

# Mathematics Level 7

## Chapter 2 — The world stage: continents, climates, vegetation and sustainability

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## Dividing up the world: lines, continents, oceans and maps

### Geography 4 · Chapter 2 · 2A

**Owens:** VC2HG4K05 (Geographical Knowledge and Understanding — Diversity of places and environments) **Draws on:** VC2HG4K05.E01 · VC2HG4K05.E02 · VC2HG4K05.E03 · VC2HG4K05.E04 · VC2HG4K05.E05

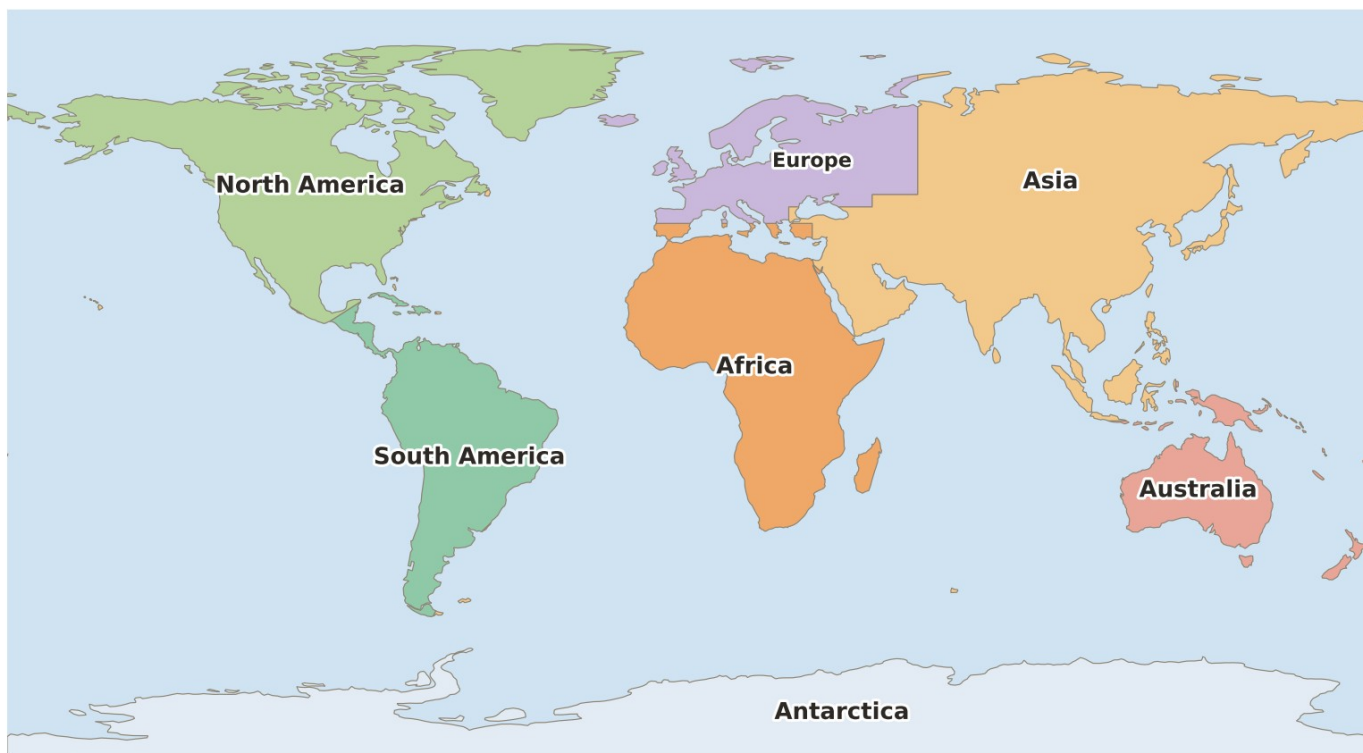
This section builds the map of the world you carry in your head: the continents and oceans, the great lines people drew around the Earth, the halves and zones those lines make, the four direction words, and one big idea — every flat map of the world changes something. The zones come back in 2B; the maps, lines and direction words come back in 3C and 4C; and 4C makes a projections table like the one in this section.

**Teacher note.** Read the pages together first; every new word is explained the first time it appears. The “how many continents?” box is a discussion, not a fact to learn by heart — the point is that the count is a choice people make, and our book uses seven. Q9 works best outside, or at a window, with the real schoolyard in view. The possible answers at the end show the shape of a good response, not the only one.

### What we are learning

**The land parts and the water parts.** The land on our planet sits in a few very big pieces. A **continent** is one of the world’s very big areas of land — big enough to be a part of the world all on its own. Australia is one. The water sits in even bigger pieces. An **ocean** is a very big area of salt water. Here are the seven continents, each in its own colour.

### The seven continents



A continent is one of the world's very big areas of land. There are seven of them. The blue is ocean water.

*A world map with the seven continents in seven colours and labelled: Asia, Africa, North America, South America, Antarctica, Europe and Australia, on blue ocean water*

And here are the five oceans. Notice where Australia sits.

## The five oceans

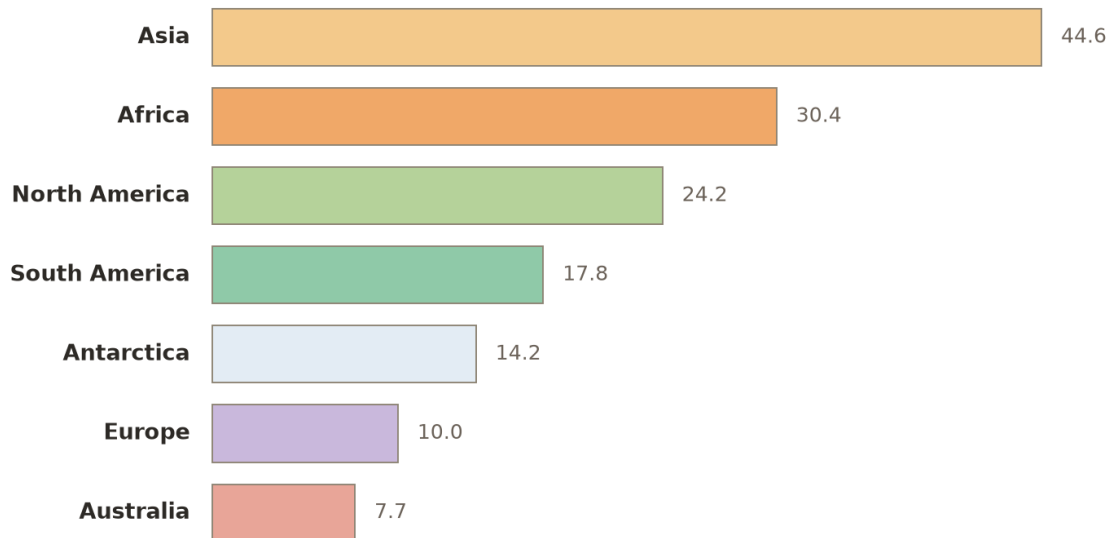


An ocean is a very big area of salt water. There are five of them. Australia sits between the Indian and Pacific oceans.

*A world map with sand-coloured land and the five oceans labelled in blue: Pacific Ocean on both sides, Atlantic Ocean, Indian Ocean, Southern Ocean and Arctic Ocean; Australia sits between the Indian and Pacific oceans*

Not all continents are the same size, and not all oceans are the same size. The bars below show each one's area in million square kilometres (1 million = 1,000,000). Areas are rounded from Wikipedia's "Continent" and "Australia" pages, looked up 25 August 2026.

## How big is each continent?

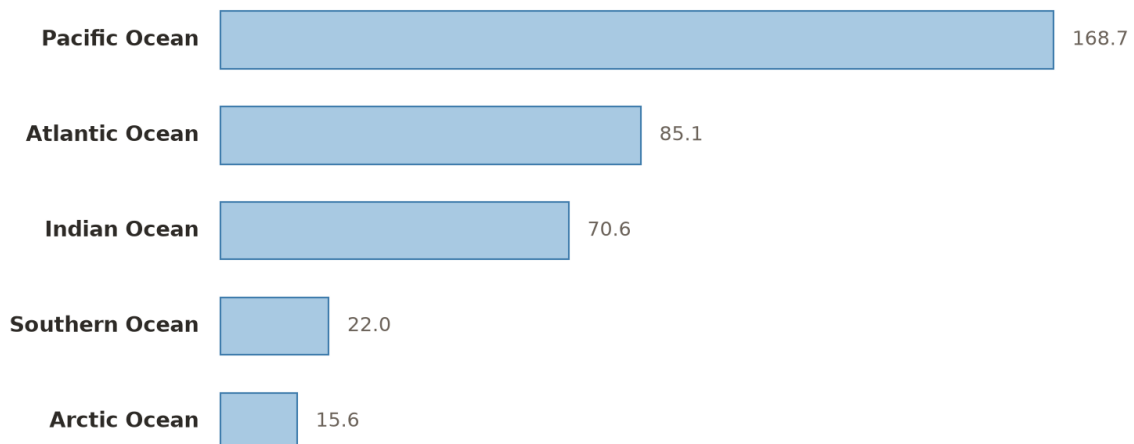


Each bar shows the continent's area in million square kilometres (1 million = 1,000,000).

Australia is the smallest continent. Asia is the biggest. Areas rounded from Wikipedia, "Continent" and "Australia", looked up 25 August 2026.

*A bar chart of the seven continents from biggest to smallest: Asia 44.6, Africa 30.4, North America 24.2, South America 17.8, Antarctica 14.2, Europe 10.0, Australia 7.7 million square kilometres; Australia is the smallest continent and Asia is the biggest*

## How big is each ocean?



Each bar shows the ocean's area in million square kilometres (1 million = 1,000,000).

The Pacific Ocean is by far the biggest — about 11 times the size of the Arctic Ocean. Areas rounded from Wikipedia, "Ocean", looked up 25 August 2026.

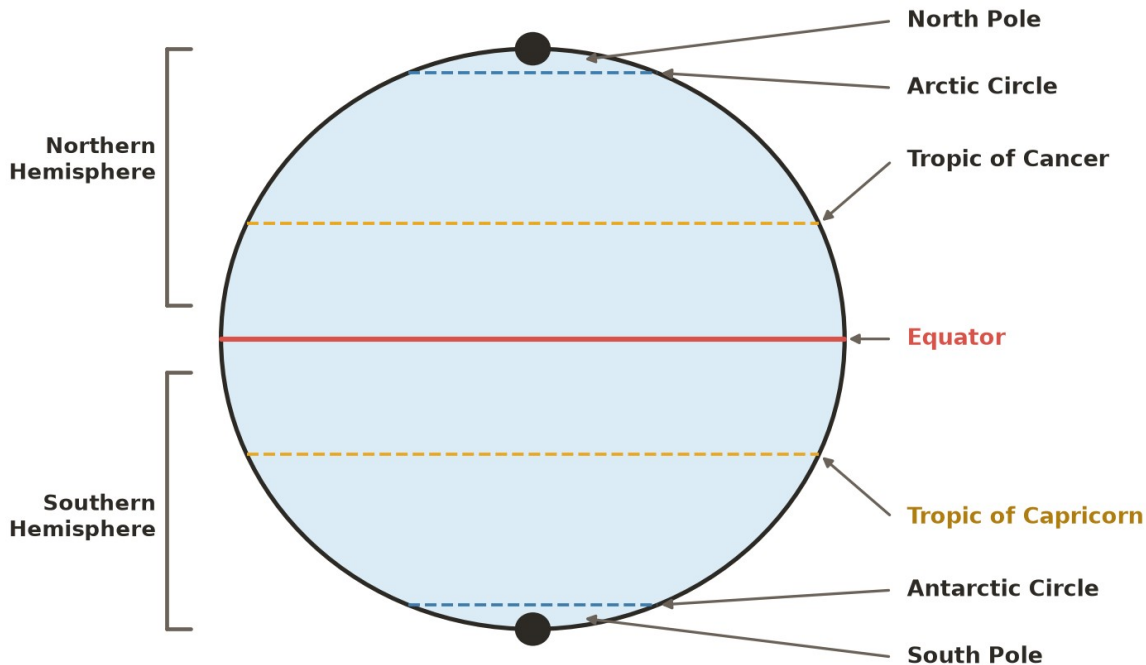
*A bar chart of the five oceans from biggest to smallest: Pacific Ocean 168.7, Atlantic Ocean 85.1, Indian Ocean 70.6, Southern Ocean 22.0, Arctic Ocean 15.6 million square kilometres; the Pacific is about 11 times the size of the Arctic*

**How many continents are there?** Our book says seven — but you may meet people who say six, or five, and they are not being silly. The land of Europe and Asia joins up into one long piece, so some countries teach them as one continent, called **Eurasia**; that count gives six. Some people also join North and South America into one “America”, which can bring the count down to five. Every count is a choice about where one big area of land stops and the next one starts. Wikipedia’s “Continent” page (looked up 25 August 2026) lists the seven we use and names the other counts too. Australian school maps most often show seven, so seven is the count this book uses. (VC2HG4K05 . E01)

**The lines people drew.** The Earth does not really have lines on it. People drew them on maps and globes so that everyone can talk about the same places. The **equator** is the line around the middle of the Earth. It splits the world

into two halves called **hemispheres**: the Northern Hemisphere and the Southern Hemisphere. The **tropics** are two more lines: the Tropic of Cancer at 23.4° north and the Tropic of Capricorn at 23.4° south. Near the ends of the Earth are the **North Pole** and the **South Pole**, and two lines near them, the Arctic Circle and the Antarctic Circle (66.5°).

### The world's main imaginary lines

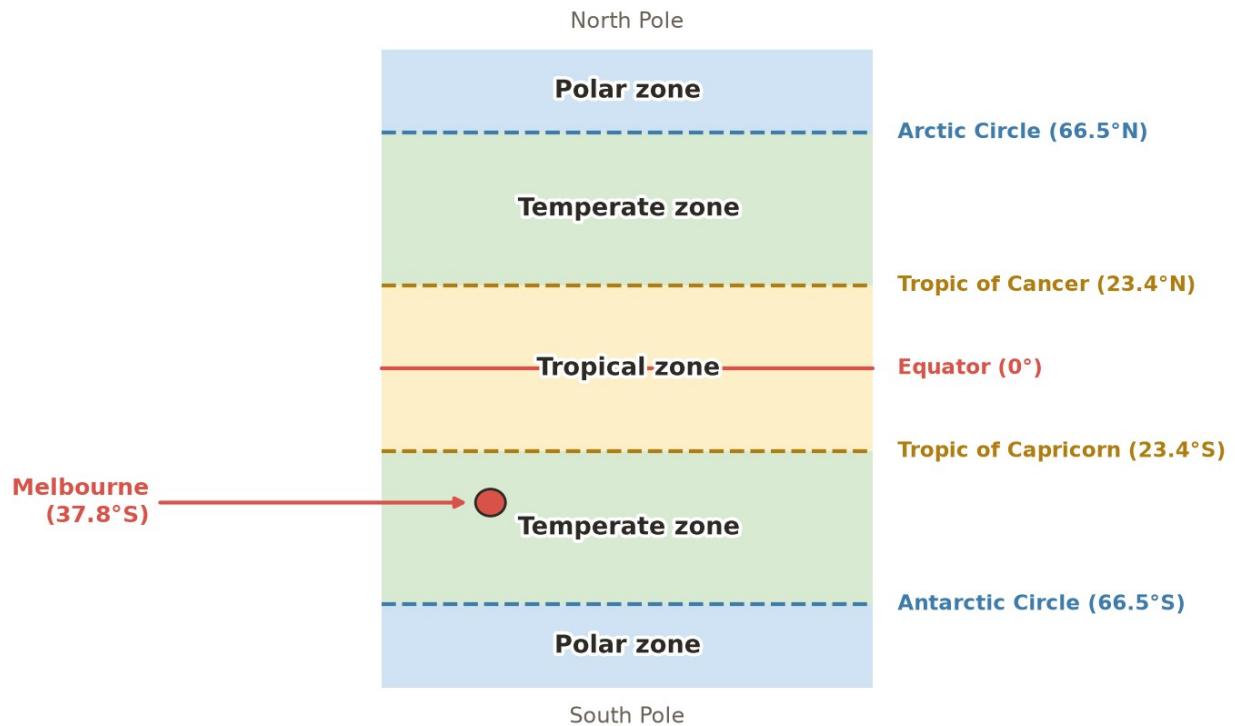


These lines are not really on the Earth. People drew them to help find places. The equator splits the world into the two hemispheres.

*A globe drawn as a circle with the equator as a solid red line around the middle, the Tropic of Cancer and Tropic of Capricorn as dashed yellow lines, the Arctic and Antarctic circles as dashed blue lines, dots at the North Pole and South Pole, and labels on the left for the Northern Hemisphere and Southern Hemisphere*

**Zones.** Those lines make bands around the world called **zones**. The band between the two tropics is the **tropical zone** — the hottest band. The bands between a tropic and a polar circle are the **temperate zones** — not too hot, not too cold. The caps beyond the circles are the **polar zones** — the coldest parts of the world.

# The world's tropical, temperate and polar zones



The zones run in bands around the world. Melbourne, and all of Victoria, sit in the temperate zone.

*A band diagram from the North Pole to the South Pole: polar zone, Arctic Circle 66.5° north, temperate zone, Tropic of Cancer 23.4° north, tropical zone with the equator at 0°, Tropic of Capricorn 23.4° south, temperate zone, Antarctic Circle 66.5° south, polar zone; a dot shows Melbourne at 37.8° south in the temperate zone*

The Tropic of Capricorn crosses Australia itself — through Western Australia, the Northern Territory and Queensland (Wikipedia, “Tropic of Capricorn”, looked up 25 August 2026). Victoria sits well south of the line.

## The Tropic of Capricorn crosses Australia

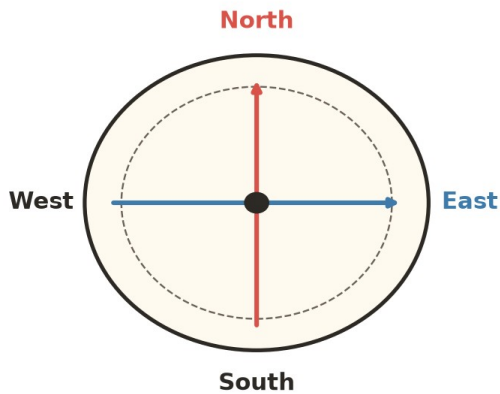


It crosses Western Australia, the Northern Territory and Queensland. Victoria sits well south of it, in the temperate zone.

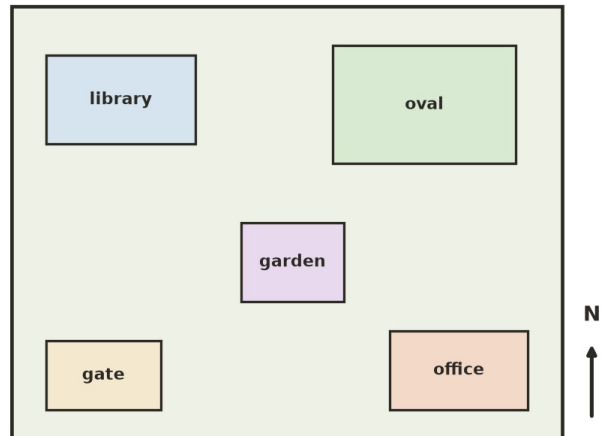
*A map of Australia with the Tropic of Capricorn drawn as a dashed red line at 23.4° south crossing Western Australia, the Northern Territory and Queensland; a dot marks Melbourne at 37.8° south and an arrow points to Victoria, all of it south of the line*

**Four direction words.** People who study places describe where things are with **compass directions: north, south, east and west.** On most maps, north is at the top. The picture below shows the four words and a model school yard to read them on. (VC2HG4K05 . E05)

## North, south, east and west



The four compass directions



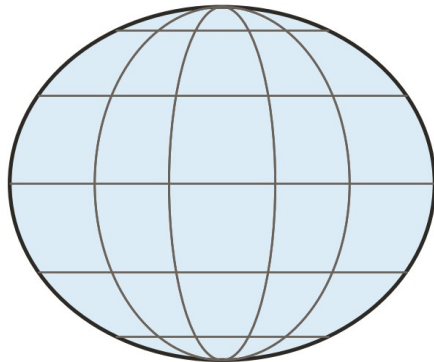
A model school yard. On most maps, north is at the top.

Read the yard map: the library is north of the garden. The oval is east of the library. The gate is south of the garden. The office is east of the gate.

*On the left, a compass rose with the four compass directions labelled: North at the top, South at the bottom, East to the right, West to the left. On the right, a model school yard map with a library at the top left, an oval at the top right, a garden in the middle, a gate at the bottom left, an office at the bottom right and a north arrow*

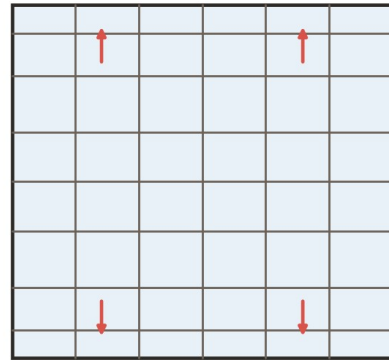
**Round world, flat paper.** A globe is the truest picture of the world, because the world is round. But a globe is hard to carry and hard to print. So map-makers show the round Earth on flat paper. A **map projection** is a way of doing that. Here is the problem: you cannot flatten a round shape without stretching or squashing it somewhere. Map-makers have a name for that changing: **distortion**.

