lightning. But events like these have always happened. Why are they leading to more fires now?
- 5 The main answer is global warming, a gradual heating of the planet. This affects forests in several ways. First of all, a warmer climate means a drier climate because more water evaporates. Snow in mountain areas melts earlier, so the ground is drier for a longer period of time. Together, these factors increase the risk of a chance spark growing into a wildfire. Furthermore, when fires start, because the ground is drier, they burn hotter, spread faster, and last longer. And they're more difficult to contain or extinguish. Wildfires in large forests can burn for several months.
- 6 Climate change affects fires in other ways too. When the balance of nature in a forest changes, trees become weak or sick. Insects and other animals damage the weakened trees, which can die, and dead trees become a fuel source for fires. Lightning strikes the earth more than 100,000 times a day, and 10–20% of these events are capable of starting a fire. It's clear that steps need to be taken to reduce this risk.
- 7 However, about 90% of all wildfires are started by humans. In theory, it should be easier to reduce this number than the number of lightning strikes. Let's take a closer look at some of the causes.
- 8 The fifth most common cause of wildfires started by humans is backyard burning—fires that people set to burn garden waste or trash. These fires may be set following local laws, but then grow too large, are spread by wind, or are not put out correctly. Local laws need to be clarified and properly enforced to reduce risky behavior.
- 9 The fourth most common cause is sparks from equipment such as cars, trucks, or farm machinery. Proper maintenance is essential to stop machines from starting a fire.
- 10 Cigarettes are the third leading cause of wildfires. Education campaigns that teach fire safety are a good way to address this problem.
- 11 Second is unsupervised activities, such as children playing with matches or people setting off fireworks. Education is important but not sufficient in the case of young children. They need to be supervised at all times by parents or other adults and kept away from fuel and things that start fires.
- 12 And first? The main cause of human-caused wildfires is campfires that are either not in a safe area, get out of control, or aren't put out properly. Campers and outdoor enthusiasts need to learn where and when it is safe to build a campfire and how to make sure the fire is completely out before they leave the area.
- 13 It is true that some fires in wilderness areas can have beneficial effects too, such as helping new trees and plants to grow. However, because recent wildfires burn hotter and longer, these effects don't always occur. Instead, we lose land, animal and plant life, and a lot of money. As the earth grows warmer, we need to work harder to protect forests from wildfires.

GLOSSARY

acre (n) a unit for measuring the surface area of land, equal to 4,047 square meters

evaporate (v) if liquid evaporates it changes into gas or steam

sparks (n) a very small piece of burning material

Using word parts to understand meaning

Adjective	Adverb
-al	-ly
-ive	-ward
-y	
Noun	Verb
-ity	-ate
-ment	-ify
-tion	-ize
-ure	

D CLOSE READING

Word parts can be divided into three useful categories, all of which are found in the word *prevention*:

- roots, which show meaning *ven* = come
- prefixes, which modify meaning *pre-* = before; in advance
- suffixes, which show the part of speech *-tion* = noun

Knowing that *pre-* means “in advance” and *ven* means “come” makes it easier to remember that *prevent* means “stopping something in advance before it comes (happens).”

1 Read *The top five causes of wildfires* again. Match words in the text to the roots below. Then write the meaning of the word. Use a dictionary if necessary.

- grad-*, a step (example: *graduate*)
paragraph 5: word: _____ meaning: _____
- cap-*, to take or hold (example: *capacity*)
paragraph 6: word: _____ meaning: _____
- duc-*, to lead or bring (example: *induce*)
paragraph 6: word: _____ meaning: _____
- clar-*, to make clear (example: *declare*)
paragraph 8: word: _____ meaning: _____
- vis-*, see or watch (example: *visual*)
paragraph 11: word: _____ meaning: _____

2 Read the text again and find different forms of the words. Use suffixes from the box to help you.

- The adverb form of *rapid*:
- The adjective form of *destruction*:
- The noun form of *natural*:
- The adjective form of *location*:
- The noun form of *equip*:
- The adjective form of *risk*:
- The adverb form of *proper*:

