COPING WITH CLIMATE

Animal migration

Animals are very good at **adapting** to changes in weather and climate. Many animals move from place to place to escape extreme cold or heat, or to find more **plentiful** food supplies. Many species also **migrate** to breed. They move **temporarily** to warmer places to mate, give birth or lay eggs and sometimes to raise their young. Migration is particularly common among birds and sea animals, but many land-based animals migrate too.

▼ Humpback whales migrate north to escape the Antarctic winter so they can breed.

Longest migration

The most impressive migrations are performed by whales. The humpback whale has been known to travel more than 5000 kilometres in a year. It feeds in cool areas and then travels to warmer waters to breed. Humpback whales travel north from Antarctica to breed between June and November, when they are often seen along the coast of Australia.

FACT!

The caribou (reindeer) lives in the northern hemisphere. It migrates north during summer to feed in warmer areas. It can travel around 2500 kilometres each year – further than any other land animal.

Hibernation

Animals whose food supplies run low in the winter often hibernate. This means going into a very deep sleep. During hibernation, the animal's body temperature drops and its heart rate slows down to save energy. Because the animal's body uses less energy, it doesn't need as much food.

Australian animals in hibernation

Very few Australian animals hibernate, due to Australia's warm climate. The best-known hibernating Australian animal is the short-beaked echidna, which hibernates during the winter. It sometimes wakes and moves around during this period, probably to adjust its body temperature.

The mountain pygmy-possum is the only Australian **mammal** that hibernates. It is found in **alpine** areas of Victoria and New South Wales. It hibernates in its nest under the snow for up to seven months each year.

▲ Short-beaked echidna

▼ Mountain pygmy-possum

QUESTIONS

1. Why do you think it is particularly common for birds and sea animals to migrate?
2. Imagine you were an animal that hibernated. How do you think you would find the experience of sleeping and not eating for several months?
3. What is the antonym for the word 'temporarily'? Show your understanding of the term by using it in a sentence.
4. Use the QR code to watch the video on the mountain pygmy-possum. List three reasons why you think this animal is Australia's only hibernating marsupial.
5. Formulate five questions that you could ask to research another hibernating animal. Once you have formulated your questions, conduct the research.
6. Using the information gathered in the previous activity, create a short video or write an explanation similar to the mountain pygmy-possum video, explaining how your chosen animal hibernates.

Scan the code to link to a video about work being done to protect the endangered mountain pygmy-possum.