## From round to flat



**The world is round.**

draw it  
flat  
→



**A flat map has to stretch somewhere.**

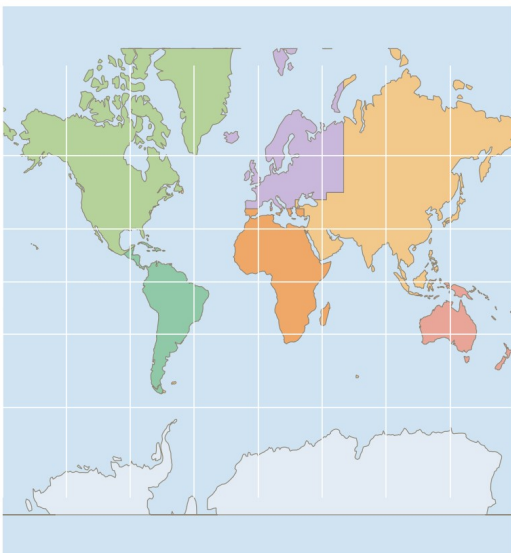
You can't flatten a round shape without stretching or squashing it — try it with the peel of an orange. Every flat map of the world changes something.

*On the left a round globe with a grid of lines; an arrow labelled “draw it flat” points to a flat square map on the right whose grid is stretched near the top and bottom edges*

Different projections stretch different things. These two pictures show the very same world drawn two different ways.

### The same world, drawn two different ways

**Mercator**



**Robinson**



Straight edges. Good for direction. Lands far from the equator look much too big.

Curved edges. Sizes are closer to the truth. Shapes bend a little at the edges.

*Two world maps side by side: the Mercator projection with straight edges where lands far from the equator look much too big, and the Robinson projection with curved edges where sizes are closer to the truth and shapes bend a little at the edges*

How much too big? Look at Greenland and Africa drawn at the same scale, with sizes true. Africa is about 14 times as big as Greenland (areas from Wikipedia’s “Continent” and “Greenland” pages, looked up 25 August 2026). On a Mercator map the two look almost the same size. That is the distortion talking, not the world.

## The true sizes, drawn at the same scale

**Africa is about 14 times as big as Greenland.**

On a Mercator map, Greenland looks almost the same size as Africa.



**Africa**

about 30.4 million square kilometres



**Greenland**

about 2.2 million square kilometres

Areas: Wikipedia, "Continent" and "Greenland", looked up 25 August 2026.

*Africa and Greenland drawn side by side at the same scale so their true sizes compare: Africa with Madagascar, much bigger, and a small Greenland; the caption says Africa is about 14 times as big as Greenland*

No flat map keeps everything true. Map-makers pick the projection that fits the job. Here are four famous ones — the same four you will meet again in 4C, where you will build a table like this one yourself. Compare them; you do not need to master them yet.

Four map projections — each keeps something true and changes something else

A map projection is a way of showing the round Earth on flat paper.

| Projection    | What it keeps close to true                  | What it changes most                                 | Often used for            |
|---------------|----------------------------------------------|------------------------------------------------------|---------------------------|
| Mercator      | shapes and directions                        | sizes — lands far from the equator look much too big | maps for ships; web maps  |
| Robinson      | a fair all-round look of the whole world     | the edges curve, so some shapes bend a little        | world maps in class       |
| Stereographic | shapes near the middle, at one pole          | lands near the edge stretch a lot                    | maps of the polar regions |
| Conic         | shapes and sizes in a band across the middle | lands outside the band bend                          | maps of one country       |

No flat map can keep everything true. Map-makers pick the projection that fits the job.

A comparison table of four map projections. Mercator keeps shapes and directions close to true but makes lands far from the equator look much too big, and is used for maps for ships and web maps. Robinson keeps a fair all-round look of the whole world but the edges curve, and is used for world maps in class. Stereographic keeps shapes near the middle at one pole but lands near the edge stretch a lot, and is used for maps of the polar regions. Conic keeps shapes and sizes in a band across the middle but lands outside the band bend, and is used for maps of one country

Worked examples

Example 1 — step by step: about how many Australias fit inside Asia?

(VC2HG4K05.E01)

A continent is one of the world’s very big areas of land. But how different are the sizes? The class used the bar chart of continent sizes.

| What we do                                                                                                                                                                              | Why it works                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| We read Asia’s bar: 44.6 million square kilometres. We read Australia’s bar: 7.7 million square kilometres.                                                                             | A bar chart turns sizes into numbers we can work with.                                 |
| We ask: 7.7 plus 7.7 is 15.4; two Australias are not even half of Asia. We keep adding: $3 \times 7.7 = 23.1$ ; $4 \times 7.7 = 30.8$ ; $5 \times 7.7 = 38.5$ ; $6 \times 7.7 = 46.2$ . | Adding the same number again and again is a quick way to divide without long division. |
| We stop at six: 46.2 is just past 44.6, so about six Australias fit into Asia (a little less than six, really — about 5.8).                                                             | “About” is honest. The bars are rounded, so the answer is rounded too.                 |
| We say what it means: Asia is the biggest continent and Australia is the smallest, and the gap is huge — nearly six of us fit in one of them.                                           | A number only matters once we say what it tells us about the world.                    |

Example 2 — step by step: which zone is Melbourne in — and which

hemisphere? (VC2HG4K05.E04 · VC2HG4K05.E02)

The class wanted to place Melbourne on the zone diagram. Melbourne sits at 37.8° south of the equator (Wikipedia, “Melbourne”, looked up 25 August 2026).

| What we do                                                                                                                                                                   | Why it works                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| We find 37.8°S on the diagram: it is south of the equator (0°), south of the Tropic of Capricorn (23.4°S), but north of the Antarctic Circle (66.5°S).                       | The lines are the fences between zones. How far south a place is tells us which part it sits in. |
| We name the zone: between the Tropic of Capricorn and the Antarctic Circle is the <b>temperate zone</b> . So Melbourne is in the temperate zone — and so is all of Victoria. | Naming the zone is the whole task (VC2HG4K05.E04).                                               |
| We name the half: Melbourne is south of the equator, so it is in the <b>Southern Hemisphere</b> .                                                                            | The equator is the fence between the two hemispheres.                                            |
| We check against the map: on the Australia map, Melbourne's dot sits well below the dashed tropic line. Yes — temperate, and south.                                          | A second picture is a free check. Two maps agreeing is good geography.                           |

## Practice tasks

### With help

**Q1.** Continents by size (VC2HG4K05.E01 · VC2HG4K05.E02). Look at the seven-colour world map and the continent bar chart.

1. Write the seven continents in size order, biggest first.
2. Which continents are bigger than Australia? Count them.
3. Which is the smallest continent? Which is the biggest?

**Q2.** Oceans around Australia (VC2HG4K05.E02). Look at the five-oceans map.

1. Which ocean is west of Australia?
2. Which ocean is east of Australia?
3. Which ocean would you cross to sail from Australia to the South Pole?

**Q3.** Match the line to its story (VC2HG4K05.E02). Draw a line from each name to the right story. Use the globe picture to help.

| Name                   | Story                                            |
|------------------------|--------------------------------------------------|
| a. equator             | 1. the point at the very top of the world        |
| b. Tropic of Capricorn | 2. the line around the middle, at 0°             |
| c. North Pole          | 3. the line at 23.4° south; it crosses Australia |
| d. Antarctic Circle    | 4. the line at 66.5° south, near the South Pole  |

**Q4.** Which zone? (VC2HG4K05.E04) Look at the zone diagram.

1. Which zone does the equator run through?
2. Which zone is Melbourne in?
3. Which zone is the South Pole in?
4. The tropical zone sits between which two lines?

**Q5.** Read the yard (VC2HG4K05.E05). Finish each sentence about the model school yard with *north*, *south*, *east* or *west*.

1. The oval is \_\_\_\_\_ of the library.
2. The gate is \_\_\_\_\_ of the garden.
3. The library is \_\_\_\_\_ of the gate.
4. The office is \_\_\_\_\_ of the oval.

**Q6.** Read a source, then question it. Here is a short source, written from Wikipedia’s “Australia” page (looked up 25 August 2026).

Australia is the smallest of the seven continents, about 7.7 million square kilometres in size. It sits in the Southern Hemisphere, with the Indian Ocean on its west side and the Pacific Ocean on its east side.

1. Which hemisphere is Australia in?
2. Name the two oceans either side of it.
3. One sentence of this source is a size, one is a half, two are directions. Write which is which.

### **On your own**

**Q7.** Your own outline map (VC2HG4K05 .E02). On a blank page, draw a simple outline map of the world — the shapes can be rough. Label: the seven continents, the five oceans, the equator, the Tropic of Capricorn, the North Pole and the South Pole. Then draw a small star where Australia is.

**Q8.** How many continents — your say (VC2HG4K05 .E01). Some people count six continents, joining Europe and Asia into one, Eurasia. In two or three sentences: explain why that is a fair choice, then explain why our book uses seven.

**Q9.** Directions at your school (VC2HG4K05 .E05). Think of your real school — your place. Pick four landmarks you can see from the gate (a building, the oval, a big tree, the bike racks). For each one, write which way it is from the gate: north, south, east or west. If you can, check outside with a compass or the sun.

**Q10.** Projection detective (VC2HG4K05 .E03). Look at the two world maps, Mercator and Robinson, and at the true-size picture of Africa and Greenland. Find Greenland on both world maps. In two sentences, say which map makes Greenland look too big, and how you can tell.

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### **Possible answers**

*Answers will be different in every class. These show the shape of a good response.*

**Q1.** (1) Asia, Africa, North America, South America, Antarctica, Europe, Australia. (2) Six — every other continent is bigger than Australia. (3) Australia smallest; Asia biggest.

**Q2.** (1) Indian Ocean. (2) Pacific Ocean. (3) The Southern Ocean.

**Q3.** a–2, b–3, c–1, d–4.

**Q4.** (1) The tropical zone. (2) The temperate zone. (3) The polar zone. (4) The Tropic of Cancer and the Tropic of Capricorn.

**Q5.** (1) east. (2) south. (3) north. (4) south.

**Q6.** (1) The Southern Hemisphere. (2) Indian and Pacific. (3) “about 7.7 million square kilometres” is the size; “sits in the Southern Hemisphere” is the half; “west side” and “east side” are the directions.

**Q7.** Look for: all seven continents and five oceans labelled; the equator crossing the middle; the tropic crossing Australia; a star on Australia.

**Q8.** A good answer says something like: *Europe and Asia are one long piece of land, so joining them is fair. Our book uses seven because Australian school maps most often show seven, and because Europe and Asia feel like different parts of the world to the people who live there.*

**Q9.** Answers will match your real school. A good response uses the four direction words correctly and checks against a compass or the sun.

**Q10.** A good answer: *On the Mercator map, Greenland looks almost as big as Africa. The true-size picture shows Africa is about 14 times bigger, so the Mercator map is stretching lands far from the equator. The Robinson map shows Greenland much smaller, closer to the truth.*

---

*Next in Chapter 2: 2B* separates weather from climate and finds where the world's main climate types are — starting from the very zones this section put on the map.

## Climate: the main climate types and where they are

**Victorian Curriculum 2.0** — Geography, Levels 3–4. Code **VC2HG4K06**. The tasks below also cover the official extra notes **VC2HG4K06.E01–.E05**.

**Words to know:** each new word is explained in bold the first time it is used.

### Learn about climate

**Weather and climate are not the same thing (E01).** **Weather** is what the sky is doing right now — hot or cool, wet or dry, windy or calm. Weather changes from hour to hour and day to day. **Climate** is the pattern of weather in a place, added up over many years. Climate scientists use 30 years of records to work out a place's climate. One rainy day in a dry place is weather. A place that is dry year after year has a dry climate.

## Weather is one day — climate is the pattern

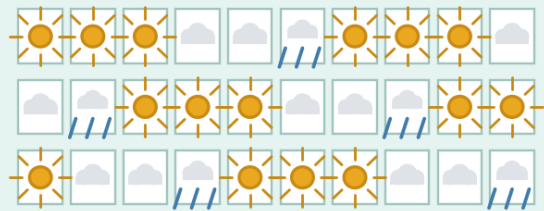
### WEATHER — one day, one place



Tuesday in Melbourne:  
rain in the morning,  
sun by lunch time, 18 °C

**Weather is what the sky does today.**

### CLIMATE — many years together



30 years of weather in Melbourne  
show the same shape every year.

**Climate is what you usually expect.**

**Climate: the usual pattern of weather in a place, over many years**

*Two panels. Left: one day of weather, drawn as today's sky cards. Right: climate, drawn as many years of weather cards grouped together. A strip along the bottom reads: climate is the usual pattern of weather in a place, over many years.*

**The six main climate types (E02).** Most of the land on Earth sits in one of six climate types.

## The six main climate types

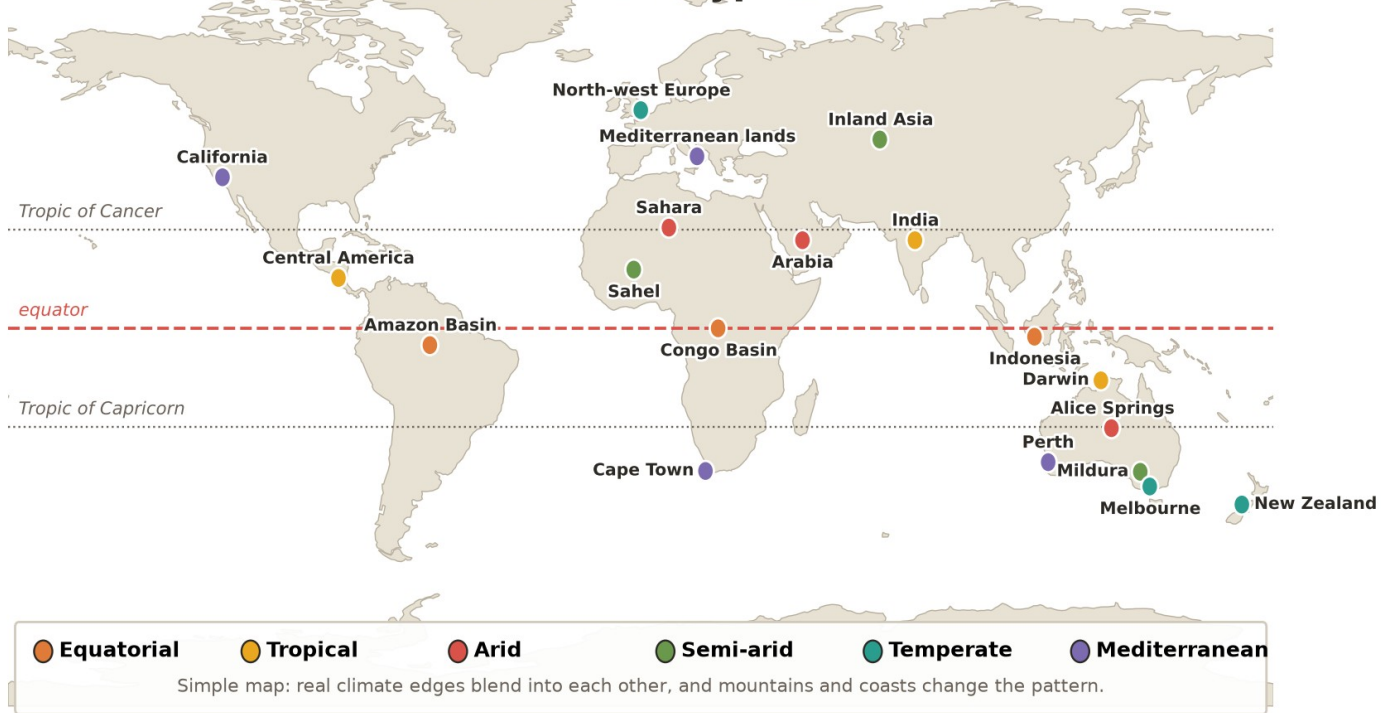
| Type                                                                                                   | What it is like                                                                  | Where you find it                                                                                   |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|  <b>Equatorial</b>    | Hot every month.<br>Very heavy rain,<br>on most days.                            | Near the equator: the Amazon, the<br>Congo, South-East Asia. In Australia:<br>the tip of Cape York. |
|  <b>Tropical</b>      | Hot all year.<br>A wet season with storms,<br>then a long dry season.            | Northern Australia: Darwin<br>and Cairns. Also India,<br>Brazil and parts of Africa.                |
|  <b>Arid</b>          | Very little rain.<br>Hot days.<br>Cool to cold nights.                           | The middle of Australia:<br>Alice Springs. Also the<br>Sahara and Arabia.                           |
|  <b>Semi-arid</b>     | Not much rain — a little more<br>than arid lands. Hot summers,<br>cool winters.  | The lands around the arid middle<br>of Australia, such as Mildura.<br>Also the Sahel in Africa.     |
|  <b>Temperate</b>     | Warm summers, cool winters.<br>Some rain in every season.<br>Four clear seasons. | South-east Australia: Melbourne<br>and Hobart. Also New Zealand<br>and north-west Europe.           |
|  <b>Mediterranean</b> | Hot, dry summers.<br>Mild, wet winters.                                          | Around Perth and Adelaide.<br>Also the lands by the<br>Mediterranean Sea.                           |

Names in bold are the ones this section uses. Places are examples, not a full list.

*A table of the six main climate types. For each type it tells what the climate is like and where on Earth you find it, with an example place in Australia for each.*

The map below marks real places for each type. Notice the bands around the **equator** — the imaginary line around the middle of the Earth. Equatorial climate hugs the equator. Tropical climate sits just outside it. Arid and semi-arid lands often sit near the two **tropics** — the Tropic of Cancer north of the equator and the Tropic of Capricorn south of it. Mediterranean and temperate climates sit further out, in the cooler bands.

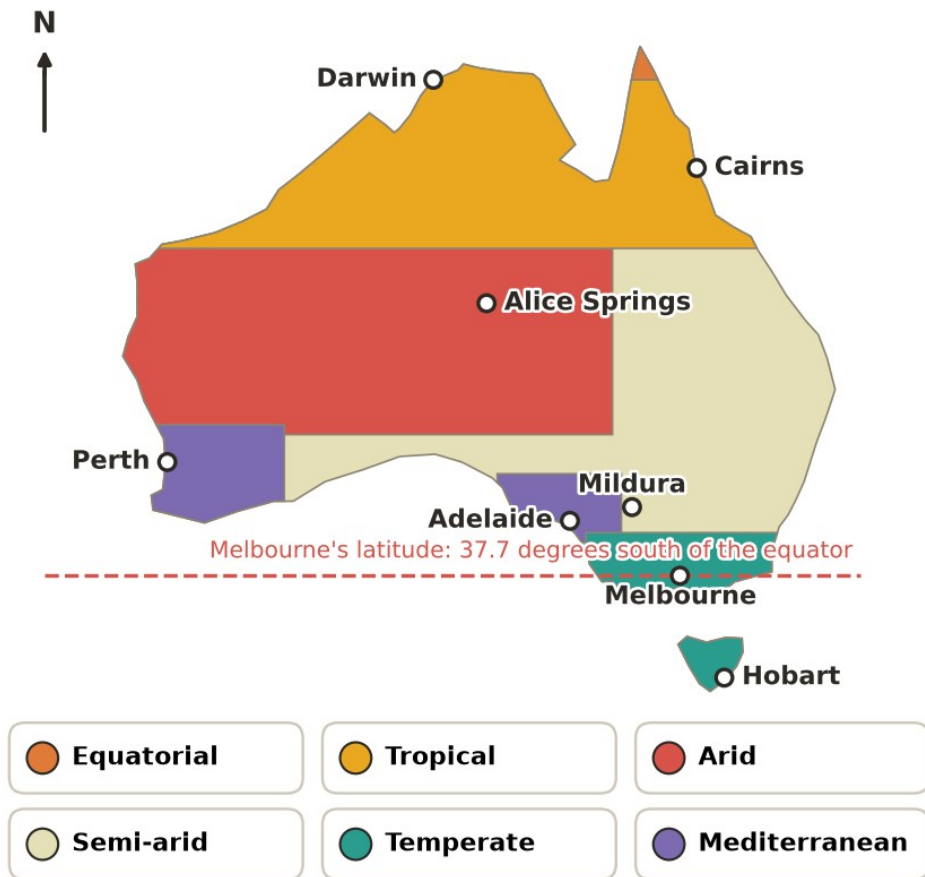
## Where the six climate types sit on Earth



*A simple world map with the equator and the two tropics drawn as lines. Coloured dots mark example places for each climate type, such as the Amazon Basin, the Sahara, California, Perth, Melbourne and New Zealand.*

**Australia has all six types (E02).** Look at the map below. The tropical band crosses the north. The arid middle covers the largest area, with semi-arid land around it. The south-west corner and the land near Adelaide are Mediterranean. The south-east, with Tasmania, is temperate. Only the very tip of Cape York is equatorial.