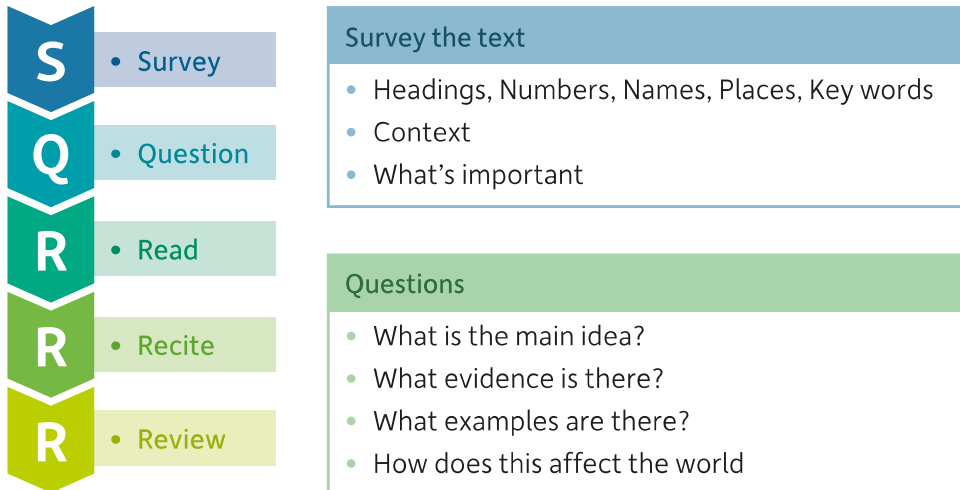
E CRITICAL THINKING

Work in a group. Discuss the questions.

- According to the article, 90% of forest fires are caused by humans. Do you think they all could have been prevented? Why / why not?
- Whose responsibility is it to prevent forest fires: individuals, organizations, or the government?

ACADEMIC SKILLS

ACTIVE READING WITH SQ3R



- 1 Read the *Survey* section of the *Active reading with SQ3R* diagram. Check (✓) the elements you consider when quickly looking at or surveying a text.
- 2 Survey *The top five causes of wildfires* and see which of the elements from Exercise 1 you can find in the text.
- 3 Answer the four questions from the *Question* section for *The top five causes of wildfires*.
- 4 Work with a partner. Discuss the questions.
 - 1 How does answering questions help you understand the text?
 - 2 Which of the four questions most helped you understand the text?
- 5 Work with a partner. Check (✓) which of the following answers would be a good answer to the question *How does this affect the world?*
 - 1 ☐ Knowing what causes fires helps people prevent them.
 - 2 ☐ It is important to know how Americans behave in forests.
 - 3 ☐ Wildfires are becoming a problem for many countries.
 - 4 ☐ People can stay safe if they avoid areas affected by wildfires.
- 6 Work with a partner. Summarise what you learned when you read the text and recite this information to your partner. Use your own words.
- 7 Work with a partner. Review what you and your partner understood from the text by underlining or highlighting any main points.

IS THE CLIMATE CHANGING OUR VIEW OF FIRE?

A VOCABULARY PREVIEW

1 Match the words in bold with the correct definitions.

- | | |
|-----------------------------|---|
| 1 conduct (v) | a to use something for a particular purpose |
| 2 employ (v) | b to put out a fire |
| 3 extinguish (v) | c used for describing an earlier period of time |
| 4 historically (adv) | d used to describe the later part of a period of time |
| 5 latter (adj) | e to do something in an organized way |
| 6 renew (v) | f to replace something that is damaged or old |
| 7 threaten (v) | g to be likely to harm or damage something |
| 8 vegetation (n) | h plants and trees |

2 Replace the words in bold 1–8 with words from Exercise 1. Change the form if necessary.

The use of fire has allowed for huge advances but it has always ¹ **endangered** people, ² **plants** and animals. ³ **Traditionally**, anyone trying to ⁴ **stop** a fire had to ⁵ **use** hand-held objects like buckets of water. This changed after the Great Fire of London in the ⁶ **second** half of the 17th century. Investigations were ⁷ **done** into how to move water across a city quickly and the first fire trucks were created. This ⁸ **restored** trust in fire fighters and they became an important service.

- | | |
|---------|---------|
| 1 _____ | 5 _____ |
| 2 _____ | 6 _____ |
| 3 _____ | 7 _____ |
| 4 _____ | 8 _____ |

B BEFORE YOU READ

Work with a partner. Discuss why you think government authorities might want to set forest fires.

C GLOBAL READING

Skim *Is the climate changing our view of fire?* and answer the questions.

- 1 The main example of how the climate is changing our view of fire is the practice of *controlled burns*. Which paragraph defines this term?
- 2 What is the function of the two paragraphs after the definition?
- 3 What is the function of the final two paragraphs?

Activating prior knowledge

Is the climate changing our view of fire?