VOLCANOES

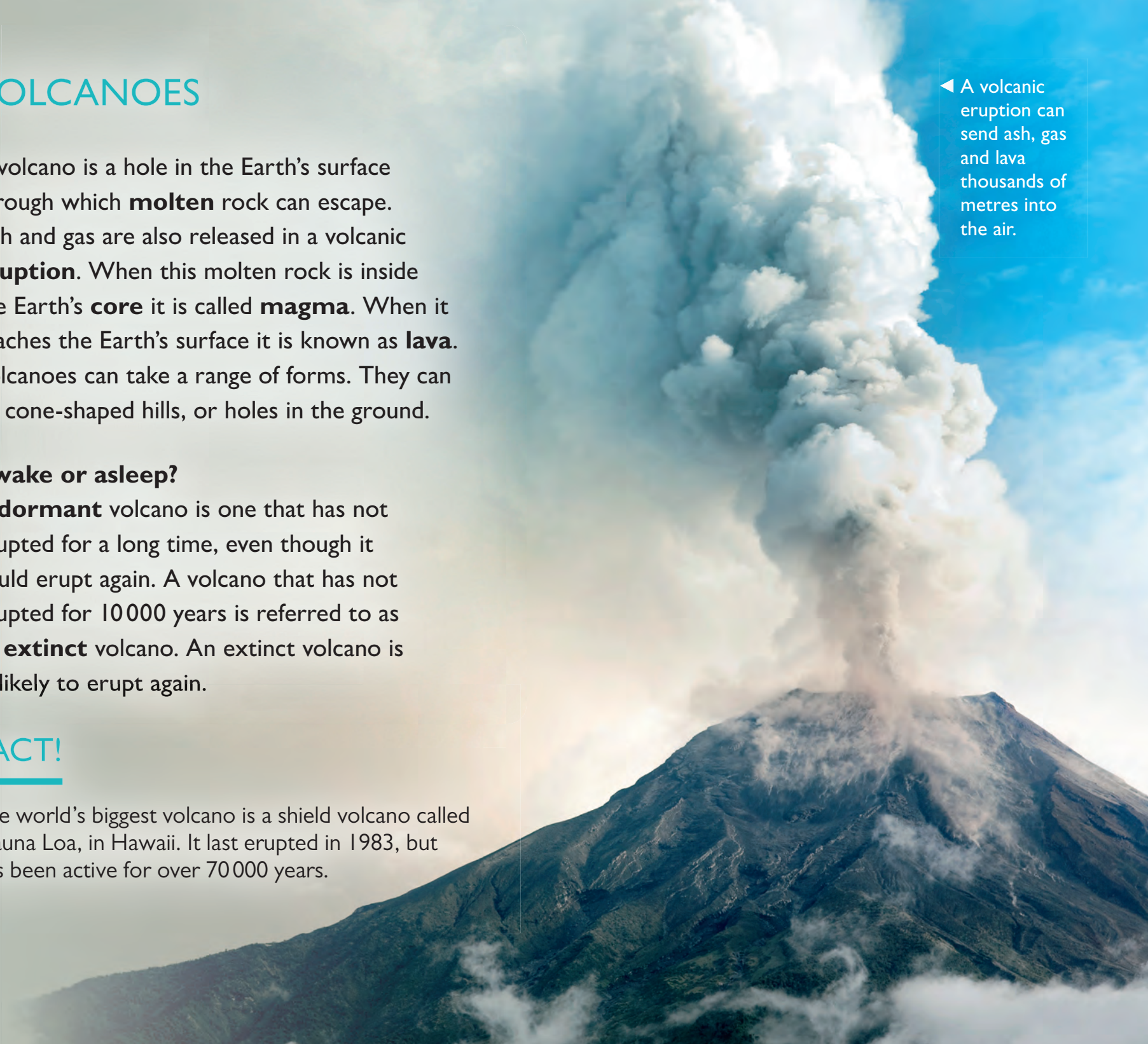
A volcano is a hole in the Earth's surface through which **molten** rock can escape. Ash and gas are also released in a volcanic **eruption**. When this molten rock is inside the Earth's **core** it is called **magma**. When it reaches the Earth's surface it is known as **lava**. Volcanoes can take a range of forms. They can be cone-shaped hills, or holes in the ground.

Awake or asleep?

A **dormant** volcano is one that has not erupted for a long time, even though it could erupt again. A volcano that has not erupted for 10 000 years is referred to as an **extinct** volcano. An extinct volcano is unlikely to erupt again.

FACT!

The world's biggest volcano is a shield volcano called Mauna Loa, in Hawaii. It last erupted in 1983, but has been active for over 70 000 years.



◀ A volcanic eruption can send ash, gas and lava thousands of metres into the air.

▲ When a volcano erupts, lava flows out of the volcano and across the surface of the Earth.

Scan the code to link to a video about the dangers faced by volcanologists – people who study volcanoes.

Shield volcano

Shield volcanoes are wide volcanoes with gently sloping sides. They are usually formed by slow-flowing lava rather than by big spurts. Their name comes from their distinctive shape – they look like shields on the ground.

Composite volcano

Composite volcanoes are usually the result of **explosive** eruptions. When they erupt, the magma spurts out and often forms volcanic ash – tiny pieces of lava floating in the air. Composite volcanoes are usually steep and cone-shaped.

Caldera volcano

Caldera volcanoes form from extremely violent eruptions. The explosion leaves a large hole in the ground, which can often be several kilometres wide. Caldera volcanoes are the least common type of volcano.

QUESTIONS

1. Explain the difference between a dormant and an extinct volcano.
2. Read the descriptions of the three different types of volcanoes. Which are you most familiar with? Explain why you think this is.
3. The plural form of volcano requires you to add an -es. Provide three other words where an -es is added to form the plural.
4. Use the QR code to watch the video on the life of a volcanologist. As you watch the video, list all the words that come into your mind. For example, these words may be facts, volcano terminology or adjectives describing a volcano.
5. Type your words into a word cloud website such as Wordle or Tagxedo. Create the word cloud and save a copy.
6. Paste your word cloud into an app or a software program. Write five sentences using as many words as you can from the word cloud to describe and explain a volcano.