# Climate regions of Australia (simple map)



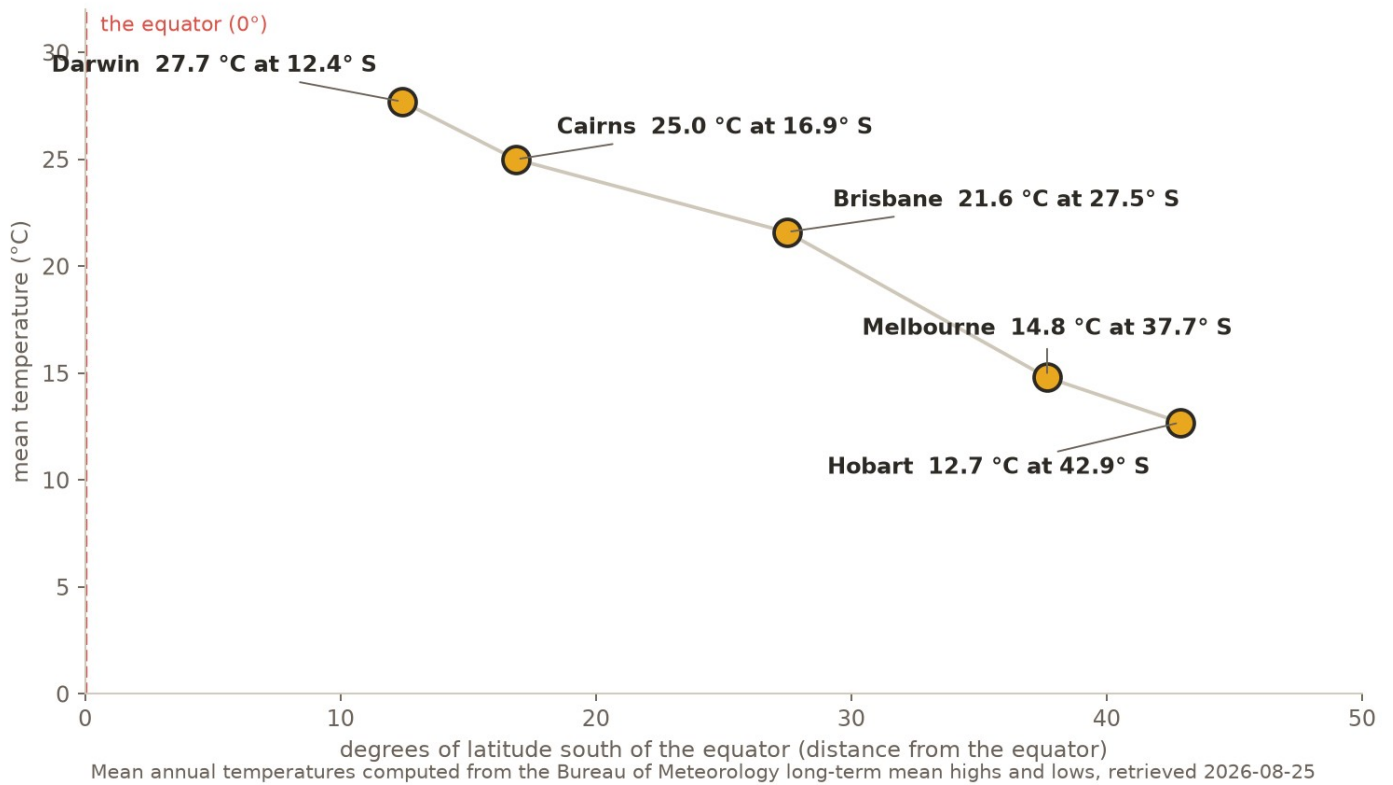
The edges blend slowly — a region line on a map is only a guide, and high ground and coasts change it.

*A simple map of Australia coloured by climate region: tropical north, arid middle, semi-arid lands around it, Mediterranean in the south-west and near Adelaide, temperate in the south-east, and a tiny equatorial tip on Cape York. Eight places are named, and a dashed line marks Melbourne's latitude.*

**Why is each climate where it is? (E04)** Two big reasons are **latitude** and **topography**.

**Latitude.** **Latitude** is how far a place is from the equator, measured in degrees. The chart below uses five real coastal cities, from Darwin at 12.4 degrees south to Hobart at 42.9 degrees south. Each dot shows the city's **average** temperature for a whole year — the number you get by adding all the days together and sharing them out so each day gets the same. The BoM calls this the *mean*. The closer to the equator, the hotter the place. The further away, the cooler.

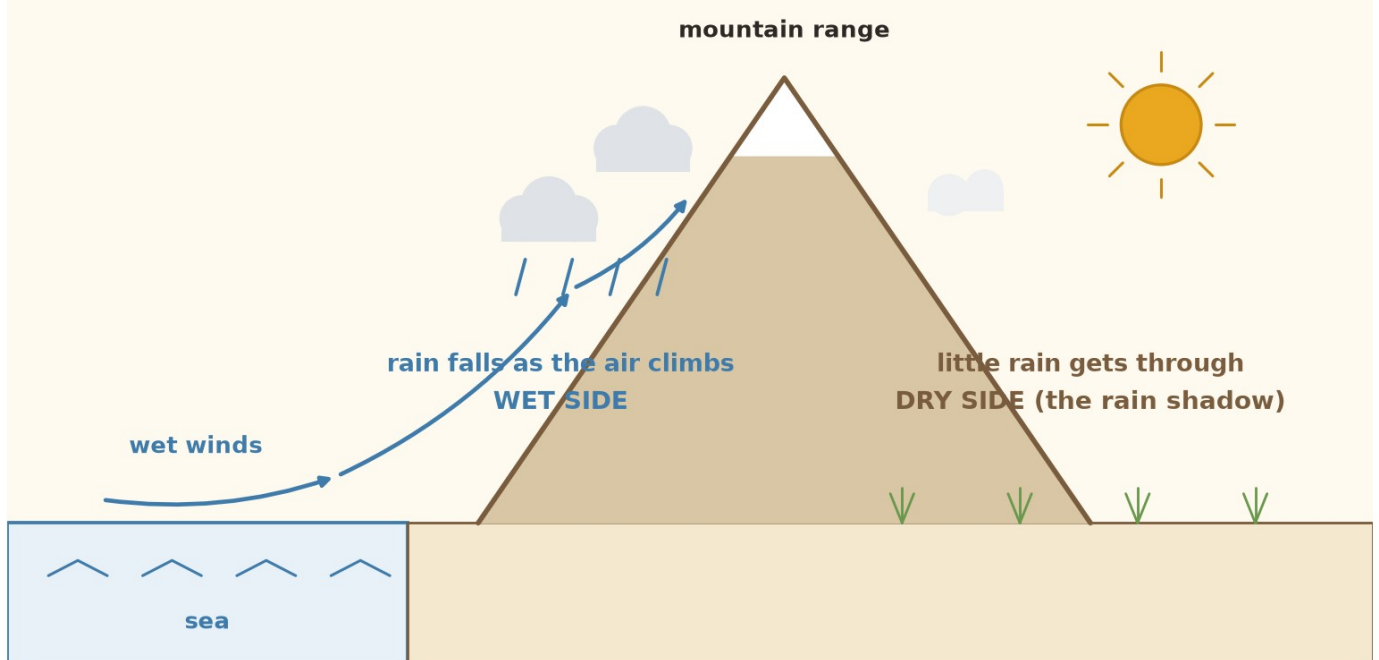
## The further from the equator, the cooler the place



A line chart titled “The further from the equator, the cooler the place”. Five dots fall in a gentle slope: Darwin 27.7 degrees C at 12.4 degrees south, then Cairns, Brisbane, Melbourne, and Hobart 12.7 degrees C at 42.9 degrees south.

**Topography.** **Topography** is the shape of the land — its mountains, hills and plains. When wet wind hits a mountain range, the air climbs, and its rain falls on the near side. The land behind the range gets very little rain. That dry land is called a **rain shadow**.

## How a mountain range takes the rain



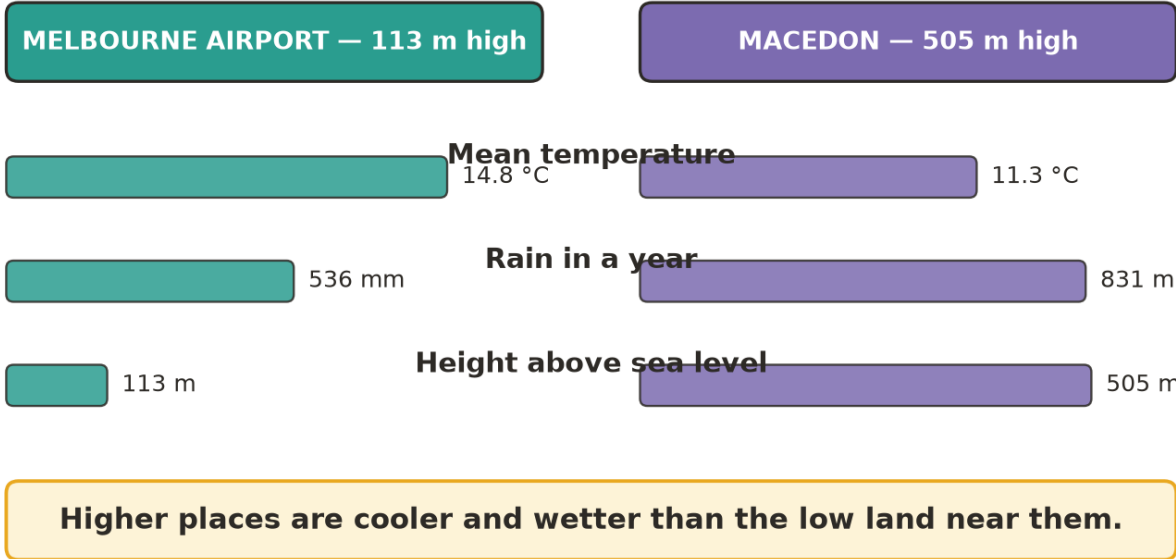
A rain shadow is the dry land behind a range. Example: wet coast east of Australia's Great Dividing Range, drier land west of it.

A diagram of a mountain range beside the sea. Wet winds climb the near side and drop their rain there, marked **WET SIDE**. Behind the range the land is sunny and dry, marked **DRY SIDE**, the rain shadow.

Height changes climate too. The higher you go, the cooler and wetter it gets. Macedon and Melbourne Airport sit at almost the same latitude, but Macedon is on high ground — so it is cooler and wetter. That is why snow can fall on Victoria’s high country while the city below stays warm.

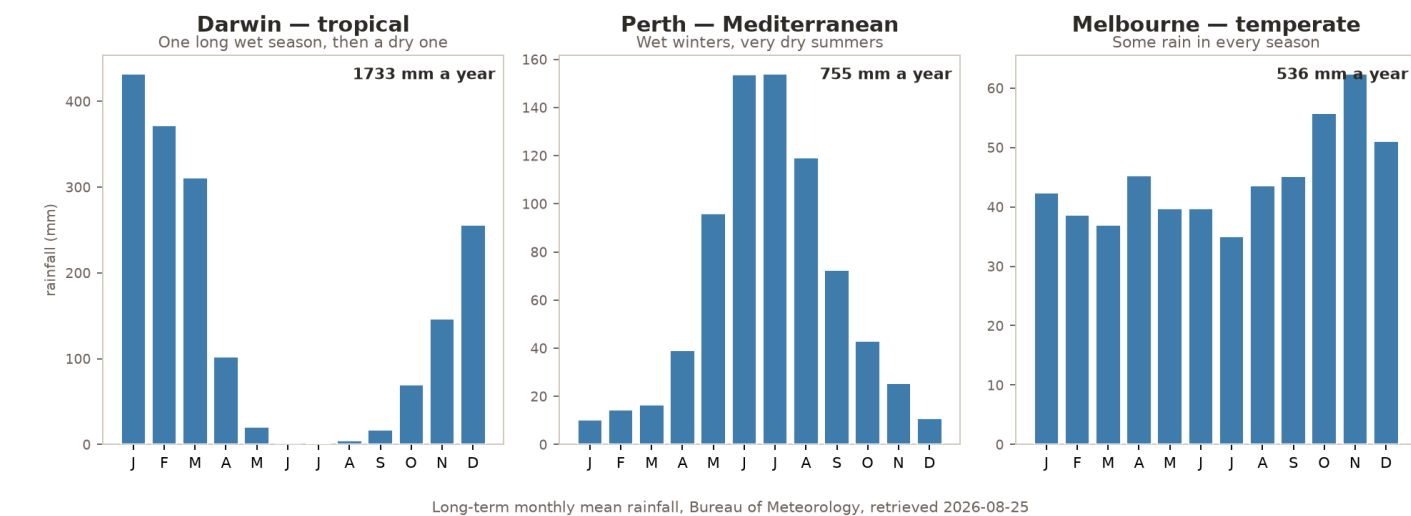
## Same latitude, different height

Melbourne Airport 37.7° S · Macedon 37.4° S — almost the same distance from the equator



A bar chart comparing Melbourne Airport (113 m high) with Macedon (505 m high) at almost the same latitude. Macedon has a cooler mean temperature (11.3 degrees C vs 14.8 degrees C) and more rain in a year (831 mm vs 536 mm).

**When the rain falls (E04).** Two places can get the same rain in a year but in different seasons. The graphs below show three real patterns: Darwin gets almost all of its rain in the summer wet season; Perth gets most of its rain in winter; Melbourne gets some rain in every season. The season a place gets its rain is part of its climate too.



Three bar charts of monthly rainfall. Darwin has tall bars from November to April and almost no rain from May to October. Perth has tall bars in June, July and August and tiny bars in summer. Melbourne has bars of similar height all year.

## Source to read: a year in Alice Springs (E03)

Read this short source card, then answer the questions below it.

**Alice Springs Airport, Northern Territory** — in the arid middle of Australia.

- Average temperature for the year: **21.1 °C**
- Rain in a year: **283.8 mm** (Melbourne Airport gets 536.2 mm)
- Days with rain in a year: about **29** (that is less than one a fortnight)
- Clear days in a year: about **199**
- Hot summer days and cool-to-cold winter nights are normal.

Source: Bureau of Meteorology, site 015590 [S5], retrieved 2026-08-25.

1. About how many days a year have rain at Alice Springs?
2. Alice Springs and Melbourne Airport are both in Australia. Use the numbers to give one way their climates differ.
3. Would you need a warm jumper for some nights in Alice Springs? Use the card to explain your answer.

## Worked examples

**Worked example 1 — reading a climate table (E01, E02).** Use the table below, which shows Melbourne Airport's long-term averages, month by month.

### Melbourne Airport's climate — long-term averages

| Month                      | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  |
|----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Mean high temperature (°C) | 26.7 | 26.7 | 24.3 | 20.4 | 16.7 | 13.7 | 13.2 | 14.6 | 16.9 | 19.6 | 22.1 | 24.7 |
| Mean low temperature (°C)  | 14.0 | 14.2 | 12.8 | 10.2 | 8.2  | 6.2  | 5.5  | 5.9  | 7.1  | 8.6  | 10.5 | 12.1 |
| Mean rainfall (mm)         | 42.4 | 38.6 | 36.9 | 45.3 | 39.7 | 39.7 | 35.0 | 43.6 | 45.2 | 55.7 | 62.4 | 51.0 |

**A year adds up to 536.2 mm of rain; the mean temperature for the year is 14.8 °C.**

Bureau of Meteorology, site 086282, retrieved 2026-08-25

*A table of Melbourne Airport's long-term monthly averages: mean high temperature, mean low temperature and mean rainfall for each month, plus the year totals: 536.2 mm of rain and a mean temperature of 14.8 degrees C.*

*Step 1 — hottest and coldest months.* Read the top row (the mean high). The biggest number is 26.7 °C, in January and February. The smallest is 13.2 °C, in July. So summer is warm and winter is cool.

*Step 2 — the rain pattern.* Read the bottom row. Every month sits between 35.0 mm and 62.4 mm. Even the smallest month is 35.0 mm, so rain falls in every season.

*Step 3 — describe and name the climate.* Warm summers, cool winters, some rain in every season: that matches the **temperate** row of the six-types table. Melbourne Airport sits in Australia's temperate south-east — check it on the regions map above.

**Worked example 2 — same latitude, different height (E05).** Latitude is not the whole story. Macedon (37.4° S) and Melbourne Airport (37.7° S) are almost the same distance from the equator.

*Step 1 — compare the numbers.* Mean temperature: 11.3 °C at Macedon, 14.8 °C at the airport — Macedon is 3.5 °C cooler. Rain in a year: 831 mm at Macedon, 536.2 mm at the airport — Macedon is wetter.

*Step 2 — find the difference between the places.* The latitude is (almost) the same, so latitude cannot explain the gap. The height is different: 505 m above sea level vs 113 m.

*Step 3 — explain.* Higher places are cooler and wetter than the low land near them. Topography — not latitude — makes Macedon's climate different.

## Practice questions

**S1 — weather or climate? (E01)** Write *weather* or *climate* next to each sentence.

- a. "It rained on our sports day."
- b. "Victoria usually has its most rain in spring."
- c. "Darwin's wet season starts in November."
- d. "The wind blew my hat off this morning."
- e. "Alice Springs is dry year after year."
- f. "Tomorrow will be hot and sunny."

**S2 — match the type (E02).** Match each climate type (1–6) to its description (a–f).

1. Equatorial 2. Tropical 3. Arid 4. Semi-arid 5. Temperate 6. Mediterranean
- a. Hot, dry summers and mild, wet winters.
- b. Very little rain; hot days and cool-to-cold nights.
- c. Hot every month, with very heavy rain on most days.
- d. Warm summers, cool winters, and some rain in every season.
- e. A summer wet season with storms, then a long dry season.
- f. A little more rain than arid land; hot summers and cool winters.

**S3 — Australia's regions (E02).** Use the regions map of Australia. Name the climate type at each place.

- a. Darwin b. Alice Springs c. Mildura d. Perth e. Melbourne f. Hobart g. Cairns h. the tip of Cape York

**S4 — around the world (E02).** Use the world map. For each climate type, name one place (not in Australia) where you find it.

- a. Equatorial b. Arid c. Mediterranean d. Temperate

**S5 — the latitude slope (E04).** Use the latitude chart.

- a. List the five cities from hottest to coolest.
- b. What happens to the average temperature as you move away from the equator?
- c. Which two cities are closest together in temperature?

**S6 — when the rain falls (E04).** Use the three rainfall graphs.

- a. Which city gets most of its rain in winter?
- b. Which city has a summer wet season?
- c. Which city gets some rain in every season?
- d. Name the climate type of each of the three cities.

## Challenge questions

**C1 (E04).** Darwin is hot all year — even in July, its coolest month. Use the idea of latitude to explain why.

**C2 (E03).** Pick one Mediterranean place from the world map that is not in Australia. Describe a whole year there: what are the summers like, what are the winters like, and what would you pack for each?

**C3 (E05).** Your town sits some number of degrees south of the equator. Use a world map or atlas in class to find a place the same number of degrees **north** of the equator. Predict whether its climate will be the same as yours or different, and give two reasons for your prediction.

**C4 (E04).** Some winters, snow falls at Macedon but not at Melbourne Airport, even though the two places are almost the same distance from the equator. Use the numbers in the height chart to explain why.

## Answers

**Source to read.** 1. About 29 days. 2. Any true difference using the numbers, e.g. Alice Springs gets much less rain in a year than Melbourne Airport (283.8 mm vs 536.2 mm), and far fewer rain days. 3. Yes — the card says winter nights are cool to cold, so a warm jumper is needed on winter nights even though summer days are hot.

**S1.** a. weather b. climate c. climate d. weather e. climate f. weather

**S2.** 1–c, 2–e, 3–b, 4–f, 5–d, 6–a

**S3.** a. tropical b. arid c. semi-arid d. Mediterranean e. temperate f. temperate g. tropical h. equatorial

**S4.** Examples: a. the Amazon Basin (or the Congo, Indonesia) b. the Sahara (or Arabia) c. California (or Cape Town, the Mediterranean lands) d. New Zealand (or north-west Europe)

**S5.** a. Darwin, Cairns, Brisbane, Melbourne, Hobart. b. It gets cooler — the further from the equator, the lower the average temperature. c. Melbourne (14.8 °C) and Hobart (12.7 °C).

**S6.** a. Perth. b. Darwin. c. Melbourne. d. Darwin — tropical; Perth — Mediterranean; Melbourne — temperate.

**C1.** Darwin sits at 12.4° S, close to the equator, where the sun is high in the sky all year. Places near the equator stay hot in every season, so even Darwin's coolest month is hot.

**C2.** Any Mediterranean place with a matching description: hot, dry summers and mild, wet winters — e.g. California: pack a sun hat and light clothes for summer, and a rain jacket and jumper for winter.

**C3.** Answers will vary. A place at the same latitude is the same distance from the equator, so its average temperature may be close — but topography (mountains, rain shadows) and the season of rain can make its climate different. Two clear reasons earn the marks.

**C4.** Macedon is 505 m above sea level and the airport is 113 m. Higher places are cooler, so Macedon's mean temperature is only 11.3 °C vs 14.8 °C — cold enough for snow on winter days when the low land is a few degrees hotter.

## Worked steps

**S5, step by step.** *Step 1:* read each dot on the chart: Darwin 27.7 °C, Cairns 25.0 °C, Brisbane 21.6 °C, Melbourne 14.8 °C, Hobart 12.7 °C. *Step 2:* order them from biggest to smallest: Darwin, Cairns, Brisbane, Melbourne, Hobart. *Step 3:* the cities also sit in order of latitude — 12.4°, 16.9°, 27.5°, 37.7°, 42.9° south. So as latitude grows (further from the equator), the average temperature falls. *Step 4:* the closest pair is Melbourne and Hobart: 14.8 – 12.7 = a difference of 2.1 °C.

**C1, step by step.** *Step 1:* latitude means distance from the equator in degrees; Darwin is 12.4° S, which is close. *Step 2:* near the equator the sun is high in the sky all year, so the land and sea stay hot all year — the chart shows the near-equator end is the hot end. *Step 3:* seasons near the equator change rain more than heat, so Darwin's "winter" is a dry season, not a cold one. *Conclusion:* Darwin's low latitude is why it is hot in every month.

## Sources

Every number in this section is a long-term average published by the Australian Bureau of Meteorology, retrieved 2026-08-25. Mean temperatures for the year are worked out as (mean high + mean low) ÷ 2.