- 1** Historically, the deliberate use of fire has long helped civilizations to advance. It allowed the development of farming and technology, which in turn led to the creation of towns and cities. The deliberate use of fire has long helped nature too. By burning away decaying plants and other vegetation, farmers can help healthy plants to grow and renew the land. However, in the latter half of the 20th century, it was clear that as civilizations advanced, they burnt through natural resources and caused climate change. Now, due to climate change, our view of fire may need to change also.
- 2** One example of how climate change has changed opinions towards fire is the Australian wildfires. 2019 was one the hottest and driest years ever recorded in Australia. Many believe that the lack of rain, the dry lands and the increasing heat were some of the main reasons for the wildfires of 2019–2020, otherwise known as Australia's Black Summer. Those terrifying fires destroyed 42 million acres of land and showed the risk of wildfires for people and animals.
- 3** Some of the biggest wildfires ever seen were the Siberian Taiga wildfires in 2003, which destroyed over 55 million acres of land. Again, climate change was a factor, but perhaps a cause just as significant was poor communication from officials about local fires. Burning vegetation on farms or in gardens is so common in Siberia that authorities view fire as a normal part of life and only stop fires that are near populations. One of the reasons the Siberian Taiga fires spread so far might have been because different communities across Siberia were not informed by officials of the number and size of local fires. .
- 4** The clearest need to change our attitude to fire is with the use of “controlled burns”. This practice is often employed by authorities to try and reduce the unpredictable nature of wildfires. The technique involves deliberately starting a fire in an area chosen and monitored by firefighters. Once the fire has burnt all the dead trees and fallen plants, the fire will be extinguished. This creates a line of burnt ground that a wildfire can't cross called a “fire break”. Controlled burns have been used for centuries but the recent changes to the environment might mean this old technique needs to change. Especially as some of the biggest wildfires in the US have been caused by controlled burns.



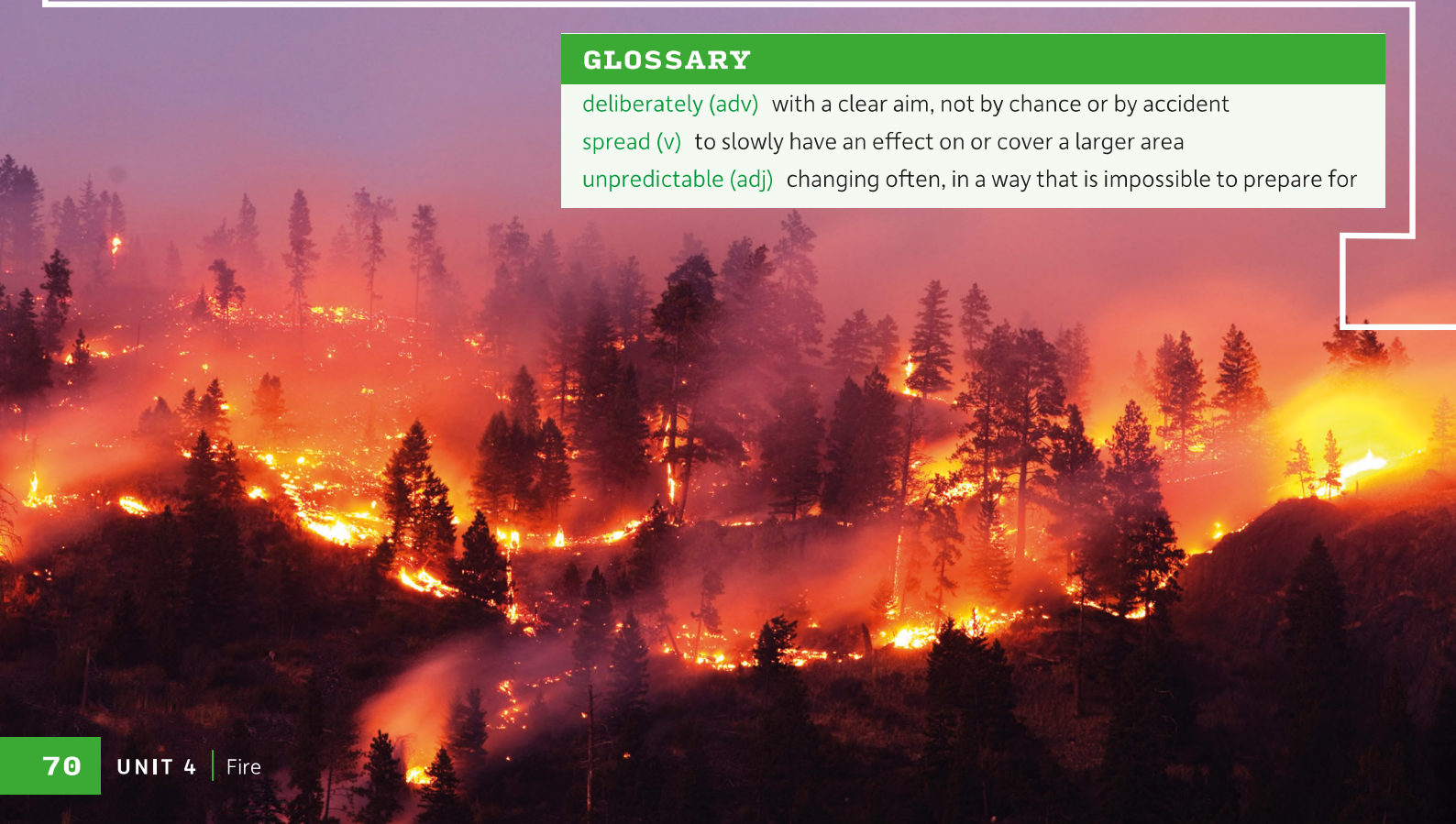
- 5 One such fire was the Calf Canyon and Hermits Peak Fire of 2022 in New Mexico, which burnt an area double the size of New York City, around 350,000 acres. As the name suggests, this wildfire was the combination of two separate fires, both of which were caused by controlled burns by federal authorities. The fire in Calf Canyon was a controlled burn in January of piles of wood that were afterwards covered by snow. Mistakenly, the people in charge believed that the snow would put out the fire. However, the wood stayed hot under the snow and in April, when the snow melted and strong winds blew, the fire started again and quickly spread. The fire in Hermits Peak was a controlled burn in April that was forced beyond the fire breaks by the same strong winds.
- 6 Fortunately, no lives were lost in the 2022 fire but hundreds of buildings were destroyed and thousands of others were threatened. The authorities have acknowledged that mistakes were made and want new regulations for controlled burns. Despite this, many people in New Mexico never want controlled burns to be used again. Understandably, they feel that the cost of the possible errors is too high. So without the use of controlled burns, how else can wildfires be prevented?
- 7 As the wildfires in Siberia demonstrated, one important technique is the sharing of information about wildfires and the use of fire in the local area. By conducting studies of wildfires, rating their danger and possibility, and by analysing wildfire data, authorities can develop their understanding of what causes wildfires. This information also helps authorities to think of how they prevent and respond to fires.
- 8 Other wildfire prevention techniques include cutting down and removing decaying vegetation by machine. Dead plants can also be destroyed using chemicals and chemicals can also be used to prevent plants from growing. Admittedly, these other techniques also have negative side effects. Machines create air and noise pollution. Chemicals pollute the ground and contaminate water supplies. The use of machines and chemicals can also be much more expensive and take a long time to work; nothing is as cheap and fast as a “controlled burn”. Obviously, no matter the technique, the goal is the same — to keep forests healthy and whole, and to protect the surrounding communities.