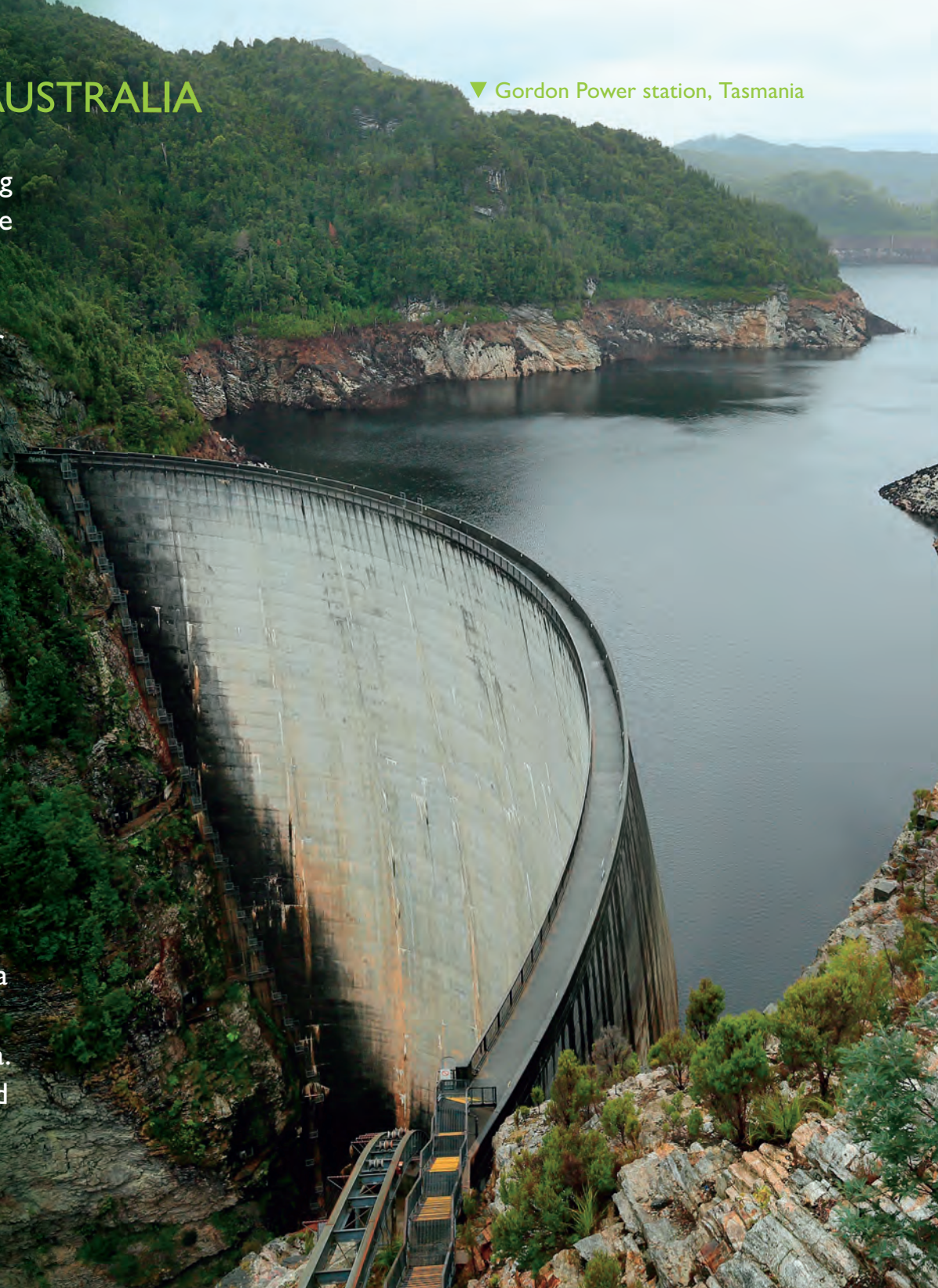
HYDRO-ELECTRICITY IN AUSTRALIA

Hydro-electricity is produced when flowing water is used to turn **turbines**, which use motion to produce electricity. The turning turbine blades drive electrical generators. These convert the movement of the water into electrical energy. Most hydro-electric power plants are built beside dams. The flow of water from the dams is controlled so that it turns the turbines at the ideal rate to produce electricity.