- **[S1]** Bureau of Meteorology, "Climate statistics for Australian locations — MELBOURNE AIRPORT", site 086282 (37.67° S, 144.83° E, 113 m), [http://www.bom.gov.au/climate/averages/tables/cw\\_086282.shtml](http://www.bom.gov.au/climate/averages/tables/cw_086282.shtml)
- **[S2]** Bureau of Meteorology, "Climate statistics for Australian locations — DARWIN AIRPORT", site 014015 (12.42° S, 130.89° E, 30 m), [http://www.bom.gov.au/climate/averages/tables/cw\\_014015.shtml](http://www.bom.gov.au/climate/averages/tables/cw_014015.shtml)
- **[S3]** Bureau of Meteorology, "Climate statistics for Australian locations — MILDURA AIRPORT", site 076031 (34.24° S, 142.09° E, 50 m), [http://www.bom.gov.au/climate/averages/tables/cw\\_076031.shtml](http://www.bom.gov.au/climate/averages/tables/cw_076031.shtml)
- **[S4]** Bureau of Meteorology, "Climate statistics for Australian locations — CAIRNS AERO", site 031011 (16.87° S, 145.75° E, 2 m), [http://www.bom.gov.au/climate/averages/tables/cw\\_031011.shtml](http://www.bom.gov.au/climate/averages/tables/cw_031011.shtml)

- **[S5]** Bureau of Meteorology, “Climate statistics for Australian locations — ALICE SPRINGS AIRPORT”, site 015590 (23.80° S, 133.89° E, 546 m), [http://www.bom.gov.au/climate/averages/tables/cw\\_015590.shtml](http://www.bom.gov.au/climate/averages/tables/cw_015590.shtml)
- **[S6]** Bureau of Meteorology, “Climate statistics for Australian locations — PERTH AIRPORT M.O.”, site 009021 (31.93° S, 115.98° E, 15 m), [http://www.bom.gov.au/climate/averages/tables/cw\\_009021.shtml](http://www.bom.gov.au/climate/averages/tables/cw_009021.shtml)
- **[S7]** Bureau of Meteorology, “Climate statistics for Australian locations — HOBART (ELLERSLIE ROAD)”, site 094029 (42.89° S, 147.33° E, 51 m), [http://www.bom.gov.au/climate/averages/tables/cw\\_094029.shtml](http://www.bom.gov.au/climate/averages/tables/cw_094029.shtml)
- **[S8]** Bureau of Meteorology, “Climate statistics for Australian locations — BRISBANE”, site 040913 (27.48° S, 153.04° E, 8 m), [http://www.bom.gov.au/climate/averages/tables/cw\\_040913.shtml](http://www.bom.gov.au/climate/averages/tables/cw_040913.shtml)
- **[S9]** Bureau of Meteorology, “Climate statistics for Australian locations — MACEDON FORESTRY”, site 087036 (37.42° S, 144.56° E, 505 m), [http://www.bom.gov.au/climate/averages/tables/cw\\_087036.shtml](http://www.bom.gov.au/climate/averages/tables/cw_087036.shtml)

## How climate and vegetation fit together

Victorian Curriculum 2.0 — Geography, Levels 3–4. Code VC2HG4K07.

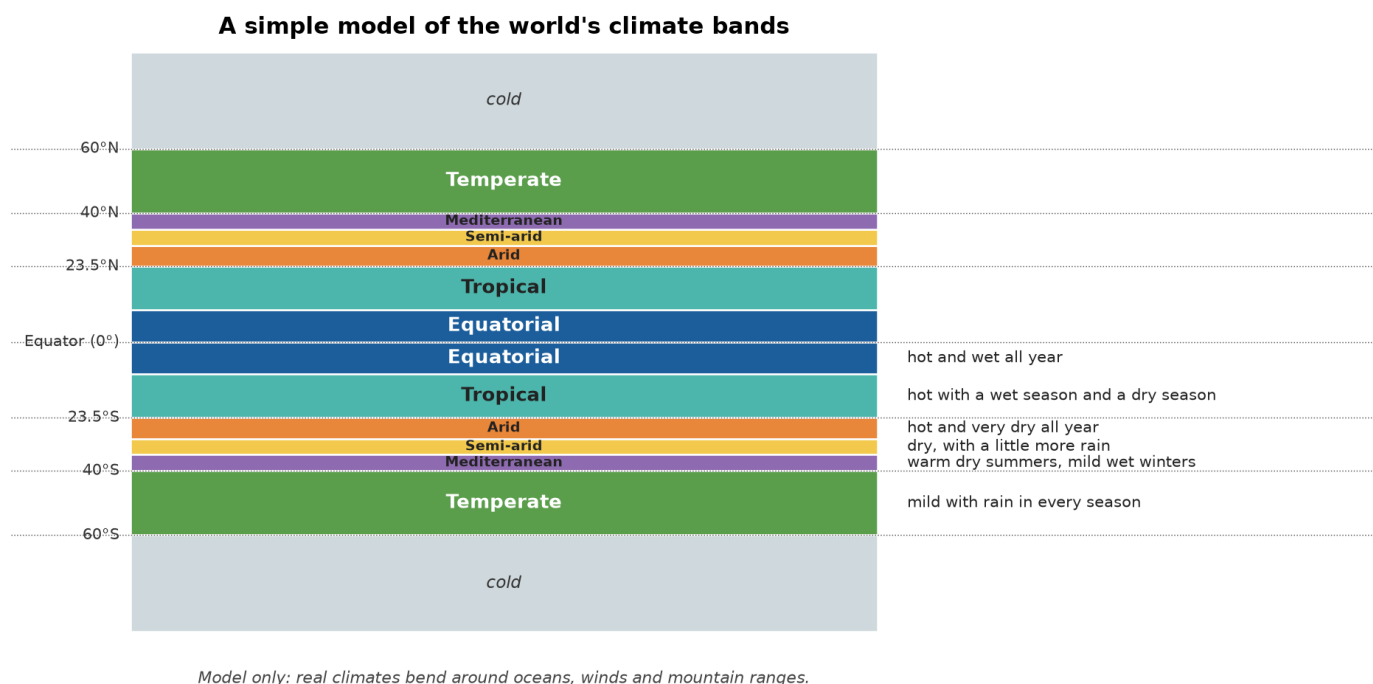
**Draws on:** VC2HG4K07.E01, VC2HG4K07.E02

This section joins two maps you have already met in this book: the world's climate types (2B) and the world's vegetation types (1D). Lay one map on top of the other and the patterns match. That match is the big idea of this section.

### What we are learning

**The two maps you need.** In 2B you met the six main climate types of the world: **equatorial, tropical, arid, semi-arid, temperate** and **Mediterranean**. In 1D you met the five main vegetation types: **forest, woodland, savannah, grassland** and **desert**. *Vegetation* means the plants that grow in a place. *Climate* means the weather pattern a place has over many years, not just one week.

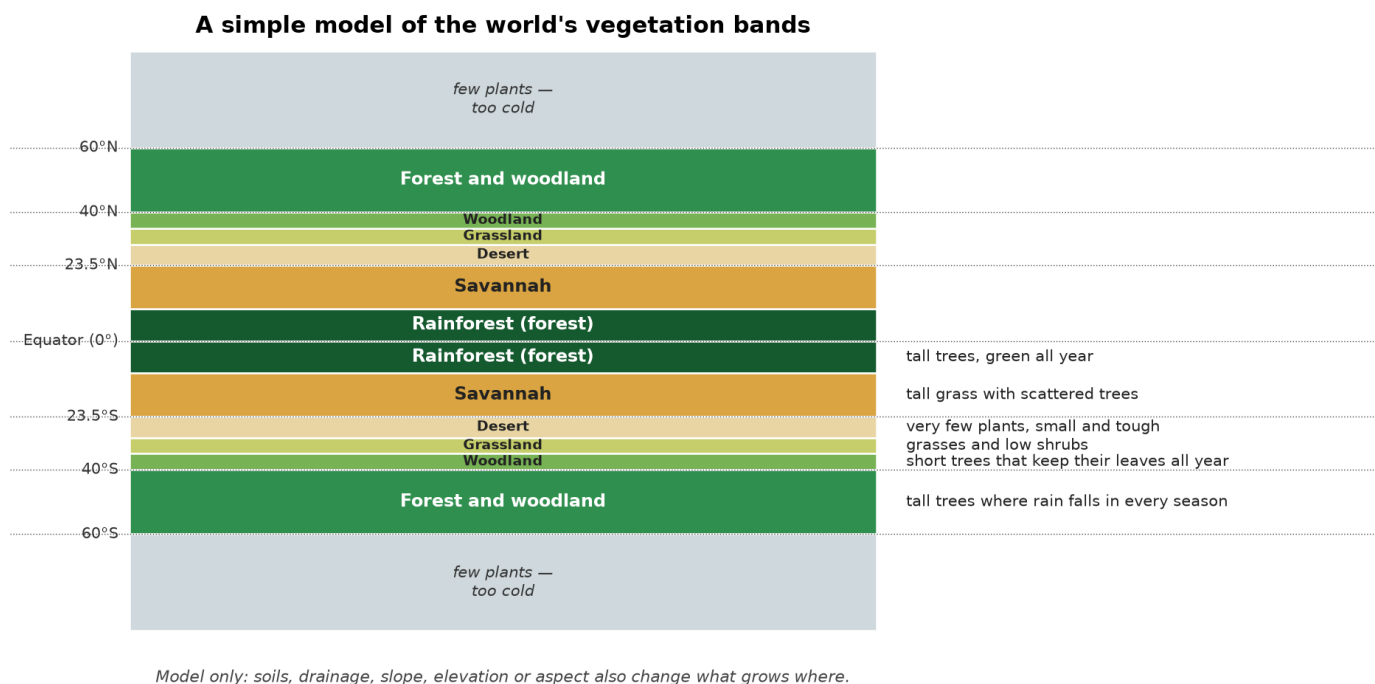
Figure 1 shows the climate types as bands around the Earth. **Latitude** means how far north or south a place is from the equator, measured in degrees (°). The bands sit at much the same latitudes in both hemispheres (the halves of the Earth north and south of the equator).



*A simple model of the world's climate bands shown as coloured stripes mirrored above and below the equator: equatorial at 0 to 10 degrees, tropical to 23.5 degrees, arid to 30 degrees, semi-arid to 35 degrees, Mediterranean to 40 degrees, temperate to 60 degrees, then cold polar caps*

*Figure 1 — A simple model of the world's climate bands. A model only: real climates bend around oceans, winds and mountain ranges.*

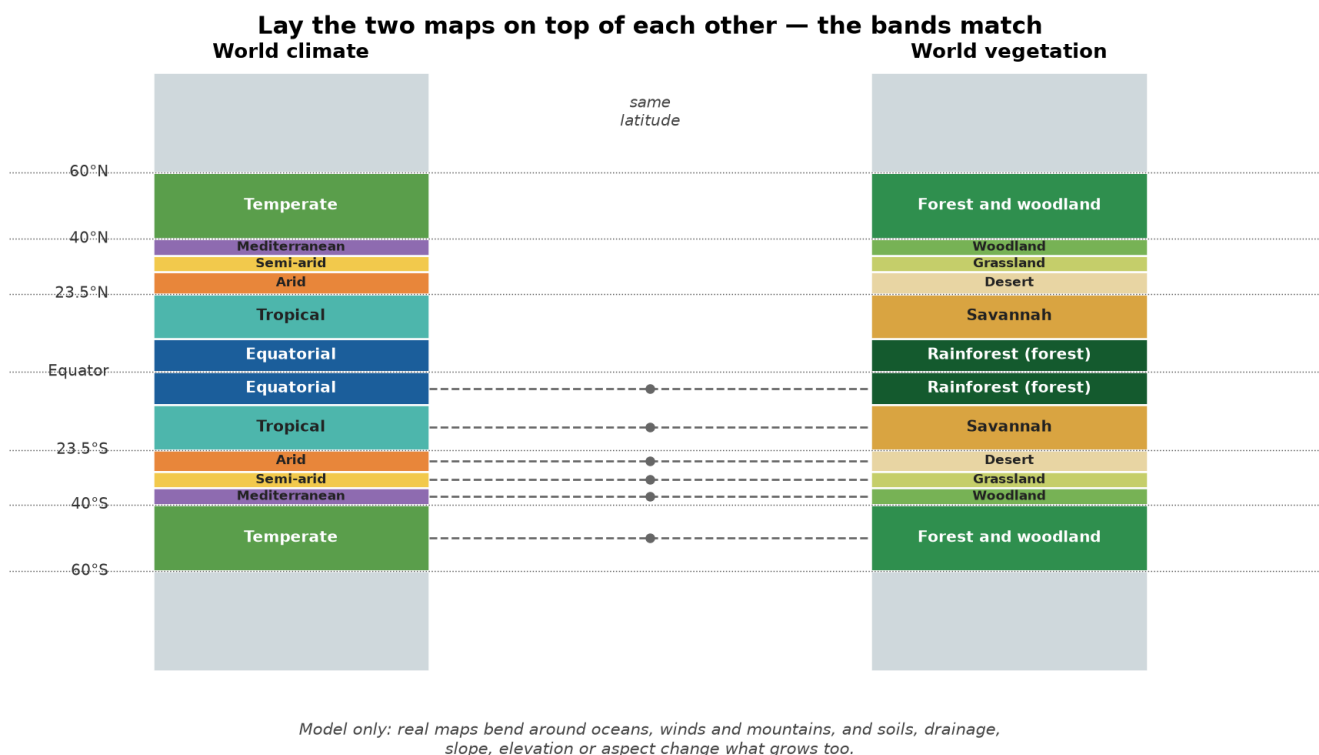
Figure 2 shows the vegetation types on the same bands.



*A simple model of the world's vegetation bands on the same latitude stripes: rainforest at 0 to 10 degrees, savannah to 23.5 degrees, desert to 30 degrees, grassland to 35 degrees, woodland to 40 degrees, forest and woodland to 60 degrees, then few plants in the cold polar caps*

Figure 2 — A simple model of the world's vegetation bands, drawn on the same stripes as Figure 1.

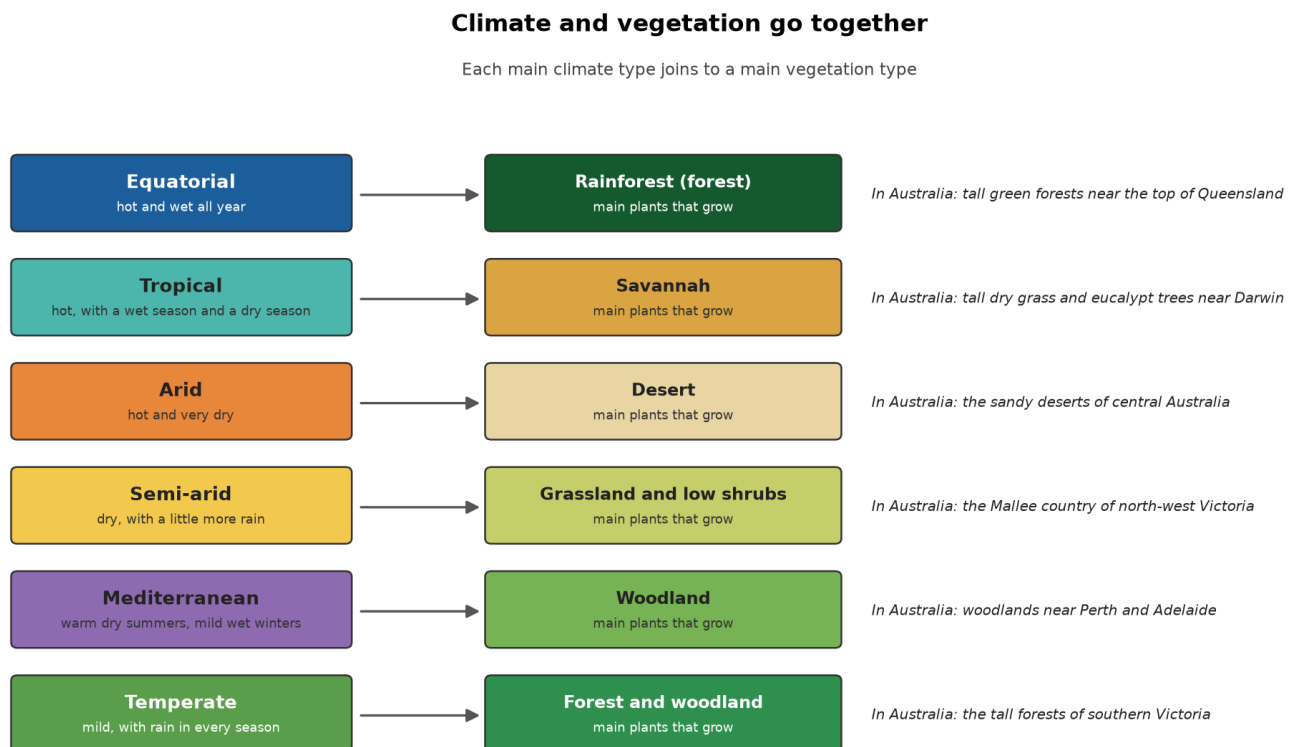
**Lay the two maps on top of each other.** Now the key move of this section (.E01): take a world climate map and a world vegetation map, line them up by latitude, and look. The bands match (Figure 3). Hot and wet all year goes with rainforest. Hot with a wet season and a dry season goes with savannah. Very dry goes with desert. And so on. Climate and vegetation are interconnected: the climate of a place goes a long way to deciding what grows there.



*Two coloured strips side by side, the world climate bands on the left and the world vegetation bands on the right, joined band by band at the same latitudes with dashed lines to show they match*

Figure 3 — Line the two maps up by latitude and the bands match.

Figure 4 pairs each climate type with its vegetation type and gives a real Australian example of each pair.



Matching diagram with six rows: equatorial joins to rainforest with the example of tall green forests near the top of Queensland; tropical to savannah near Darwin; arid to the deserts of central Australia; semi-arid to grassland and low shrubs in the Mallee country of north-west Victoria; Mediterranean to woodlands near Perth and Adelaide; temperate to the tall forests of southern Victoria

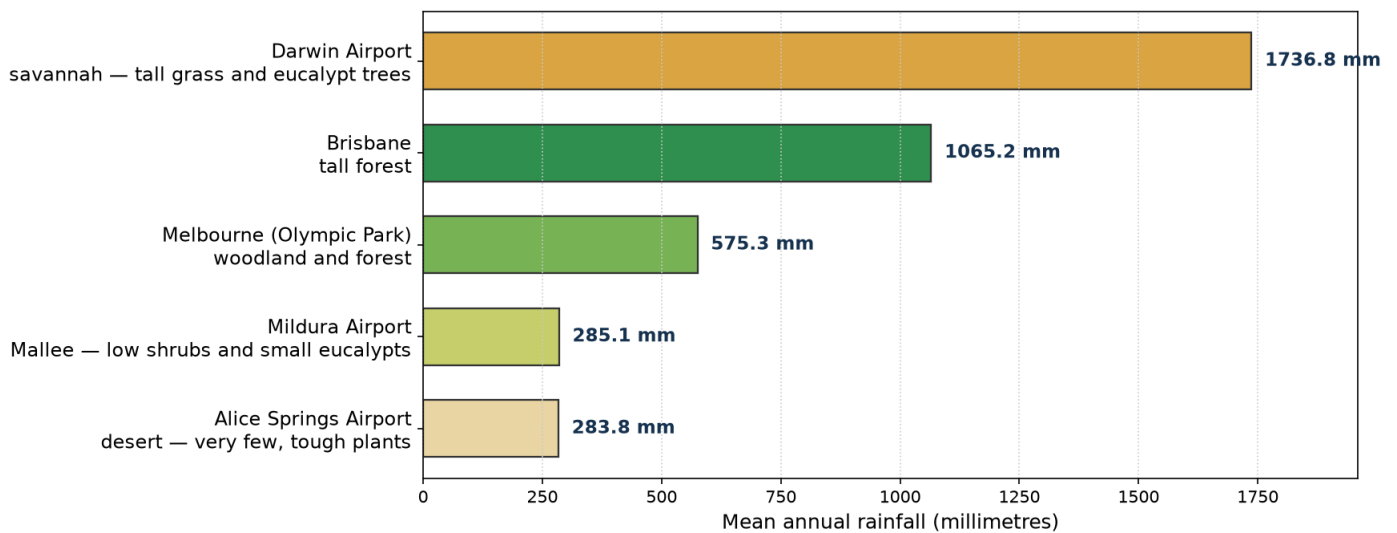
Figure 4 — Each main climate type joins to a main vegetation type, with a real Australian example.

**Why do the bands match?** Plants need water and warmth in the right amounts:

- **Hot and wet all year** (equatorial) — trees never run out of water, so tall **rainforest** grows.
- **Hot with a wet season and a dry season** (tropical) — grass grows tall in the wet months and dries off in the dry months, with scattered trees: **savannah**.
- **Very dry all year** (arid) — only a few tough plants survive: **desert**.
- **Dry with a little more rain** (semi-arid) — **grassland** and low shrubs.
- **Warm dry summers, mild wet winters** (Mediterranean) — **woodland** of short, tough trees.
- **Mild with rain in every season** (temperate) — **forest and woodland**, because trees get water all year.

**Rain and plants in real places.** Figure 5 uses real Bureau of Meteorology numbers. The pattern is plain to see: more rain, more plants.