GLOSSARY

deliberately (adv) with a clear aim, not by chance or by accident

spread (v) to slowly have an effect on or cover a larger area

unpredictable (adj) changing often, in a way that is impossible to prepare for



D CLOSE READING

It's often possible to identify an author's point of view using adverbs in the text:

Fortunately, nobody was killed in the fire. (= the author thinks it's lucky that nobody was killed)

Local residents were **understandably** relieved. (= the author empathizes with the local residents)

Identifying point of view

Read *Is the climate changing our view of fire?* again. Match the points of view to sentences in the text.

- 1 The writer can relate to the residents of New Mexico thinking that controlled burns are too dangerous.
- 2 The writer thinks that it was a bad idea to rely on snow to stop the fires.
- 3 The writer feels it was lucky no one was killed in the 2022 fire.
- 4 The writer accepts that alternative options to controlled burns also have problems.
- 5 The writer thinks it's clear supporters and opponents of controlled burns want the same thing.

E CRITICAL THINKING

Work in a group. Discuss the questions.

- 1 The Calf Canyon and Hermits Peak Fire was set deliberately by trained professionals trying to do something beneficial. Should they have been punished? Why / why not?
- 2 What factors should be taken into account when considering forest management: money, resources, benefits gained, possible risks, other factors?
- 3 Who should be responsible for taking care of large areas of wilderness? Who should be responsible for paying for that care?