Hydro-electricity provides about 8 per cent of the electricity generated in Australia.

Tasmania leads the way

Hydro-electricity has been an important source of power in Australia since 1895, when the first hydro-electric power plant was opened in Tasmania. There are now 29 hydro-electric power plants in Tasmania alone. Hydro-electricity provides around 90 per cent of the power used in Tasmania. Hydro-electric power plants are also found in all other states of Australia.



▼ Gordon Power station, Tasmania

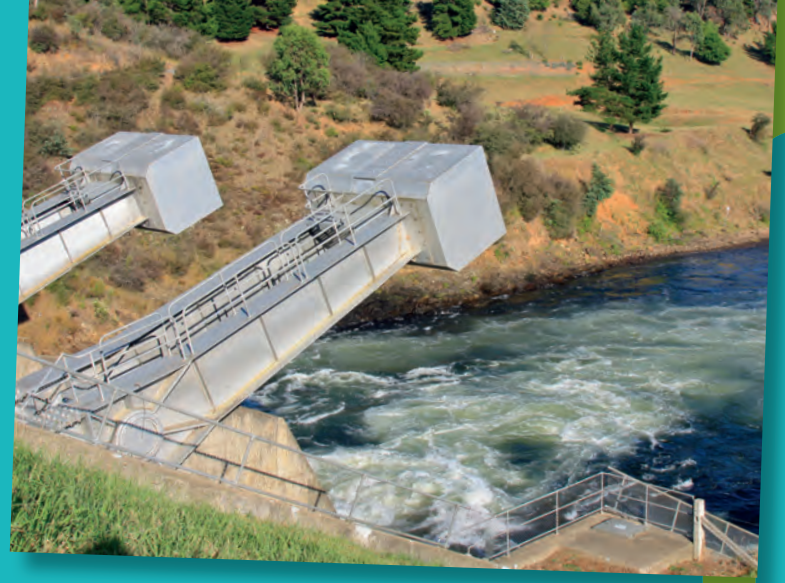
The Snowy Mountains Scheme

Australia's largest and most famous hydro-electric power plant is the Snowy Mountains Scheme in New South Wales. The scheme uses water from melted snow, which is channelled into dams. The dams release the water to turn the plant's turbines.

The Snowy Mountains Scheme takes up an area of more than 5000 square kilometres, including 225 kilometres of pipeline and tunnels. Most of it is underground and out of sight.

Building the Scheme

The Snowy Mountains Scheme took 25 years to build. Construction began in 1949 and was not completed until 1974. Building the scheme required great feats of engineering. Tunnels were drilled through the mountains, and huge concrete dams had to be constructed. More than 100 000 people were involved in the construction of the scheme.



▲ The Snowy Mountains Scheme is an enormous hydro-electric power plant spanning several thousand square kilometres.

FACT!

By 2011, hydro-electric power was producing 67 per cent of Australia's **clean energy** power.

Today, the scheme is made up of 16 large dams and 7 power stations. After the water from the dam has been used to turn the turbines, it is released into the Murrumbidgee and Murray Rivers and is then used to **irrigate** farmland.

QUESTIONS

1. What sort of environment and climate is needed for a hydro-electric plant?
2. Do you think hydro-electricity should provide more than 8 per cent of Australia's electricity? Why or why not?
3. Define the word 'turbine'.
4. Use the QR code to watch the video on the creation of the Snowy Mountains Scheme. As you are watching, make a list of the different jobs and roles played by workers.
5. As well as the energy it produces, there are other positives of the Snowy Mountains Scheme. List some of these positives.
6. Imagine you are one of the workers on the Snowy Mountains Scheme. Write a diary entry describing your experiences and thoughts on building the scheme.

Scan the code to link to a video about the work done to create the Snowy Mountains Scheme.