### More rain, more plants — five real Australian stations



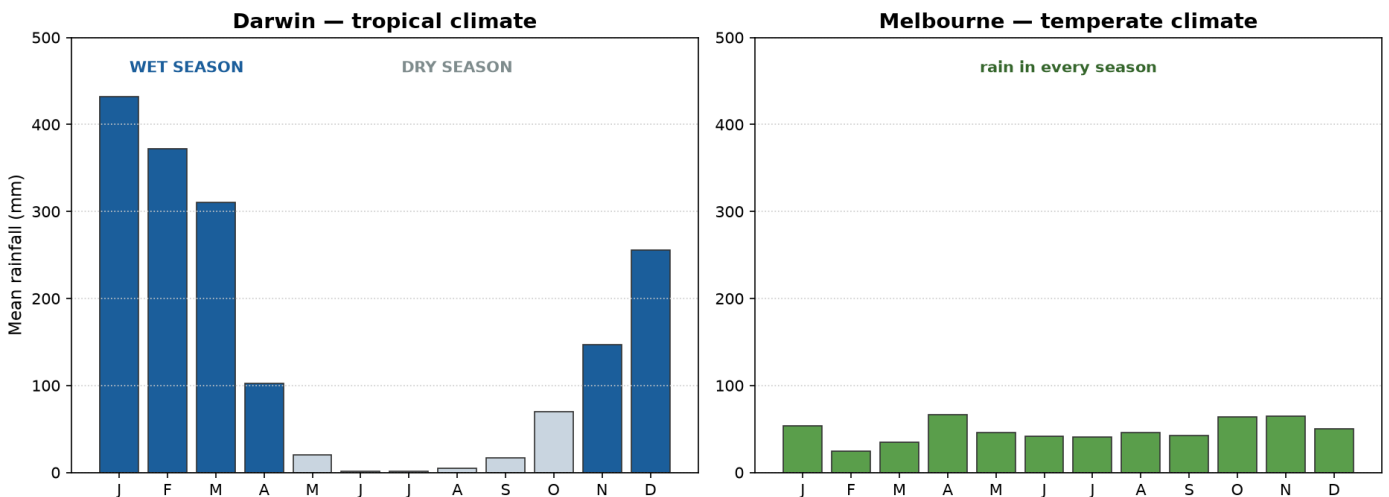
Data: Bureau of Meteorology long-term averages, retrieved 25 August 2026.

Horizontal bar chart of mean annual rainfall at five real Australian stations, each labelled with its main vegetation: Alice Springs Airport 283.8 mm desert, Mildura Airport 285.1 mm Mallee low shrubs and small eucalypts, Melbourne 575.3 mm woodland and forest, Brisbane 1065.2 mm tall forest, Darwin Airport 1736.8 mm savannah

Figure 5 — More rain, more plants. Data: Bureau of Meteorology long-term averages, retrieved 25 August 2026.

**Two real rain patterns.** Darwin has a tropical climate: heavy rain from November to April (the Wet), then almost no rain from May to October (the Dry). That on-off water supply grows savannah, not rainforest. Melbourne has a temperate climate: rain falls in every month, so trees never run out of water and forest and woodland grow (Figure 6).

### Two real rainfall patterns — BOM long-term averages (retrieved 25 August 2026)



Two bar charts of mean monthly rainfall side by side: Darwin with tall blue bars from November to April and almost no rain from May to October, labelled wet season and dry season; Melbourne with small green bars in every month, labelled rain in every season

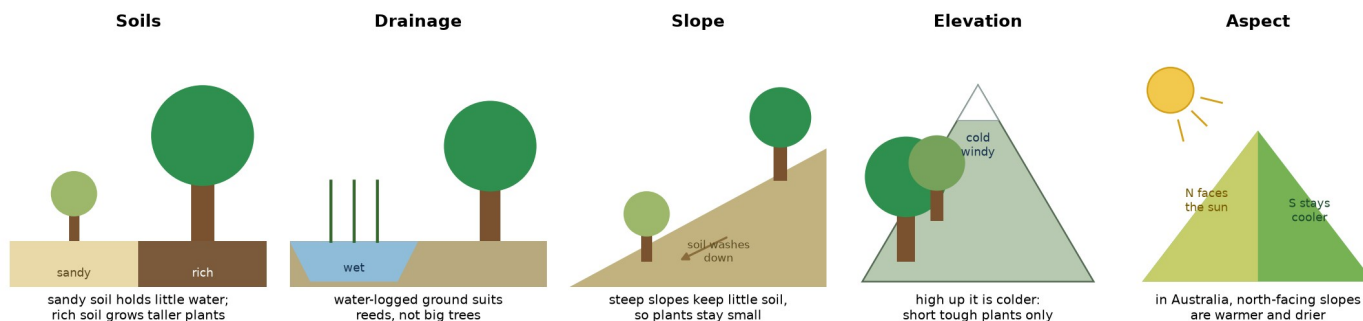
Figure 6 — Darwin's tropical wet and dry seasons beside Melbourne's temperate all-year rain. Data: Bureau of Meteorology, retrieved 25 August 2026.

**Climate is not the only thing.** Note .E01 also asks what *else* changes what grows in a place. Five other things matter:

- **Soils** — sandy soil holds little water, so plants stay small; rich soil grows taller plants.

- **Drainage** — how well water runs away. Water-logged ground suits reeds, not big trees.
- **Slope** — how steep the ground is. On steep slopes, soil washes down, so plants stay small.
- **Elevation** — how high a place is above sea level. High up, it is colder and windier, so only short, tough plants grow.
- **Aspect** — the way a slope faces. In Australia, north-facing slopes look at the sun, so they are hotter and drier than south-facing slopes.

#### Climate is not the only thing — five other things



Five small labelled panels: soils, showing a small plant on sandy soil and a taller one on rich soil; drainage, showing reeds in wet ground and a tree on dry ground; slope, showing soil washing down a steep slope; elevation, showing a mountain with short tough plants and a cold windy top; aspect, showing a hill with the sun-facing north side warm and dry and the south side cooler and greener

Figure 7 — Five things besides climate that change what grows in a place.

That is why the bands on real maps are ragged, not straight: two places at the same latitude can grow different plants because their soils, drainage, slope, elevation or aspect differ.

**Why cooler as you go south? Why cooler as you climb?** Note .E02 asks for the simple reasons:

- **Latitude.** Near the equator, the sun is high in the sky at midday, so its heat lands on a small patch of ground and heats it strongly. Far from the equator, the same heat arrives at a slant and spreads over a bigger patch, so the ground stays cooler. That is why, in Australia, the further south you go, the cooler it gets.
- **Elevation.** Air cools as it climbs: about **6.5 °C for every 1000 m** you go up. That is why mountain tops can hold snow even in a warm state.

**The effect on vegetation.** Because temperature falls with latitude, the vegetation bands of Figure 2 run from hot rainforest near the equator to cool forest far from it. Because temperature falls with elevation, climbing a tall mountain is like travelling away from the equator: the plants get shorter and tougher as you climb.

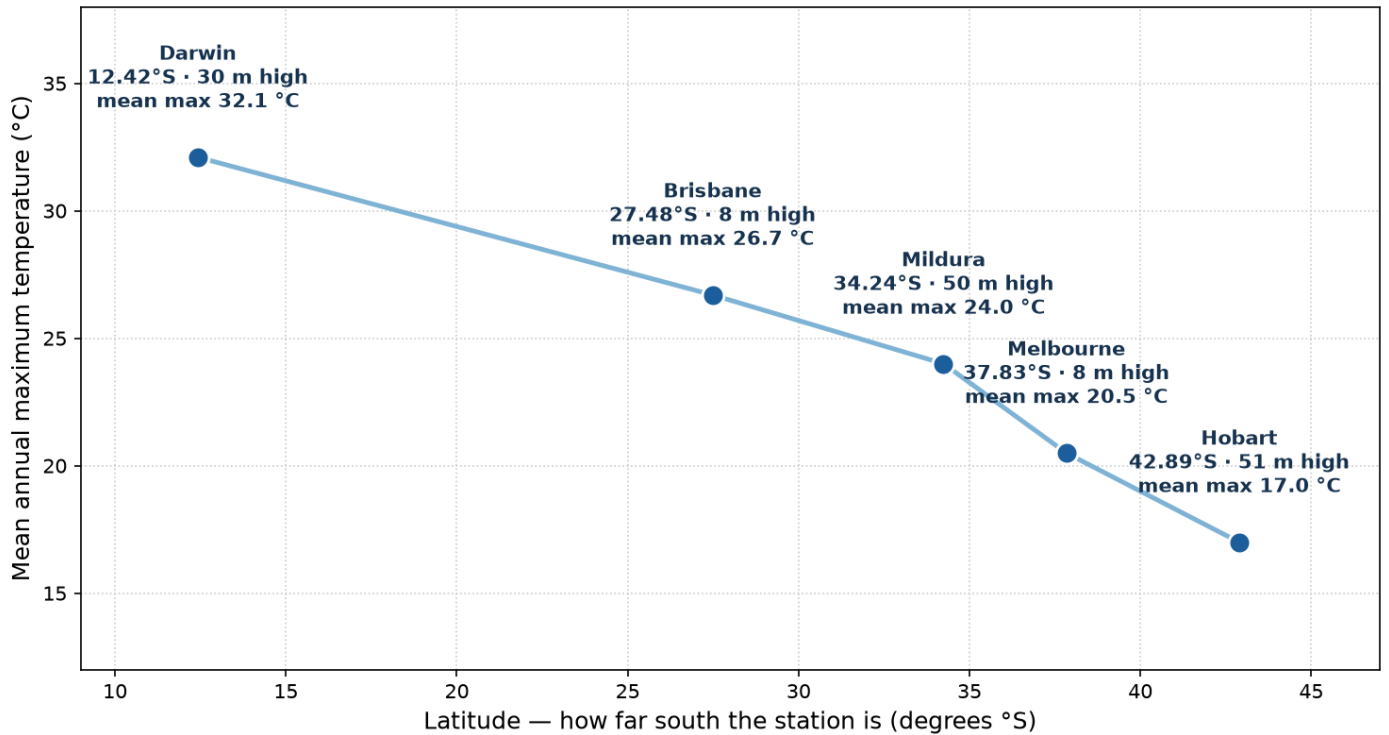
**Words to know.** *vegetation* — the plants that grow in a place; *climate* — the weather pattern of a place over many years; *latitude* — how far north or south a place is from the equator; *elevation (altitude)* — how high a place is above sea level; *slope* — how steep the ground is; *drainage* — how well water runs away from the ground; *aspect* — the way a slope faces; *savannah* — tall grass with scattered trees; *mean annual maximum temperature* — the average, over many years, of the hottest temperature each year.

## Worked examples

### Example 1 — step by step

Five real Australian weather stations sit near the coast, from Darwin in the north to Hobart in the south (Figures 8 and 9). Use the graph to connect latitude, temperature and vegetation.

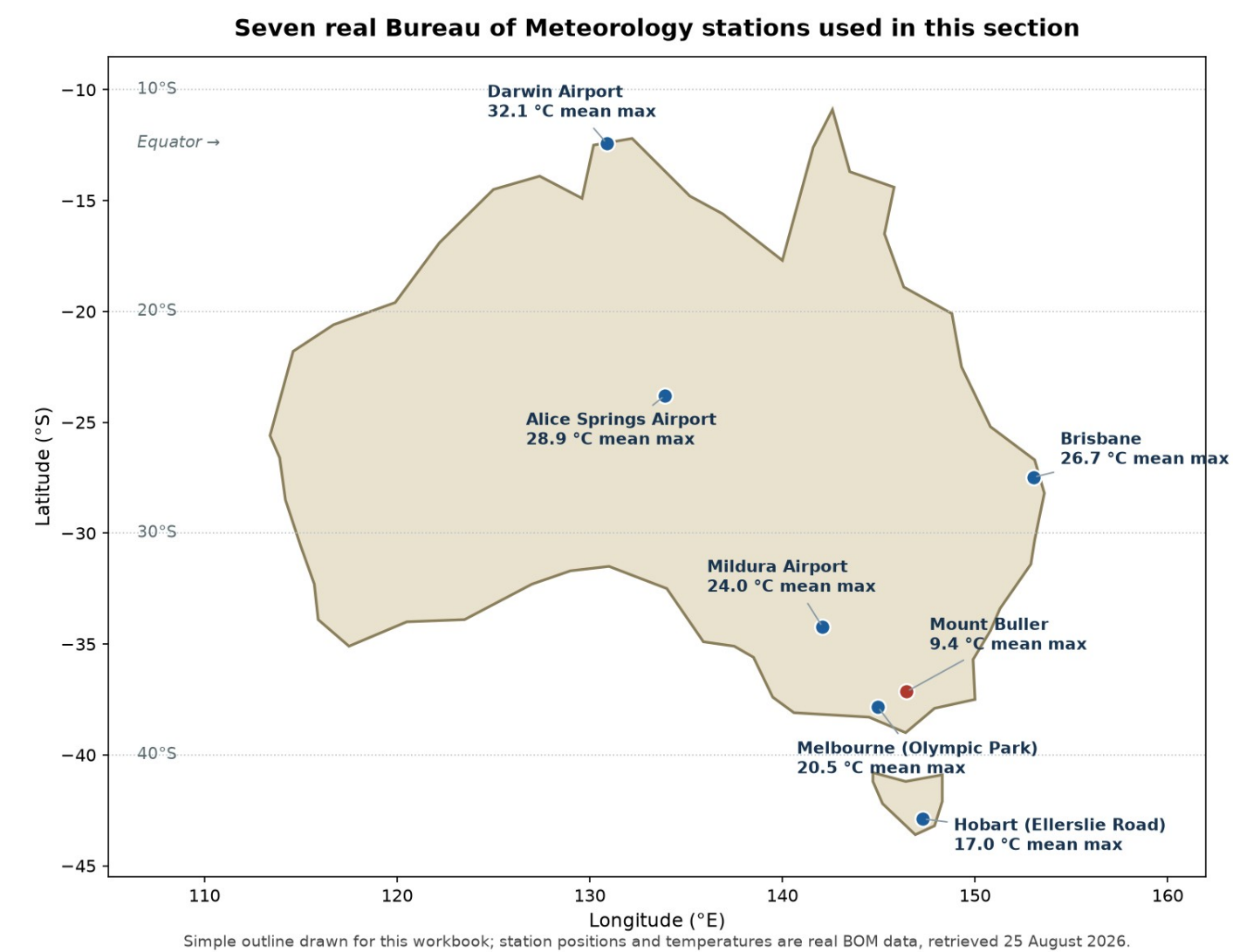
## The further south, the cooler — five real Australian stations



All five stations sit near sea level, so latitude shows clearly. Data: Bureau of Meteorology long-term averages, retrieved 25 August 2026.

*Line and point chart of five real coastal stations from Darwin at 12.42 degrees south with mean max 32.1 degrees to Hobart at 42.89 degrees south with mean max 17.0 degrees, showing temperature falling as latitude increases*

Figure 8 — The further south, the cooler. Data: Bureau of Meteorology long-term averages, retrieved 25 August 2026.



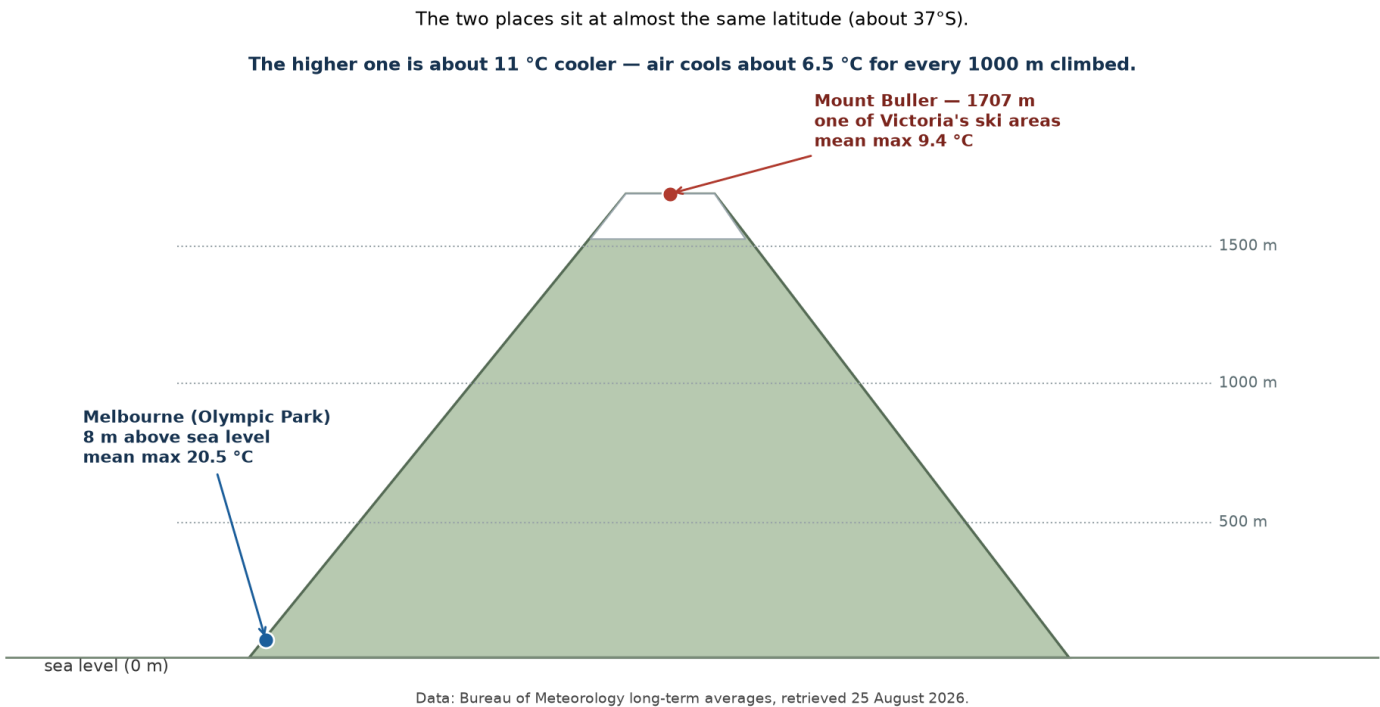
Simple outline map of Australia marking seven real Bureau of Meteorology stations at their true positions, each labelled with its mean annual maximum temperature, from Darwin 32.1 degrees in the north to Hobart 17.0 degrees in the south and Mount Buller 9.4 degrees in the Victorian Alps

Figure 9 — The seven real stations used in this section. Simple outline drawn for this workbook; positions and temperatures are real BOM data, retrieved 25 August 2026.

| Working                                                                                                                                                            | Comment                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Read the stations from north to south: Darwin (12.42°S), Brisbane (27.48°S), Mildura (34.24°S), Melbourne (37.83°S), Hobart (42.89°S).                             | Latitude is the number of degrees south of the equator — the bigger the number, the further south. |
| Read the mean annual maximum temperatures (the average, over many years, of the hottest temperature each year): 32.1 °C, 26.7 °C, 24.0 °C, 20.5 °C, 17.0 °C.       | Every station sits near sea level, so latitude — not elevation — is doing the work here.           |
| The pattern: the further south the station, the cooler its average temperature. Darwin to Hobart is about 30 degrees of latitude and 15.1 °C cooler (32.1 – 17.0). | This is the latitude rule of .E02: sun heat spreads out more the further you are from the equator. |
| Join to vegetation: hot Darwin (tropical) sits in savannah country; cool Hobart (temperate) sits among forest and woodland.                                        | Same interconnection as Figures 3 and 4, now shown with real numbers inside one country.           |

Example 2 — step by step

Melbourne (Olympic Park) and Mount Buller sit at almost the same latitude (about 37°S). Use Figure 10 to see what elevation does.



Labelled diagram of a mountain with two real stations at nearly the same latitude: Melbourne at 8 m above sea level with mean max 20.5 degrees, and Mount Buller at 1707 m, one of Victoria’s ski areas, with mean max 9.4 degrees, with the rule that air cools about 6.5 degrees for every 1000 m climbed

Figure 10 — Same latitude, different height. Data: Bureau of Meteorology, retrieved 25 August 2026. Mount Buller is one of Victoria’s snow ski areas (Mt Buller resort website, retrieved 25 August 2026).

| Working                                                                                                                                                                 | Comment                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Melbourne: 8 m above sea level, mean annual maximum 20.5 °C. Mount Buller: 1707 m, mean annual maximum 9.4 °C.                                                          | Latitude is nearly the same (37.83°S and 37.15°S), so latitude cannot explain the gap.         |
| Height difference: 1707 – 8 = 1699 m, about 1700 m.<br>Temperature difference: 20.5 – 9.4 = 11.1 °C.                                                                    | Check against the rule: 1.7 × 6.5 °C ≈ 11 °C. The real numbers fit the rule almost exactly.    |
| So the air cools as it climbs, about 6.5 °C per 1000 m — the elevation rule of .E02.                                                                                    | This is why Mount Buller holds snow and is a ski area while Melbourne does not often see snow. |
| Effect on vegetation: around Melbourne’s low bayside, woodland and forest grow; high on Buller the cold grows short, tough plants and snow gums instead of tall forest. | Climbing a mountain is like travelling away from the equator — cooler climate, tougher plants. |

## Practice questions

### With help

**Q1.** Figures 1–3. Complete the pairs. The first row is done for you.

| Climate type                                       | Vegetation type     |
|----------------------------------------------------|---------------------|
| Equatorial (hot and wet all year)                  | Rainforest (forest) |
| Tropical (wet and dry seasons)                     |                     |
| Arid (very dry)                                    |                     |
| Semi-arid (dry, a little more rain)                |                     |
| Mediterranean (warm dry summers, mild wet winters) |                     |
| Temperate (mild, rain in every season)             |                     |

**Q2.** Figure 4. Name the main vegetation type you would expect: (a) near the top of Queensland, where it is hot and wet all year; (b) in the Mallee country of north-west Victoria; (c) near Perth and Adelaide.

**Q3.** Figure 5. (a) Which place gets the most rain? Which gets the least? (b) Put the five places in order from driest to wettest. (c) Finish the sentence: “In general, the more rain a place gets, the ...”

**Q4.** Figure 8. (a) Which station is the hottest? Give its latitude and its mean annual maximum temperature. (b) Which is the coolest coastal station? Give its latitude and temperature. (c) Finish the sentence: “As latitude gets bigger (further south), the mean annual maximum temperature ...”