VOCABULARY DEVELOPMENT

COLLOCATIONS WITH **PROBLEM**

1 Choose the correct definition for each collocation.

- 1 The root of the **problem**
 - a the problem's fundamental cause
 - b the smallest aspect of a problem
- 2 To cope with a **problem**
 - a to deal with a problem
 - b to give up on dealing with a problem
- 3 To remedy a **problem**
 - a to cause a problem
 - b to solve a problem
- 4 To be faced with **problems**
 - a to encounter problems
 - b to be overcome by problems
- 5 A pressing **problem**
 - a a problem that must be solved soon
 - b a problem that causes great stress
- 6 A minor **problem**
 - a a problem that makes people sad
 - b a problem that is not very serious
- 7 A grave **problem**
 - a a rare or unusual problem
 - b a very serious problem
- 8 A perennial **problem**
 - a a problem that is not so serious
 - b a problem that happens again and again

2 Work in a group. Discuss the questions using information from the texts to help you.

- 1 What are some perennial problems that forests are faced with? Why do you think they are perennial? Which is the gravest?
- 2 Think about the leading causes of fires. Which do you think are the most pressing? How would you remedy those problems?
- 3 What do you think is the root of the problem of controlled burns that get out of control? How do you think the authorities can cope with that problem?

ACADEMIC WORDS AND IDIOMS

1 Match the words in bold with the correct definitions.

- | | |
|---------------------------------|--|
| 1 acknowledge (v) | a a period of ten years |
| 2 capable (adj) | b an official rule that controls how something is done |
| 3 decade (n) | c able to do something |
| 4 error (n) | d to admit or accept that something is true |
| 5 federal (adj) | e a mistake |
| 6 get to grips with (id) | f relating to a national government |
| 7 go without saying (id) | g finding a solution by making mistakes |
| 8 regulation (n) | h to be completely obvious or true |
| 9 trial and error (id) | i to start to deal with a problem |

2 Complete the sentences with words from Exercise 1. Change the form if necessary.

- The National Park Service defines a fuel as any material _____ of burning.
- Local, state, and _____ governments should work together to protect public land.
- An estimated 90% of forest fires are caused by human _____.
- The authorities failed to _____ the problem of wildfires.
- Tighter camping _____ might help reduce numbers of forest fires in the area.
- Through _____, authorities learned the best way to clear forests.
- This land has been privately owned for several _____.
- Many authorities _____ that controlled burns can be risky.
- It _____ that campers need to learn to use fire safely.

3 Work with a partner. Discuss the questions.

- What regulations do you think the government should introduce to reduce the possibility of forest fires caused by human error?
First, the government should ...
- How do you think the government authorities should acknowledge and repair the mistakes they make?
The most important step is for authorities ...

ACADEMIC IDIOMS

TRIAL AND ERROR

Learning by “trial and error” is seen as a positive idea even though it involves making mistakes. The idea is to keep trying different possibilities until a solution is found, e.g. *Through trial and error, the authorities have learned the best ways to control forest fires.*

CRITICAL THINKING

Questioning assumptions

Good arguments should be supported with evidence. However, if it's reasonable to assume that most readers will agree with your position, it may not be necessary to support your argument:

Obviously, controlled burns cannot be left unattended.

As most people would agree that prescribed forest fires should not be left unattended, the writer doesn't need to provide evidence to support this position.

However, sometimes writers make assumptions that not everyone would agree with:

Clearly, global warming has no effect on forest fires.

As many people would disagree with this point of view, the writer needs to provide supporting evidence to strengthen their argument.

Questioning assumptions will help when you are evaluating the strength of a writer's argument.

1 Read the text and underline the assumptions.

We all agree that the problem of forest fires is growing. Obviously, something needs to be done about it. For years, the Forest Service in our state has worked to prevent forest fires from happening or to suppress or control fires that do start. Some people argue for a more aggressive program of controlled burns. But after some recent disasters, surely we can see that none of these methods can work. Rather than try to keep fires away from people's homes, it's clear that what we should do instead is keep homes away from forests. If we passed a law forbidding new home construction within 100 miles of a major forest, we could prevent houses from burning down should a fire occur.

2 Work with a partner. Discuss the questions.

- 1 Which of the assumptions are reasonable? Which are unreasonable? Why?
- 2 What kind of evidence could be used to support the unreasonable assumptions?

3 Work in a group. Discuss the questions.

- 1 Why is it dangerous to assume your readers agree with your position?
- 2 Apart from writers, what other kinds of people make statements they assume you'll agree with?
- 3 Is it ever useful to make assumptions? Why / why not?

WRITING MODEL

You are going to learn about using gerunds as the subject of a sentence, and supporting your arguments. You are then going to use these to write an essay about fire prevention.

A ANALYZE

Read the essay prompt. Brainstorm ideas for the problem and the solution in the two-column chart.

“The number of wildfires is increasing around the world. What are the reasons for this? What solutions can you suggest to cope with this problem?”

Problems	Solutions

B MODEL

Read the student model and answer the questions.

Forest fires around the world are increasing not only in frequency but also in severity. To save our forests and the communities near them, we need to identify the major causes of forest fires and implement some solutions.

The root of the problem is either natural causes, such as lightning strikes, or human causes, such as campfires or fireworks. It goes without saying that preventing lightning is not possible, but we can work harder to prevent human-caused fires, such as by increasing educational programs, making it a crime to engage in dangerous behavior in or near a forest, and hiring more staff at national parks to keep an eye on visitors.

However, I believe what we need most of all is to maintain healthy forests that are less at risk to fires. Using controlled burns is one method, but these burns can be dangerous too. Even if the number of times that authorities lose control of a controlled burn is low, each time it happens, the consequences are severe.

Developing healthier forests is a better remedy. Over the years, forests have become overcrowded. By clearing out old, dead wood and removing some trees, forests can be made less crowded. Another issue is the introduction of plants from other places. Through trial and error, it is now clear which plants threaten native species. If forests were less crowded and non-native species of plants were removed from forests, they would be much healthier. Then, even if a fire started, it would be a minor problem, which firefighters could easily get to grips with.

Even if the solution takes more time and money than controlled burns, the benefits in the long term are worth it.

- 1 What did the writer identify as the problem(s) and solution(s)?
- 2 Why doesn't the writer recommend controlled burns?
- 3 What type of support is not used in the essay?
- 4 What does the conclusion do?

GRAMMAR

Gerunds and reduced clauses

When you see a word ending in *-ing* at the beginning of a sentence, it is usually:

- a gerund, a type of noun
***Setting** fires in windy weather is dangerous.*

or

- part of a reduced clause
***Burning all night**, the fire destroyed 50 acres of land.*

Note that there is no comma after the gerund, whereas there is one after the reduced clause. Use punctuation clues to help you understand the part of speech.

When using a gerund as a subject, remember that it is singular, and therefore takes a singular verb.

1 Check (✓) the sentences that have gerunds as subjects.

- ☐ Supervising children around campfires is very important.
- ☐ Having carefully extinguished the fire, the campers went to bed.
- ☐ Knowing when the conditions are safe for a controlled burn is not easy.
- ☐ Understanding how wildfires are necessary for forest health can be taught in schools.
- ☐ Studying the wind conditions, the authorities concluded that the controlled burn should be delayed.
- ☐ Allowing fires to start naturally is not practical in sectors where a lot of people now live.

2 Rewrite the sentences in your notebook to begin with a gerund. The first one has been done as an example.

- It is important to teach fire safety to everyone.
Teaching fire safety to everyone is important.
- It is necessary to ban smoking in forests.
- It will help people understand fire to read this article.
- It was unfortunate to lose so many acres of land to wildfires.
- It's important to study how erosion happens in the wilderness.
- It will be expensive to train new park service employees.

WRITING SKILL

To convince readers that your arguments are sound, you must support those arguments. Three common ways to do this are with:

- reasons
- examples
- quotes or expert testimony

Write one or two supporting sentences into your outline before you begin your first draft. This will ensure that your arguments are well supported.

Supporting your arguments

1 Read the model essay again. Then answer the questions.

- 1 In paragraph 2, what examples does the writer give of natural causes of fires and of human causes?
- 2 In paragraph 3, how does the writer support the argument against controlled burns?
- 3 In paragraph 4, what types of support are used?

2 Match the arguments (1–4) with the supporting sentences (a–d).

- | | | |
|---|---|-------|
| 1 | Campfires should be prohibited in all forests. | _____ |
| 2 | Climate change is having a direct effect on the number of forest fires in the United States. | _____ |
| 3 | Using controlled burns to remove unwanted plants and trees helps stop fires from spreading. | _____ |
| 4 | Not allowing forest fires to burn out naturally has a negative impact on the ecosystem. | _____ |
| a | A recent study showed a positive correlation between increased global temperatures and instances of forest fire. | |
| b | Many plants have adapted to actually release their seeds when burned. Without forest fires, these plants will simply die out. | |
| c | As many as 90% of wildfires in the United States are caused by human activity, such as not extinguishing campfires properly. | |
| d | Conrad McCarthy of the Mayweather Institute recently stated, “ <i>Clearing vegetation removes a fire’s primary fuel source, and slows its progress.</i> ” | |

3 Work with a partner. Write supporting sentences for the following arguments:

- 1 Current techniques for controlling and extinguishing fires work.
- 2 Forest fires have a positive effect on the environment.
- 3 Campsites should provide better information on the safe use of fire.

WRITING TASK

You are going to write a problem / solution essay in response to the following:
“Preventing campfires from causing wildfires is a major challenge. What are some reasons for this? What can be done to solve this problem?”

Brainstorm

List all the possible problems with campfires and their potential solutions in this two-column chart.