**Q5.** Figure 6. (a) Name the months of Darwin’s wet season. (b) Which vegetation type does Darwin’s climate grow? (c) How is Melbourne’s rain pattern different from Darwin’s?

**Q6.** Figure 7. (a) Name the five things, besides climate, that change what grows in a place. (b) Pick two of them. For each, finish the sentence: “This changes what grows because ...”

### Source to read

**Source — seven real weather stations.** Bureau of Meteorology, *Climate statistics for Australian locations*, retrieved 25 August 2026.

| Station                  | Latitude | Elevation | Mean annual maximum temperature | Mean annual rainfall |
|--------------------------|----------|-----------|---------------------------------|----------------------|
| Darwin Airport           | 12.42°S  | 30 m      | 32.1 °C                         | 1736.8 mm            |
| Alice Springs Airport    | 23.80°S  | 546 m     | 28.9 °C                         | 283.8 mm             |
| Brisbane                 | 27.48°S  | 8 m       | 26.7 °C                         | 1065.2 mm            |
| Mildura Airport          | 34.24°S  | 50 m      | 24.0 °C                         | 285.1 mm             |
| Melbourne (Olympic Park) | 37.83°S  | 8 m       | 20.5 °C                         | 575.3 mm             |
| Mount Buller             | 37.15°S  | 1707 m    | 9.4 °C                          | 1491.7 mm            |
| Hobart (Ellerslie Road)  | 42.89°S  | 51 m      | 17.0 °C                         | 611.0 mm             |

**Q7.** Use the table. (a) Which two stations sit at almost the same latitude but at very different heights? (b) Use the elevation rule (about 6.5 °C per 1000 m) to explain why one of them is much cooler. (c) Which station is the driest? Which vegetation type grows there?

### On your own

**Q8.** Figures 8 and 9. In two or three sentences, explain why Darwin is so much hotter on average than Hobart.

**Q9.** Figure 10. Mount Buller is at almost the same latitude as Melbourne, yet its mean annual maximum temperature is about 11 °C cooler. Explain why, and say how this changes the vegetation.

**Q10.** A place in Australia sits near 25°S and gets very little rain all year round. Name its climate type and its vegetation type, and give one real Australian place like it.

**Q11.** Two grassy hillsides in Victoria face the same valley. One faces north, one faces south. Which hillside would you expect to be hotter and drier, with shorter grass? Explain your answer.

---

## Answers

- Q1.** Tropical → savannah; arid → desert; semi-arid → grassland; Mediterranean → woodland; temperate → forest and woodland.
- Q2.** (a) Rainforest (forest). (b) Grassland and low shrubs (Mallee woodland of small eucalypts). (c) Woodland.
- Q3.** (a) Most: Darwin Airport (1736.8 mm). Least: Alice Springs Airport (283.8 mm). (b) Alice Springs, Mildura, Melbourne, Brisbane, Darwin. (c) ...the more (and taller) the plants that can grow there.
- Q4.** (a) Darwin, 12.42°S, 32.1 °C. (b) Hobart, 42.89°S, 17.0 °C. (c) ...gets smaller (cooler).
- Q5.** (a) About November to April. (b) Savannah. (c) Melbourne gets a little rain in every month; Darwin gets almost all of its rain in the wet season and almost no rain in the dry season.
- Q6.** (a) Soils, drainage, slope, elevation, aspect. (b) Any two with a true reason, e.g. “Sandy soil changes what grows because it holds little water, so plants stay small.” “Aspect changes what grows because in Australia a north-facing slope is hotter and drier.”
- Q7.** (a) Melbourne (Olympic Park) and Mount Buller. (b) They share almost the same latitude, but Buller is about 1700 m higher; air cools about 6.5 °C per 1000 m, so Buller should be about 11 °C cooler — and it is (20.5 °C against 9.4 °C). (c) Alice Springs Airport (283.8 mm); desert.
- Q8.** Darwin is near the equator (12.42°S), where the sun is high and its heat lands on a small patch of ground; Hobart is far to the south (42.89°S), where the same heat spreads over a bigger patch. So Darwin’s average temperature is much higher (32.1 °C mean max against 17.0 °C).
- Q9.** The two places differ in elevation, not latitude: Mount Buller is 1707 m above sea level and Melbourne only 8 m. Air cools about 6.5 °C for every 1000 m climbed, about 11 °C over Buller’s height, which matches the real gap (20.5 – 9.4 = 11.1 °C). The cold high climate grows short, tough plants and snow gums instead of Melbourne’s woodland and forest.
- Q10.** Arid climate; desert vegetation; Alice Springs (23.80°S, 283.8 mm a year) is a real place like it.
- Q11.** The north-facing hillside. In Australia the sun is in the northern sky, so a north-facing slope gets more direct sun: it is hotter and drier, its soil holds less water, and its grass stays shorter than on the cooler, shadier south-facing slope.
-

## Answers with working

**Q1.** Read each climate band off Figures 1 and 2 (or the joins in Figure 3): the tropical band lines up with savannah; the arid band with desert; the semi-arid band with grassland; the Mediterranean band with woodland; the temperate band with forest and woodland.

**Q2.** (a) The top of Queensland is equatorial on Figure 4 — hot and wet all year — so rainforest (forest). (b) The Mallee country of north-west Victoria sits in the semi-arid band — grassland and low shrubs, the small eucalypts of the Mallee. (c) Perth and Adelaide sit in the Mediterranean band — woodland.

**Q3.** (a) Longest bar: Darwin Airport, 1736.8 mm; shortest bar: Alice Springs Airport, 283.8 mm. (b) Reading the bars from short to long: Alice Springs (283.8), Mildura (285.1), Melbourne (575.3), Brisbane (1065.2), Darwin (1736.8). (c) The more rain, the more and taller the plants: desert at 283.8 mm, savannah at 1736.8 mm.

**Q4.** (a) Top of the line: Darwin at 12.42°S, mean max 32.1 °C. (b) Bottom of the line: Hobart at 42.89°S, mean max 17.0 °C. (c) The line runs downhill to the right: bigger latitude, smaller (cooler) temperature.

**Q5.** (a) The tall blue bars run from November to April — the wet season. (b) Hot with a wet and a dry season is tropical climate, which grows savannah. (c) Darwin's bars are tall for half the year and near zero for the rest; Melbourne's bars are small but present in every month — rain in every season.

**Q6.** (a) The five panels of Figure 7: soils, drainage, slope, elevation, aspect. (b) Example pair with reasons: "Drainage changes what grows because water-logged ground suits reeds, not big trees." "Elevation changes what grows because high up it is colder and windier, so only short, tough plants survive."

**Q7.** (a) Melbourne (37.83°S, 8 m) and Mount Buller (37.15°S, 1707 m). (b) Same latitude, so the sun's heating is much the same; the difference is height.  $1707 - 8 \approx 1700$  m;  $1.7 \times 6.5$  °C  $\approx 11$  °C cooler; the table shows 20.5 °C against 9.4 °C, a gap of 11.1 °C — the rule works. (c) Driest is Alice Springs Airport at 283.8 mm; so little rain grows desert.

**Q8.** Step 1 — compare latitudes: Darwin 12.42°S is close to the equator; Hobart 42.89°S is about 30 degrees further south. Step 2 — apply the latitude rule (.E02): near the equator the sun's heat lands on a small patch and heats it strongly; far south, the same heat spreads over a bigger patch, so the ground is cooler. Step 3 — check with the data: 32.1 °C against 17.0 °C, 15.1 °C cooler. Step 4 — vegetation follows: savannah around Darwin, forest and woodland around Hobart.

**Q9.** Step 1 — latitude is nearly equal (37.83°S and 37.15°S), so latitude is not the cause. Step 2 — elevation differs hugely: 8 m against 1707 m. Step 3 — apply the elevation rule: air cools about 6.5 °C per 1000 m; over about 1700 m that is about 11 °C, matching the real gap of 11.1 °C. Step 4 — vegetation effect: the cold high slopes grow short, tough plants and snow gums (Buller is a ski area), while low Melbourne grows woodland and forest.

**Q10.** Step 1 — near 25°S and very dry all year matches the arid band of Figure 1. Step 2 — Figure 3 joins arid to desert vegetation. Step 3 — a real check: Alice Springs Airport at 23.80°S gets only 283.8 mm a year and sits in desert country.

**Q11.** Step 1 — aspect means the way a slope faces. Step 2 — in Australia (southern hemisphere) the midday sun is in the northern sky, so a north-facing slope gets more direct sun. Step 3 — more direct sun means hotter, drier ground that holds less water. Step 4 — so the north-facing hillside grows the shorter, drier grass, and the south-facing slope stays cooler and greener, with more water in its soil.

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**Sources (all retrieved 25 August 2026):**

- Bureau of Meteorology, *Climate statistics for Australian locations* — Darwin Airport (station 014015), Alice Springs Airport (015590), Brisbane (040913), Mildura Airport (076031), Melbourne Olympic Park (086338), Mount Buller (083024), Hobart Ellerslie Road (094029), station tables.
- Mt Buller resort website — Mount Buller is one of Victoria's snow ski areas.

All figures in this section are original teaching models drawn for this workbook; every number and place name in them is real, sourced as above.

## Same and different: Australian places and places next door

### Geography 4 · Chapter 2 · 2D

**Owens:** VC2HG4K08 (Geographical Knowledge and Understanding) **Draws on:** VC2HG4K08.E01 · VC2HG4K08.E02 · VC2HG4K08.E03 · VC2HG4K08.E04 · VC2HG4K08.E05 (every one of the five is used here)

This section is about comparing. In 2B we met the main climate types, and in 2C we saw how climate and vegetation fit together. Here we put places side by side — Australian places and places in the countries next door to us — and we ask: what is the same, and what is different? In later books this comparing grows into work on our wider region and on the differences between countries.

**Teacher note.** The teaching part reads best aloud, one figure at a time. Every number in this section is a real, rounded number with a named source and a viewed date; the sources sit in small print under the facts and inside the figures. The drawings and the map are original and simple — think of them as drawings on the board, not real maps. Answers will be different in every class; the possible answers at the end show the shape of a good response, not the only one.

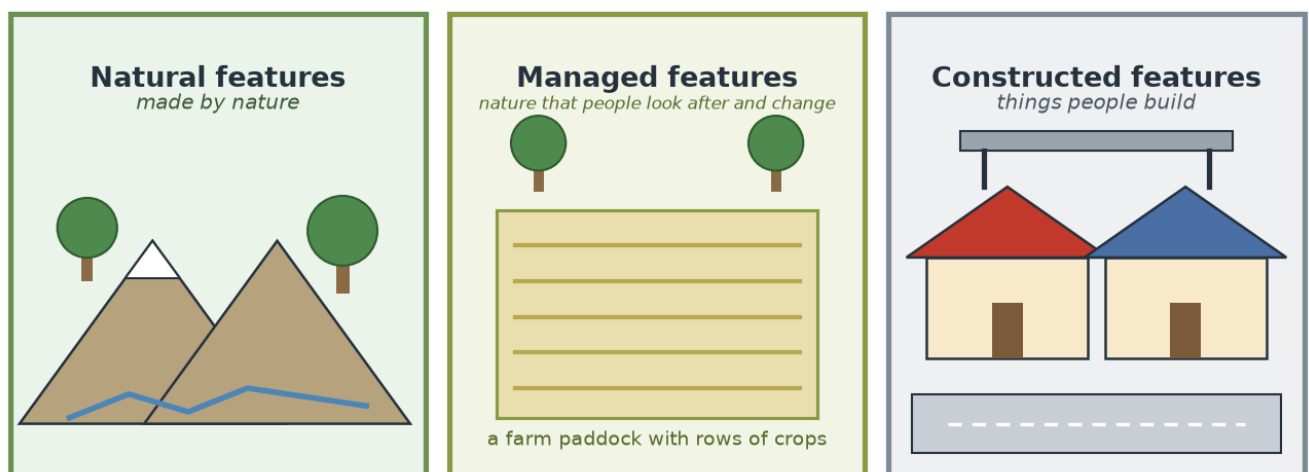
### What we are learning

**Every place is made of features.** A **feature** is anything you can point to in a place. Geographers — people who study places — sort the features of any place into three kinds.

- **Natural features** are made by nature: rocks, landforms, rivers and lakes, soil, wild plants and animals.
- **Managed features** are nature that people look after and change: a wheat farm, a pine plantation (a big farm where trees are grown), a city park with grass cut short.
- **Constructed features** are things people build: houses, schools, roads, bridges, ports. A **port** is a place on the coast where ships stop to load and unload.

### Three kinds of features

Every place is made of features. Geographers sort them into three kinds.



*Original drawing, not a real scene.*

*Three panels side by side. Natural features, drawn as mountains, a creek and trees: “made by nature”. Managed features, drawn as a farm field with rows of crops: “nature that people look after and change”. Constructed features, drawn as two houses, a road and a bridge: “things people build”.*

**Who is next door?** A **neighbouring country** is a country close to Australia — a next-door country on the map. Close neighbouring countries include Indonesia to the north-west, Papua New Guinea to the north, and the Pacific Island nations to the north-east — island countries such as Solomon Islands, Vanuatu and Fiji. In this section we compare Australian places with places in Indonesia and in Fiji.

## Australia and its neighbours

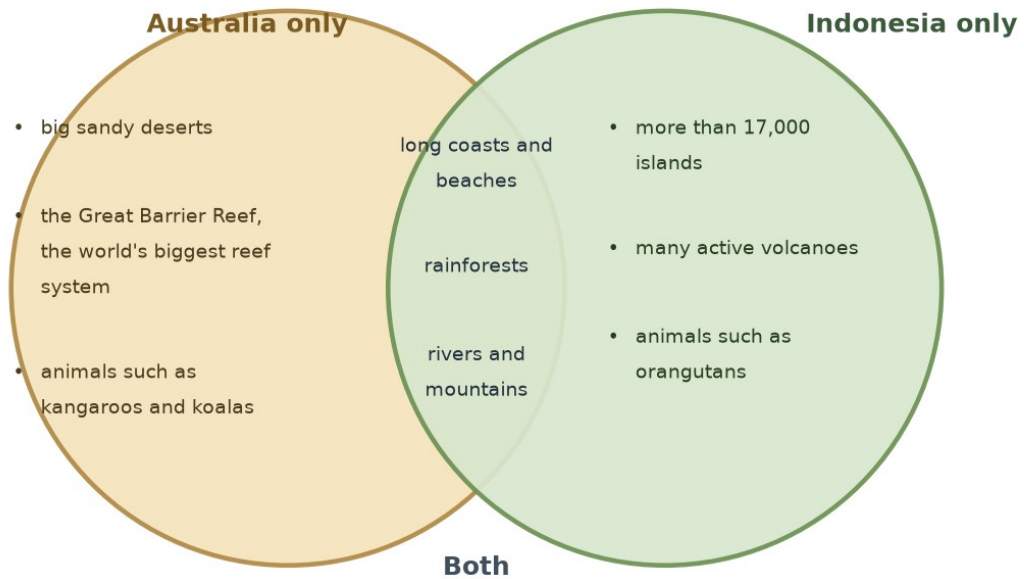


*Original map with simplified shapes. Not to scale — not for navigation.*

*A simple original map, not a real map. Australia sits in the middle. Indonesia lies to the north-west, with its islands of Sumatra, Java, Borneo and Sulawesi. The big island of New Guinea is shared by Indonesia and Papua New Guinea. The Pacific Island nations of Solomon Islands, Vanuatu and Fiji lie to the north-east, and New Zealand far to the south-east. The Indian Ocean and the Pacific Ocean are named. Dots mark Darwin, Jakarta, Suva, Melbourne and Alice Springs.*

**Same and different: natural features.** Natural features are a good place to start comparing, because nature does not stop where one country ends and the next begins. Look at Australia and Indonesia side by side.

## Same and different: natural features of Australia and Indonesia



*A model chart for Question 10. Sorted from the facts in this section.*

*A same-and-different chart of two overlapping circles. Australia only: big sandy deserts; the Great Barrier Reef, the world's biggest coral reef; animals such as kangaroos and koalas. Both: long coasts and beaches, rainforests, rivers and mountains. Indonesia only: more than 17,000 islands, many active volcanoes, animals such as orangutans.*

Some facts behind the chart. The Great Barrier Reef, off the north-east coast of Australia, is the biggest coral reef in the world. A **reef** is rock in the sea built up by tiny living animals, and **coral** is the name of those animals (Source: Great Barrier Reef Marine Park Authority, viewed 25 August 2026). Indonesia is made of more than 17,000 islands (Source: Geospatial Information Agency of Indonesia, viewed 25 August 2026). Many of its volcanoes are still active — a **volcano** is a mountain that can burst open with hot rock and ash — and Mount Merapi, on the island of Java, is one of its most active volcanoes (Source: Smithsonian Institution Global Volcanism Program, viewed 25 August 2026). Orangutans live only on two islands, Sumatra and Borneo (Source: World Wildlife Fund, viewed 25 August 2026). Both countries share features too: long coasts, rainforests in the wet north — a **rainforest** is a forest with heavy rain — rivers, mountains and some hot, dry deserts (a **desert** is a place with very little rain).

**Climates near and far.** In 2B we learned the names of the main climate types. Here they are at work in five real places.

## Five places, five climates

The climate of a place is its weather pattern over many years. Here are the main types.

| Place         | Country   | Climate type | What it is like                                 |
|---------------|-----------|--------------|-------------------------------------------------|
| Jakarta       | Indonesia | equatorial   | hot all year; rain in most months               |
| Suva          | Fiji      | tropical     | warm all year; a wet season and a dry season    |
| Darwin        | Australia | tropical     | hot all year; a wet season and a dry season     |
| Alice Springs | Australia | arid         | hot days; very little rain                      |
| Melbourne     | Australia | temperate    | warm summers, cool winters; rain in every month |

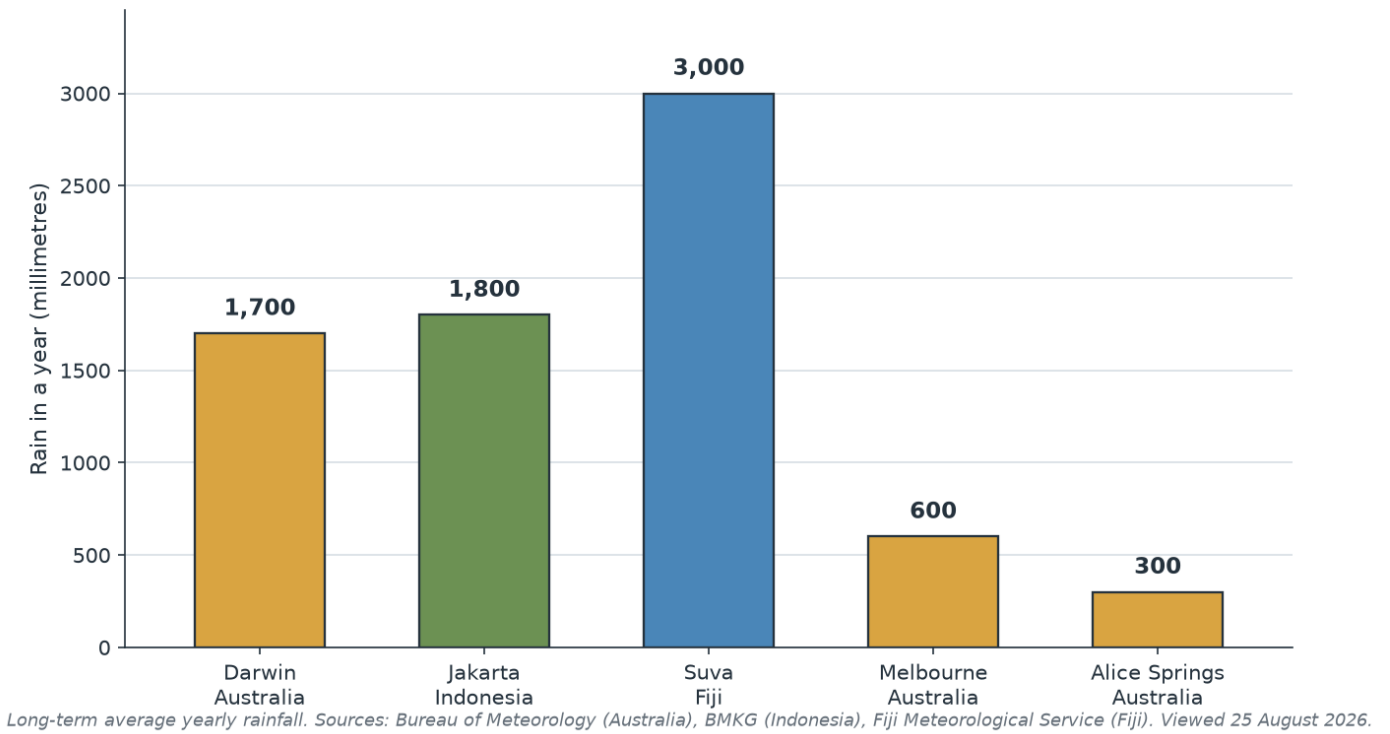
*Climate names are the ones used in section 2B of this book. The pattern for each place is its long-term average.*

*A table of five places and their climate types. Jakarta, Indonesia: equatorial — hot all year, rain in most months. Suva, Fiji: tropical — warm all year, a wet season and a dry season. Darwin, Australia: tropical — hot all year, a wet season and a dry season. Alice Springs, Australia: arid — hot days, very little rain. Melbourne, Australia: temperate — warm summers, cool winters, rain in every month.*

Two of the five places sit in neighbouring countries. Jakarta's equatorial climate is not found in Australia at all; the closest match is Darwin's tropical climate up north. Fiji has no arid places at all — Suva is tropical and wet. So the climate types are sometimes the same (tropical Darwin and tropical Suva) and sometimes different (equatorial Jakarta has no Australian twin).