Problems	Solutions

Plan

From your brainstorm, choose your arguments. Write one or two supporting sentences for each one. You can use information from *Reading 1*, *Writing skill*, and your own knowledge.

Write

Use your brainstorm to help you write your essay. Remember to:

- discuss both problems and solutions
- support your argument with reasons, examples or quotes
- use gerunds and reduced clauses where appropriate

Write at least 250 words.

Review

Exchange your essay with a partner. Review the following together:

- Are there enough / too many examples of gerunds and reduced clauses?
- Is the verb after the gerund always singular?
- Is there a comma after the reduced clause?

Rewrite and edit

Consider your partner's comments. Before writing the final draft of your problem / solution essay, check whether your essay:

- addresses the challenge of preventing wildfires
- discusses both problems and solutions
- supports your arguments appropriately

WORDLIST

 macmillan dictionary

Vocabulary preview

beneficial (adj) **	historically (adv) *	supervise (v) **
conduct (v) ***	latter (adj) ***	threaten (v) ***
costly (adj) *	maintenance (n) **	vegetation (n)
employ (v) ***	melt (v) **	wilderness (n)
enforce (v) **	renew (v) **	
extinguish (v)	rural (adj) ***	

Vocabulary development

cope (v) ***	minor (adj) *	problem (n) ***
face (v) ***	perennial (adj)	remedy (v) *
grave (adj) *	pressing (adj)	root (n) ***

Academic words and idioms

acknowledge (v) **	error (n) ***	goes without saying (id)
capable (adj) ***	federal (adj) **	regulation (n) ***
decade (n) ***	get to grips with (id)	trial and error (id)

ACADEMIC WORDS AND IDIOMS REVIEW

Complete the sentences with the words and phrases in the box.

capable depressed error federal solely trial and error

- 1 Authorities shouldn't rely _____ on the controlled burn technique.
- 2 It's hard not to feel _____ about the effects of global warming.
- 3 Through _____, governments found ways to prevent wildfires.
- 4 Many things are _____ of starting a wildfire other than lightning.
- 5 When it comes to fire prevention, even the smallest _____ can have grave consequences.
- 6 The _____ government is responsible for all the forests in this area.

UNIT REVIEW

Reading 1	<input type="checkbox"/>	I can use word parts to understand meaning.
Reading 2	<input type="checkbox"/>	I can recognize adverbs to identify point of view.
Academic skill	<input type="checkbox"/>	I can use the SQ3R technique.
Vocabulary	<input type="checkbox"/>	I can use vocabulary for talking about wildfires.
Writing	<input type="checkbox"/>	I can support my arguments.
Grammar	<input type="checkbox"/>	I can use gerunds as subjects.

ATMOSPHERIC

I was eating breakfast casually watching the local five-day weather forecast on a television screen behind the counter. Wednesday had a friendly-looking cloud and a few raindrops, and Thursday had a dark, threatening cloud with heavier drops. I knew Thursday's conditions would be much rougher than the symbol conveyed. I had been studying detailed satellite data and weather models, and they indicated that a major atmospheric river (AR) was likely to hit the city.

Struck by the inadequacy of the TV weather icons, I pledged to finish an intensity scale for ARs. I envisioned a square, yellow box on the screen for Thursday with a storm system's ranking in bold, black characters, similar to how hurricanes are characterized as categories 1 to 5. This ranking would allow weather forecasters, emergency planners, safety personnel and reservoir managers—as well as the public—to better prepare for potential flooding, transportation disruptions, downed power lines, debris flows or evacuations.

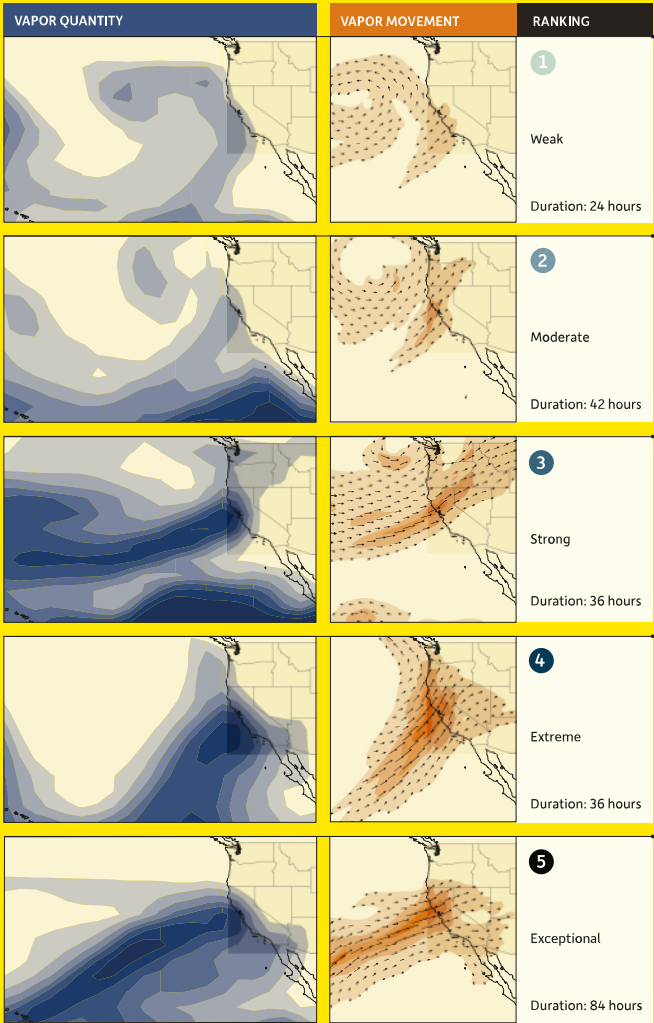
ARs are essentially rivers of water vapor in the sky that are pushed along by strong, low-altitude winds, sometimes at hurricane speeds. An average AR brings far greater rainfall than a typical rain or thunderstorm in those parts of the world, transporting enough vapor to equal 25 times the flow rate of the Mississippi River where it pours into the Gulf of Mexico.

These storms can produce disastrous flooding, including the biggest floods that some areas may see in a century. They can occur in families—a series of storms, as if rolling in on a treadmill. Several times a year they pummel the western coasts of the U.S., Canada, Europe, Africa, South America and New Zealand.

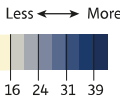
ARs are not always destructive; sometimes they bring welcome rain to parched regions. They can beneficially boost snowpack and help fill natural and human-made water reservoirs. It's hard to know more than a few days ahead where exactly a storm will make landfall, however. As big as they are, they can be fickle because numerous forces can affect their progression, from ocean-surface temperatures to pockets of cold air aloft.

Researchers and weather forecasters have gotten better at informing emergency planners and water managers on whether a storm will bring rain that is good for replenishing water supplies or crosses a threshold into floods and landslides. With greater preparedness, officials can lessen risk to property and lives and know how to maximize water storage.

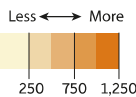
by E. Martin Ralph



Color indicates kilograms of vapor in a vertical column of atmosphere above a square meter of Earth's surface.



Color represents kilograms of vapor transported per meter per second.



RIVERS

GLOSSARY

- vapor (n)** very small drops of water in the air that make the air feel wet
threat (n) a situation or an activity that could cause harm or danger
aloft (adj) high up in the air
replenish (v) to make something full again



INTEGRATED SKILLS

You will read a passage about atmospheric rivers and analyze a diagram. You will then hear a short podcast related to the topic. There are some questions to help you with language and the main ideas. Finally, you will summarize the points in both texts.

CLOSE READING

Read the Scientific American text about atmospheric rivers and analyze the diagram. Answer the questions.


- 1 An atmospheric river (AR) is a **thunderstorm** / **vapor storm** / **hurricane**.
- 2 ARs are damaging because they arrive **in groups** / **on treadmills** / **every century**.
- 3 **Changing air temperatures** / **falling land** / **big storms** affect how ARs move.
- 4 The **quantity** / **movement** / **weight** of vapor is measured in kilograms per meter per second.
- 5 A typical beneficial AR lasts **24** / **36** / **84** hours.

READING ANALYSIS

Work with a partner. Discuss the questions about the passage and the diagram.

- 1 What problems could be prevented by using a ranking system for ARs?
- 2 How could a ranking system for ARs be used to benefit water managers?

CLOSE LISTENING

 Listen to the podcast. Complete each sentence with one or two words.

- 1 Atmospheric rivers deliver water vapor and strong _____.
- 2 An AR can carry similar amounts of _____ as 15 to 20 Mississippi rivers.
- 3 Almost 50% of the most extreme storms in the world's _____ are due to ARs.
- 4 ARs are the most common type of storm that result in huge costs to _____.
- 5 Future climate change might cause more _____ atmospheric rivers.

LISTENING ANALYSIS

Work with a partner. Discuss the questions about the podcast.

- 1 Why did the scientists decide to study the historical data of atmospheric rivers?
- 2 What kind of problems did the data show were caused by atmospheric rivers?

INTEGRATED WRITING

Summarize the points made in the podcast and explain the benefits of using historical data and a ranking system for ARs. Write between 150 and 225 words for your answer.