**A source to read.** Geographers check their comparing against real numbers. Here is one source, drawn as a column chart: how much rain falls in a year at five places. The numbers are long-term **averages** — the usual amounts, counted over many years.

## How much rain falls in a year?



A column chart titled “How much rain falls in a year?” with five columns: Darwin about 1,700 millimetres, Jakarta about 1,800 millimetres, Suva about 3,000 millimetres, Melbourne about 600 millimetres, Alice Springs about 300 millimetres.

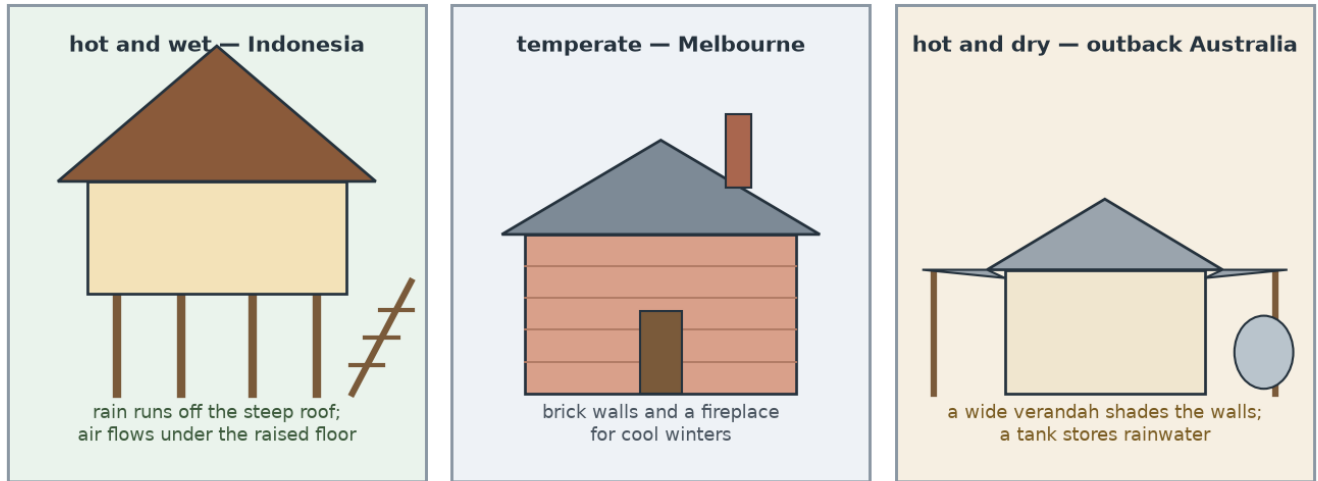
(Long-term average rain in a year. Sources: Bureau of Meteorology (Australia); BMKG (Indonesia); Fiji Meteorological Service (Fiji). Viewed 25 August 2026.)

Rain is counted in **millimetres** (mm): 10 mm of rain would fill a dish with straight sides 10 mm deep. Read the source like a geographer: Suva’s year holds about ten times as much rain as the year at Alice Springs. Question 6 below asks you to use this source.

**Homes for their climate.** People build homes that fit the weather where they live. Here are three real kinds of homes.

## Homes built for their climate

People build homes that fit the weather where they live. Three real kinds of homes:



*Original drawings, not photos of real houses.*

*Three home drawings. A hot-and-wet home as in Indonesia: raised on poles, with a steep roof so rain runs off and air flows under the floor. A temperate home as in Melbourne: brick walls and a fireplace for cool winters. A hot-and-dry home as in outback Australia: a wide verandah shades the walls, and a tank stores rainwater.*

In hot, wet places like Jakarta, homes are often raised on poles, and the steep roof carries heavy rain away quickly; the air moving under the floor keeps the house cool. In temperate places like Melbourne, winters are cool, so brick walls hold the heat in and a fireplace warms the house. In hot, dry places like the Australian outback, a wide **verandah** — a roofed outdoor room along the outside of the house — shades the walls, and a tank catches and stores rainwater, because rain is rare.

**A ladder of settlements.** A **settlement** is a place where people live. Settlements come in different sizes, and we can put them in size order — geographers call this a **settlement ladder** — from one lonely home to a huge city. The steps are: an **isolated dwelling** (one home, far from any town), an **outstation** (a few homes in a very far-away place), a **village**, a **town**, a **regional centre** and a **large city**.

## A ladder of settlements — from smallest to biggest

A settlement is a place where people live. Here are the rungs of the ladder, with a real example from Australia for each.



Original drawing. People numbers: Australian Bureau of Statistics, 2021 Census. Viewed 25 August 2026.

*A ladder of six steps from smallest to biggest, each step named with a real Australian example: isolated dwelling — one home, far from any town; outstation — a few homes in a very remote place; village — a small settlement where people live close together; town — Mildura, Victoria, about 34,000 people; regional centre — Geelong, Victoria, about 270,000 people; large city — Melbourne, about 4.9 million people. An arrow up the left side reads “gets bigger”.*

Birdsville, out in the far west of Queensland, is a village of about 100 people — a good living example of the village step. The people numbers in this section come from a **census** — a careful count of every person in a country.

*(People numbers: Australian Bureau of Statistics, 2021 Census (Birdsville, Geelong, Melbourne); Statistics Indonesia, 2020 Census (Jakarta); Fiji Bureau of Statistics, 2017 Census (Suva). Viewed 25 August 2026.)*

**Three big places, side by side.** A **capital** is the city a country is run from. Jakarta is Indonesia’s capital; Suva is Fiji’s capital.

## Three big places, side by side

|                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Melbourne</b><br><i>Australia</i><br><b>about 4.9 million people</b><br><b>a large city</b> <ul style="list-style-type: none"><li>• tall buildings, roads and trains</li><li>• a big bay and a river</li><li>• flats and houses with gardens</li></ul> | <b>Jakarta</b><br><i>Indonesia</i><br><b>about 10.6 million people</b><br><b>a large city — the capital</b> <ul style="list-style-type: none"><li>• sits on a bay, with a big port</li><li>• tall buildings and busy roads</li><li>• the sea is close to the middle of the city</li></ul> | <b>Suva</b><br><i>Fiji</i><br><b>about 90,000 people</b><br><b>a city — the capital</b> <ul style="list-style-type: none"><li>• a small city with a harbour</li><li>• hills and rain behind the town</li><li>• warm sea and coral reefs nearby</li></ul> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

People numbers: Australian Bureau of Statistics, 2021 Census (Melbourne); Statistics Indonesia, 2020 Census (Jakarta); Fiji Bureau of Statistics, 2017 Census (Suva). Viewed 25 August 2026.

*Three place cards. Melbourne, Australia, about 4.9 million people, a large city: tall buildings, roads and trains; a big bay and a river; flats and houses with gardens. Jakarta, Indonesia, about 10.6 million people, a large city and the capital: sits on a bay with a big port; tall buildings and busy roads; the sea close to the middle of the city. Suva, Fiji, about 90,000 people, a city and the capital: a small city with a harbour; hills and rain behind the town; warm sea and coral reefs nearby.*

A **harbour** is a calm water place where ships keep safe. Look across the three cards: Melbourne and Jakarta are both large cities on a bay — a similarity. Jakarta has about 10.6 million people and Melbourne about 4.9 million — a difference. Suva is a capital too, but it is small: about 90,000 people. Not every capital is a large city.

### Worked examples

#### **Example 1 — Sorting the features of Melbourne and Jakarta**

(VC2HG4K08.E05 · VC2HG4K08.E02)

We choose Jakarta, in Indonesia, to compare with Melbourne — exactly the choice VC2HG4K08.E05 asks for. Then we sort real features of each place into the three kinds.

## Sorting the features of two real places

Worked example 1 uses this chart. One feature from each place has been sorted for you; the pattern shows how.

| Place     | Feature                                | Kind        | Why                                      |
|-----------|----------------------------------------|-------------|------------------------------------------|
| Melbourne | the Yarra River                        | natural     | made by nature                           |
| Melbourne | city parks with mown lawns and gardens | managed     | nature that people look after            |
| Melbourne | the West Gate Bridge and the roads     | constructed | built by people                          |
| Jakarta   | the bay and the rivers                 | natural     | made by nature                           |
| Jakarta   | parks and farms on the city's edge     | managed     | nature that people look after and change |
| Jakarta   | tall buildings, roads and the port     | constructed | built by people                          |

Both places have all three kinds of features. That is a similarity. The features themselves are different. That is a difference.

A sorting chart with six rows. Melbourne: the Yarra River — natural; city parks with cut grass and gardens — managed; the West Gate Bridge and the roads — constructed. Jakarta: the bay and the rivers — natural; parks and farms on the city's edge — managed; tall buildings, roads and the port — constructed.

### What we do

We name real features we can see in each place: a river, a park, a bridge, a port.

We sort each feature into natural, managed or constructed. The Yarra River is natural; a Melbourne park is managed; the West Gate Bridge is constructed.

We look down the chart: both places have all three kinds of features.

We look across the chart: Melbourne's river is the Yarra; Jakarta has a big sea port and Melbourne a smaller one.

### Why it works

Naming real features first keeps the comparing honest. (VC2HG4K08.E02)

The three kinds give both places one shared sorting — that is what lets us compare them side by side.

“Both have all three kinds” is a similarity — a same.

The features themselves are different — a difference. (VC2HG4K08.E05)

Why the differences? The reasons go back to nature and to people. Jakarta sits low on an equatorial coast with heavy rain and about 10.6 million people; Melbourne sits on a bay and a river in a temperate place with about 4.9 million people. Different coasts, different climates, different numbers of people — different features.

### Example 2 — From climate to home: four real places

(VC2HG4K08.E01 · VC2HG4K08.E03)

This time we start from the climate and work out what a home needs.

### What we do

We read the climate type first: Jakarta — equatorial; Darwin — tropical; Birdsville — arid.

We say what that climate means for a house: hot and wet

### Why it works

The climate is the weather pattern a house must fit. (VC2HG4K08.E01)

A home is built to suit its weather.

— steep roof, raised floor; hot and dry — shade and stored water; temperate — warm walls for winter.

We match the homes: the raised, steep-roofed home fits Jakarta, and would suit Darwin too; the wide-verandah home with its water tank fits Birdsville; the brick home with a fireplace fits Melbourne.

We check a difference: the Melbourne home has a fireplace, but a Jakarta home never needs one.

Similar climates lead to similar homes, even in different countries — a similarity with a reason.  
(VC2HG4K08.E03)

Different climates lead to different homes — a difference with a reason.

So when two places share a climate type — like tropical Darwin and tropical Suva — their homes often look similar for good reasons. When the climates differ, the homes differ too.

## Practice tasks

### With help

**Q1.** Sort the cards. Look at the ten feature cards in the picture. Sort them into three piles: natural, managed and constructed. For each card, say your reason in one spoken sentence.

### Feature cards to sort

Each card names a real feature. Sort them into natural, managed or constructed.



*Every feature on these cards is real and named.*

*Ten feature cards to sort: the Great Barrier Reef; a wheat farm; the West Gate Bridge; the Yarra River; a pine plantation; a school building; the Twelve Apostles rock stacks; a city park; the Great Ocean Road; the Mount Merapi volcano.*

**Q2.** Climates on the map (VC2HG4K08.E01). Use the climate table and the map of the countries next to Australia.

- Find the five places from the table on the map. Which sits most to the north? Which sits most to the south?
- Name the climate type of the place most to the north, and of the place most to the south.
- Which two places on the map share the same climate type?
- Which climate type in the table does Australia have and Fiji not?

**Q3.** A same-and-different chart of your own (VC2HG4K08 . E02). Copy the table below and fill it in for the natural features of Australia and Indonesia. Start from the chart in this section, then add one same and one different of your own.

Australia only

Both

Indonesia only

---

**Q4.** Match the home to the place (VC2HG4K08 . E03). Match each home below to the place it fits best: Jakarta, Melbourne or Birdsville. Then say why in one sentence that names the climate.

1. A home raised on poles, with a steep roof.
2. A brick home with a fireplace.
3. A home with a wide verandah and a rainwater tank.

**Q5.** Put the examples on the ladder (VC2HG4K08 . E04). Here are five real examples. Put each one on its step of the settlement ladder.

- - a. A cattle station home, hundreds of kilometres from the nearest town
- - b. Birdsville — about 100 people
- - c. Mildura — about 34,000 people
- - d. Geelong — about 270,000 people
- - e. Melbourne — about 4.9 million people

Which step of the ladder still has no example? Make up one example that could be real for it.

**Q6.** Read the rain source (VC2HG4K08 . E01). Use the column chart of rain in a year in this section.

1. Which of the five places is the wettest? Which is the driest?
2. Which two places in the chart sit in neighbouring countries?
3. Suva's rain in a year is about how many times Melbourne's?
4. Do Jakarta and Suva each get more or less rain than Darwin?
5. Jakarta is equatorial and Suva is tropical. Which one gets rain in more months of the year? How does the climate table tell you?

### **On your own**

**Q7.** Choose your own place in a neighbouring country (VC2HG4K08 . E05). Choose one — Suva, or another place in Indonesia or a Pacific Island nation that you can find in a classroom book or map. Compare it with a place in Australia you know. Write one similarity and one difference about managed or constructed features, and give one reason for each.

**Q8.** Why are the homes different? (VC2HG4K08 . E03) In two or three sentences, explain why a home in Melbourne is not built the same way as a home in Jakarta. Use at least two climate words from this section.

**Q9.** Your own settlement examples (VC2HG4K08 . E04). Name a real settlement for any three steps of the ladder that Q5 did not use. If you know people numbers, write them; if not, write “bigger than a village” or “smaller than a town” and the like.

**Q10.** A whole chart of your own (VC2HG4K08 .E02). The section's same-and-different chart compared Australia with Indonesia. Make your own chart comparing the natural features of Australia with a Pacific Island nation of your choice. Put at least three items in each part of the chart, and mark which items you could check in a book or on a map.

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## Possible answers

*Answers will be different in every class. These show the shape of a good response.*

**Q1.** Natural: the Great Barrier Reef, the Yarra River, the Twelve Apostles rock stacks, the Mount Merapi volcano. Managed: a wheat farm, a pine plantation, a city park. Constructed: the West Gate Bridge, a school building, the Great Ocean Road. A good reason names who made it: nature, people looking after nature, or people building.

**Q2.** (1) Most to the north: Jakarta; most to the south: Melbourne. (2) Jakarta — equatorial; Melbourne — temperate. (3) Darwin and Suva — both tropical. (4) Arid and temperate — Suva's Fiji is tropical only.

**Q3.** Check: the Australia-only and Indonesia-only items come from the section's chart or a checked fact; the "both" items are truly shared; the extra same and extra different are the child's own.

**Q4.** 1 — Jakarta (hot and wet: the steep roof sheds rain, the raised floor lets air cool the house). 2 — Melbourne (temperate: cool winters need warm walls). 3 — Birdsville (arid: shade from the verandah, stored rainwater because rain is rare).

**Q5.** a — isolated dwelling; b — village; c — town; d — regional centre; e — large city. Steps still empty: outstation. A good made-up outstation is "three families living together at a far camp, hundreds of kilometres from town".

**Q6.** (1) Wettest: Suva (about 3,000 mm); driest: Alice Springs (about 300 mm). (2) Jakarta and Suva. (3) About five times (3,000 against 600). (4) More — Jakarta (about 1,800 mm) and Suva (about 3,000 mm) are both wetter than Darwin (about 1,700 mm). (5) Jakarta — equatorial means rain in most months; Suva's tropical climate has a wet season and a dry season.

**Q7.** A good response names both places, gives one same and one different about managed or constructed features (for example: "Suva and Cairns both have ports; Jakarta has trains like Melbourne but many more people"), and a reason that goes back to climate, coast or people numbers.

**Q8.** A good response uses climate words (equatorial, tropical, temperate, arid; wet season, dry season; hot, cool) to say that Melbourne's cool winters need walls that hold heat in, while Jakarta's hot, wet climate needs homes that shed rain and stay cool.

**Q9.** Check that each named settlement sits on a step it truly fits — for example Alice Springs (a town), Cairns (a regional centre), a farm house far from town (an isolated dwelling).

**Q10.** Check: at least three items in each part; the items are natural features (rocks, landforms, rivers and lakes, climate, soil, wild plants and animals); the child has marked which items are checkable.

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*Next in Chapter 2: 2E asks how people look after the things places give us — water, soil, trees — and the waste we make.*

## Sustainability: using natural resources and managing waste

*This section answers the big question of Chapter 2: **How can people use resources or manage waste sustainably?** It owns content description code VC2HG4K09 of the Victorian Curriculum 2.0 (Geography, Levels 3–4). The curriculum adds example activities called **elaborations**; this section draws on .E01–.E05 (codes only — each idea is taught below in this book’s own words).*

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### Theory — a short teaching sequence

#### 1. What does “sustainability” mean?

People use the word *sustainability* in more than one way, so we say what we mean by it here. In this section, *sustainability* is used in the sense of the Victorian Curriculum and of the 1987 United Nations report *Our Common Future*, written by a group called the World Commission on Environment and Development: looking after things so that people today have what they need, and people born later can have what they need too. Other definitions exist and are not exactly the same as this one. Our working definition is:

**Sustainability** (as used here): using things today in a way that leaves enough of them, and a healthy environment, for people in the future.

Sustainability is about the **environment** — the air, water, soil, plants and animals around us — and about two jobs the environment does for us every day.

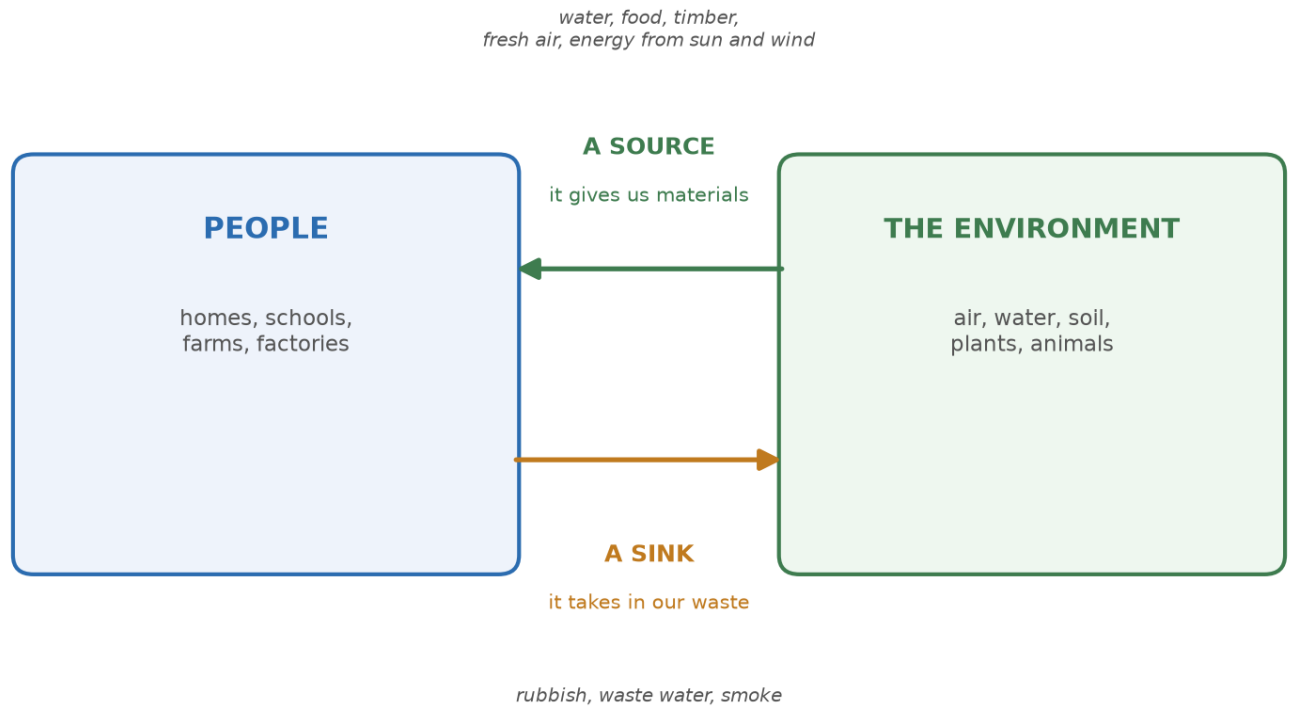
#### 2. The environment is our source and our sink (draws on .E01)

The environment does two jobs for every person on Earth:

- **A source.** It gives us the materials we live on: water to drink, food to eat, timber for houses and paper, fresh air to breathe, and energy from the sun and the wind.
- **A sink.** It takes in what we throw out: our rubbish, our waste water and the smoke from fires and factories. The air, soil and water soak up our waste.

*Sustainability means keeping both jobs working into the future.* If we take from the environment faster than nature can renew it, or pour waste in faster than nature can break it down and clean it, both jobs start to fail.

## The environment gives us what we need — and takes in what we throw out



Two boxes joined by arrows. The environment box gives materials — water, food, timber, fresh air, energy from the sun and wind — to the people box, so it is a source; the people box puts rubbish, waste water and smoke back into the environment box, so it is a sink.

### 3. Renewable and non-renewable resources (draws on .E02)

A **resource** is anything in nature that people use. There are two kinds:

- A **renewable resource** can be renewed (made again) by nature or by people within a human lifetime: sunlight, wind, water, timber, food crops.
- A **non-renewable resource** cannot. There is a fixed amount of it on Earth, and once we use it up it is gone: coal, oil, natural gas, and minerals taken from rock.

## Two kinds of natural resources

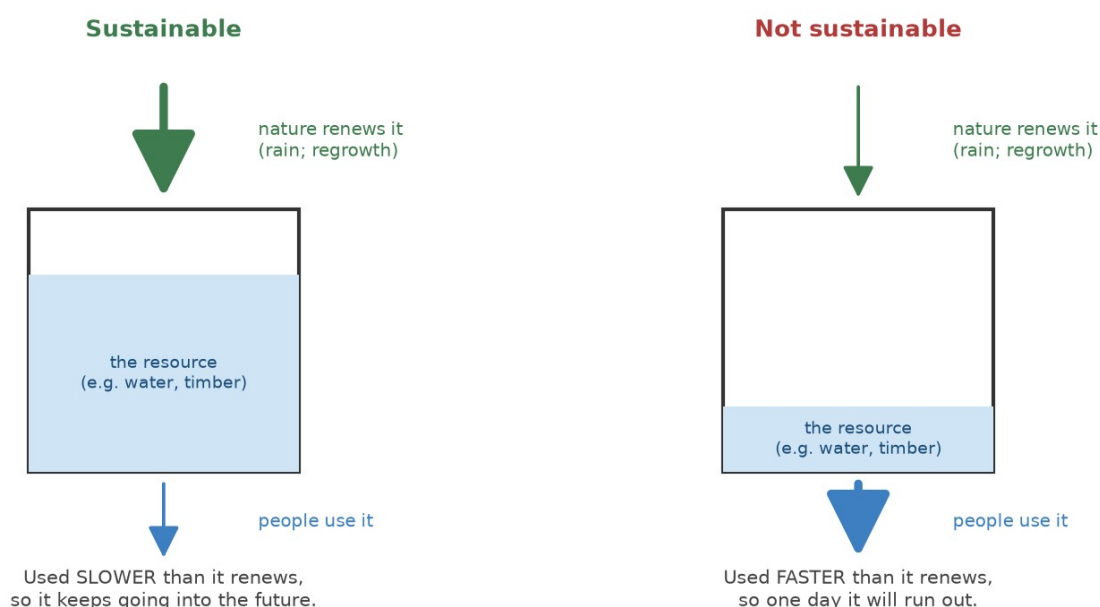
| RENEWABLE RESOURCES                                                                                                        | NON-RENEWABLE RESOURCES                                               |
|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| <b>Sunlight</b> shines every day                                                                                           | <b>Coal</b> formed over millions of years                             |
| <b>Wind</b> always moving                                                                                                  | <b>Oil</b> formed over millions of years                              |
| <b>Water</b> renewed by rain                                                                                               | <b>Natural gas</b> formed over millions of years                      |
| <b>Timber</b> trees are replanted and regrow                                                                               | <b>Minerals (e.g. gold, iron)</b> formed from rock; cannot regrow     |
| <b>Food crops</b> grown again each season<br><i>Nature can renew these — if we do not use them faster than they renew.</i> | <i>There is a fixed amount on Earth. Once used up, they are gone.</i> |

A two-column table. Renewable resources — sunlight, wind, water, timber and food crops — can be renewed. Non-renewable resources — coal, oil, natural gas and minerals — are a fixed amount and cannot regrow.

A renewable resource is only sustainable if we obey one rule:

**Use it no faster than it renews.**

### The rule for renewable resources



A model of two tanks. Left: nature renews the resource faster than people use it, so the tank stays full — sustainable. Right: people use the resource faster than nature renews it, so the tank runs low — not sustainable.

**A real example — timber in Victoria.** Timber is renewable because trees regrow. From 1 January 2024, Victoria stopped logging (cutting trees for timber) in its native forests, and nearly all timber now comes from **plantations** — farms of trees where every tree cut down is replaced by new trees planted in its place. Cutting and replanting at that pace keeps the resource renewing. (*End of native forest logging: announced 23 May 2023, starting 1 January 2024 — Wikipedia, “VicForests”, retrieved 25 August 2026.*)

#### 4. Waste: biodegradable and non-biodegradable (draws on .E03)

When the environment works as a sink, tiny living things in the soil and water break some waste down into soil again. Waste is sorted into two kinds:

- **Biodegradable** waste can be broken down by nature: food scraps, paper, cardboard, grass clippings.
- **Non-biodegradable** waste cannot: most plastics, glass, and metal cans and tins. These stay in the environment for a very long time.

The sustainability of waste depends on the same kind of rule as for resources: biodegradable waste must not be added faster than nature can break it down, and non-biodegradable waste must not be added in amounts that harm people, animals or plants.

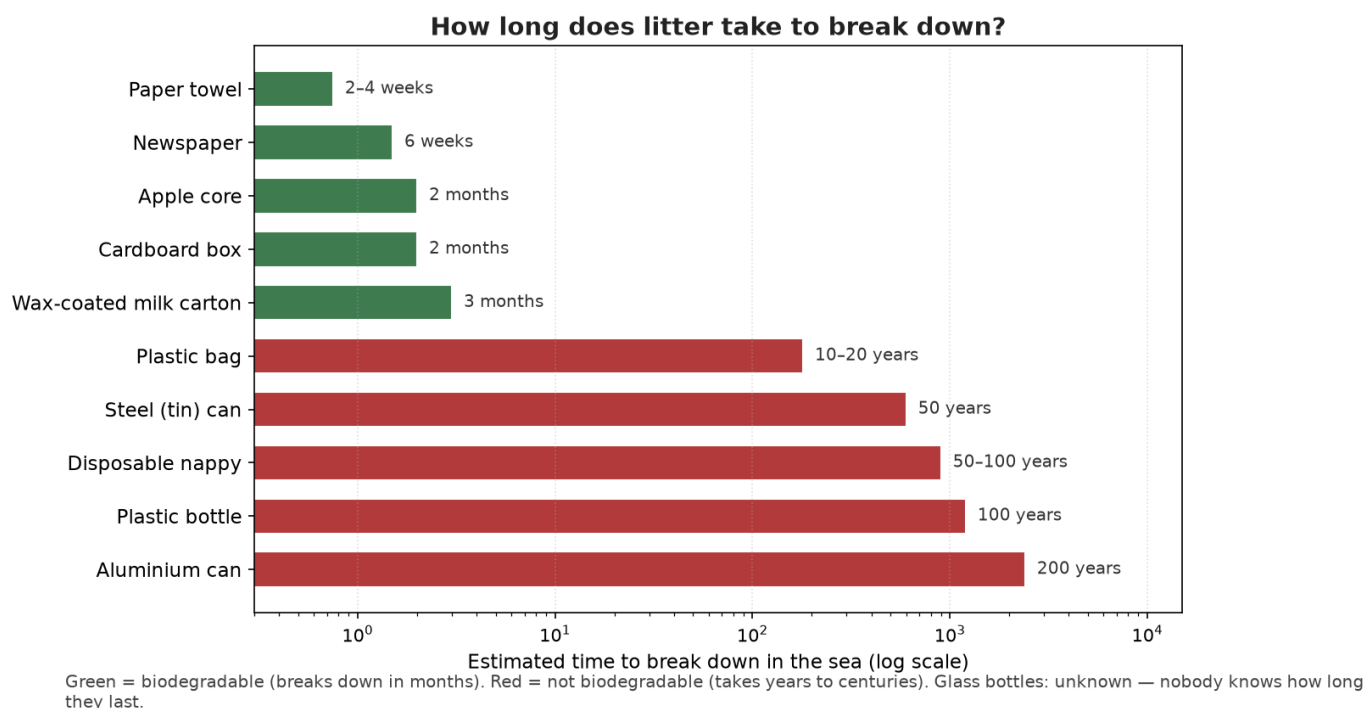
#### Sorting waste: can nature break it down?

| BIODEGRADABLE<br>nature can break it down | NON-BIODEGRADABLE<br>nature cannot break it down |
|-------------------------------------------|--------------------------------------------------|
| ✓ banana skin                             | ● plastic bottle                                 |
| ✓ apple core                              | ● plastic bag                                    |
| ✓ food scraps                             | ● aluminium drink can                            |
| ✓ grass clippings                         | ● steel food tin                                 |
| ✓ paper                                   | ● glass jar                                      |
| ✓ cardboard                               | ● foam cup                                       |

*Biodegradable waste breaks down quickly if nature has time. Non-biodegradable waste stays in the environment for a very long time.*

*A sorting chart. Biodegradable waste — banana skin, apple core, food scraps, grass clippings, paper, cardboard — breaks down in nature. Non-biodegradable waste — plastic bottle, plastic bag, aluminium drink can, steel food tin, glass jar, foam cup — does not.*

How long does litter actually last? Scientists' estimates are shown below.



Source: 'Marine Debris Biodegradation Time Line', C-MORE (after Mote Marine Laboratory, 1993), reproduced in Wikipedia, 'Biodegradation'. Retrieved 25 August 2026. Estimates only.

A bar chart of estimated breakdown times of litter in the sea: paper towel 2–4 weeks, newspaper 6 weeks, apple core 2 months, cardboard box 2 months, wax-coated milk carton 3 months, plastic bag 10–20 years, steel (tin) can 50 years, disposable nappy 50–100 years, plastic bottle 100 years, aluminium can 200 years; glass bottles: unknown.

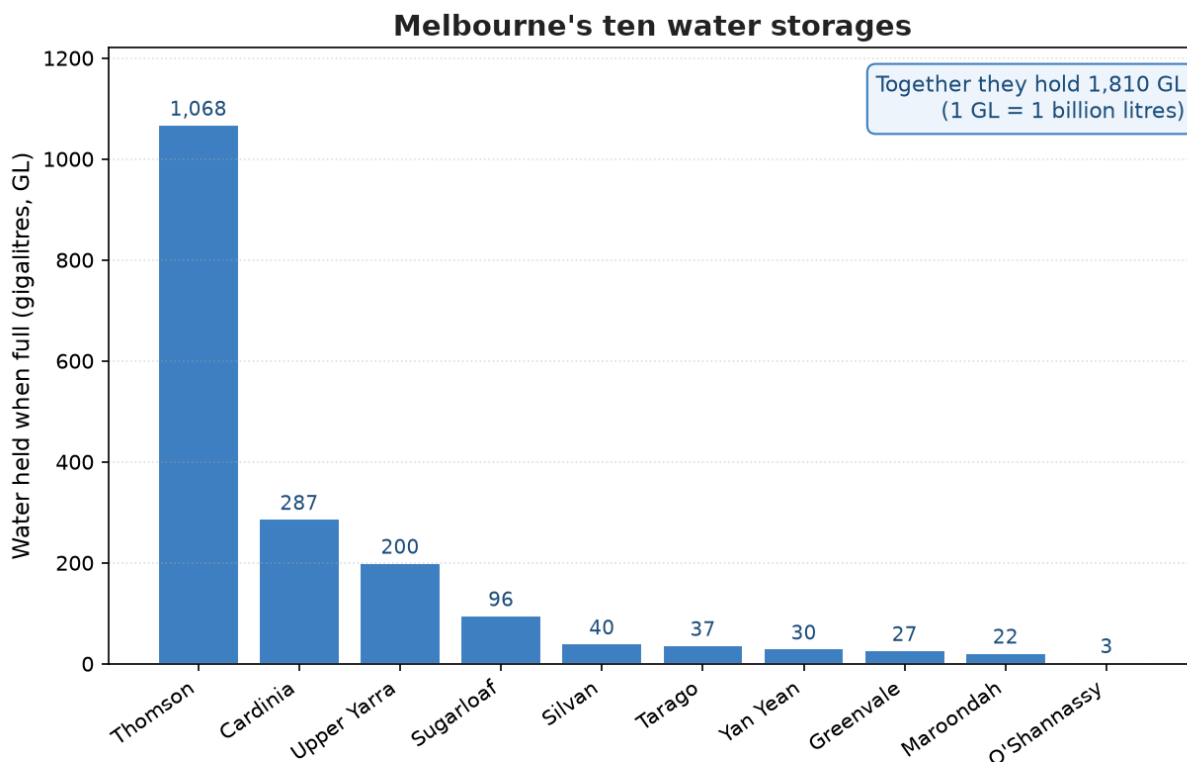
(Chart data: “Marine Debris Biodegradation Time Line”, C-MORE, after Mote Marine Laboratory, 1993, as printed in Wikipedia, “Biodegradation”, retrieved 25 August 2026. Estimates only.)

Non-biodegradable litter is the problem part of the sink. In Victoria, about **14,560 tonnes of litter** is dropped into the environment each year, and about 75% of it is cigarette butts and packaging. (*Keep Australia Beautiful, 2018, and EPA Victoria, 2019, as printed in Wikipedia, “Waste management in Australia”, retrieved 25 August 2026.*) Plastic in the environment can be eaten by animals, or can smother plants and soil — harm to animal and plant life is exactly what the sustainability rule warns about.

**Two fair points of view.** Packaging is light, cheap and keeps food clean and safe — those are real good reasons people use it. On the other side, plastic that is thrown away or dropped stays in the environment for hundreds of years and can harm animals — a real harm. Sustainability asks us to weigh both sides honestly, then use less, reuse more, and put waste in the right bin.

## 5. Tracing one renewable resource: water (draws on .E04)

Where does a renewable resource come from, and how can we use it sustainably? Trace **water** in Melbourne. Melbourne’s water is stored in ten big reservoirs (dams) in the hills and ranges around the city. The land above each dam is its **catchment** — the land where rain lands and runs downhill into the dam — and that rain renews the water.



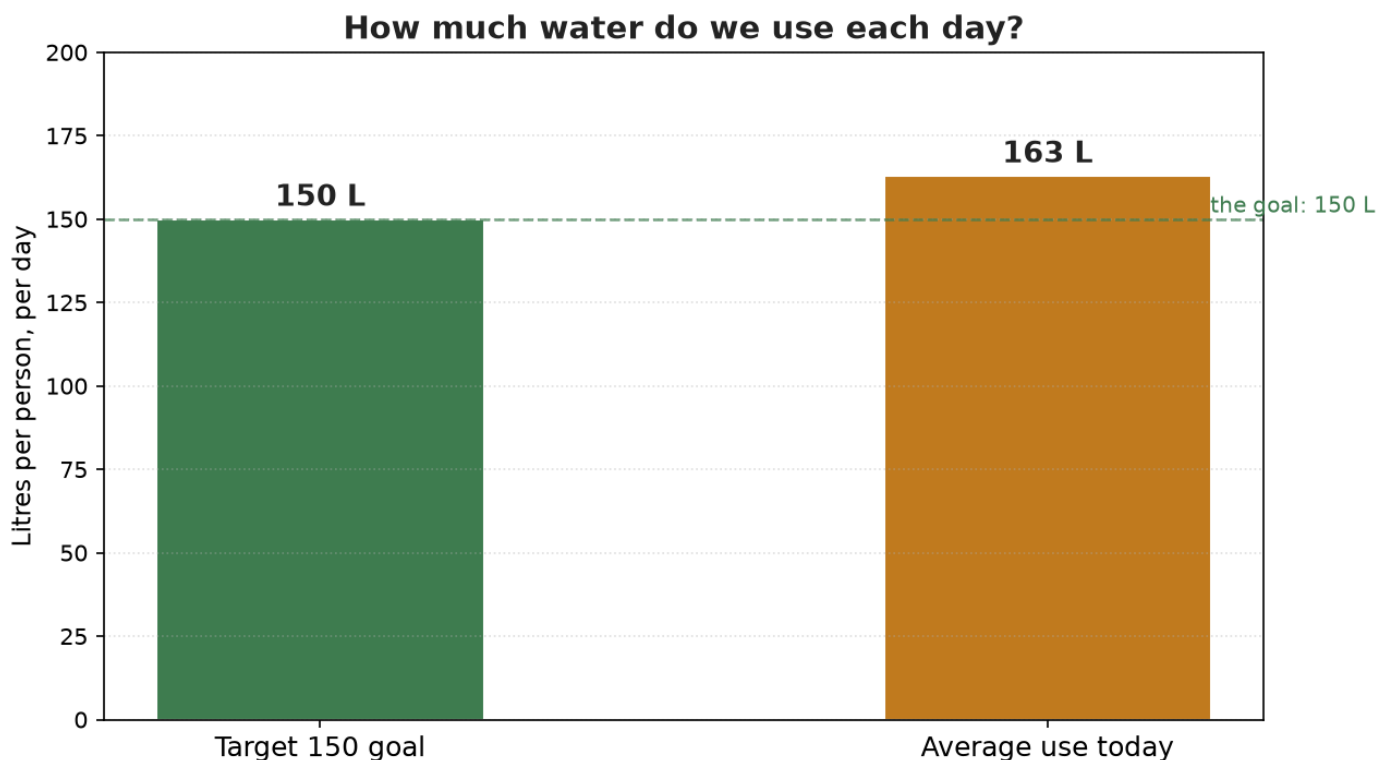
Source: Melbourne Water, 'Water storage reservoirs', [melbournewater.com.au](http://melbournewater.com.au). Retrieved 25 August 2026. Total is the sum of the ten capacities shown.

A bar chart of Melbourne's ten water storages and how much each holds when full: Thomson 1,068 gigalitres; Cardinia 287; Upper Yarra 200; Sugarloaf 96; Silvan 40; Tarago 37; Yan Yean 30; Greenvale 27; Maroondah 22; O'Shannassy 3. Together they hold 1,810 gigalitres; 1 GL = 1 billion litres.

(How much each storage holds: Melbourne Water, "Water storage reservoirs", [melbournewater.com.au](http://melbournewater.com.au), retrieved 25 August 2026.) Melbourne Water supplies about **1,250 million litres** of water a day to more than **5 million people** (Melbourne Water, "Our water supply system", same date). Number words used here: a **million** is 1,000,000, and a **billion** is 1,000 millions. One **gigalitre** (GL) is 1,000 million litres — 1 billion litres.

Two ways to make water use more sustainable, exactly as the curriculum names them:

**Way 1 — reduce consumption (use less).** In the area served by South East Water, most people use about **163 litres** each per day. South East Water's Target 150 asks people to keep below **150 litres** each per day. Every shorter shower and every garden watered in the cool of the evening moves a household towards the target.



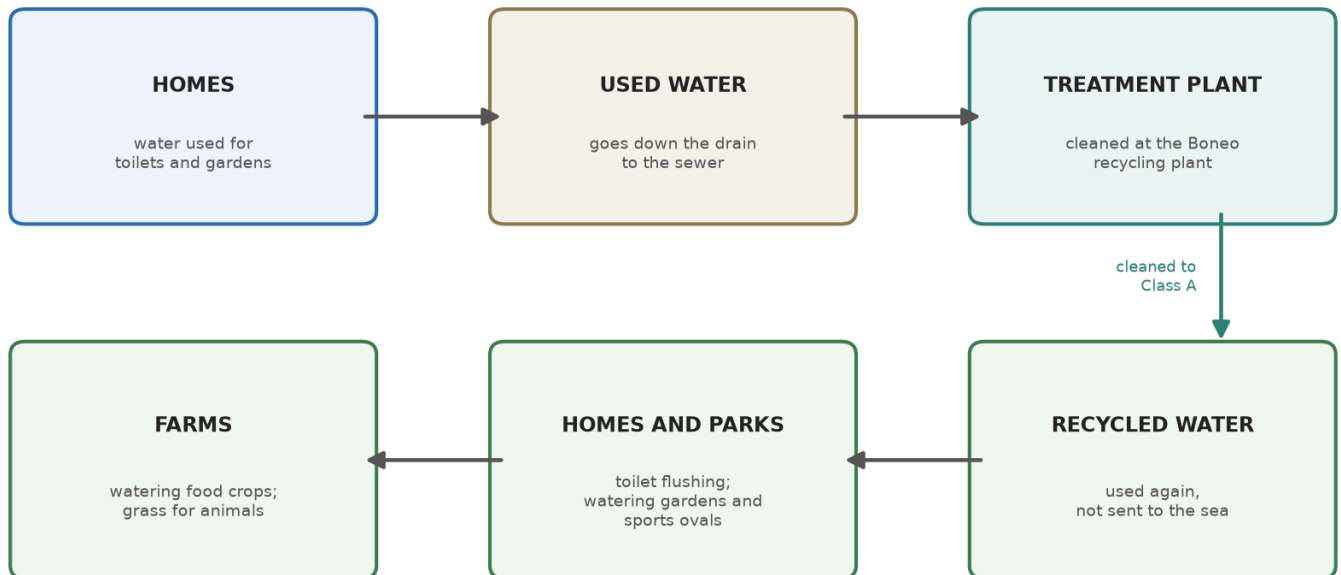
In the area served by South East Water, most people use about 163 litres a day — 13 litres more than the 150-litre goal.  
 Source: South East Water, 'Target 150', southeastwater.com.au. Retrieved 25 August 2026.

*A bar chart comparing South East Water's Target 150 goal of 150 litres per person per day with the average use of about 163 litres per person per day in its area.*

*(South East Water, "Target 150", southeastwater.com.au, retrieved 25 August 2026.)*

**Way 2 — recycle waste water.** Used water from homes is not just thrown away. It is cleaned at treatment plants and used again as **recycled water**. On the Mornington Peninsula in Victoria, South East Water's plants at Boneo, Mount Martha and Pakenham clean used water to **Class A**, the highest grade — clean enough to be used in homes for toilet flushing and garden watering — and Class C recycled water grows food crops and waters sports ovals.

### Recycled water on the Mornington Peninsula, Victoria



South East Water treats used water at Boneo, Mount Martha and Pakenham. Class A is the highest grade — clean enough for homes.  
Source: South East Water, 'Recycled water', southeastwater.com.au. Retrieved 25 August 2026.

*A flow diagram of recycled water on the Mornington Peninsula: homes use water for toilets and gardens; used water goes down the drain to the sewer; it is cleaned at the Boneo recycling plant to Class A; the recycled water is used again by homes and parks for toilet flushing and watering gardens and sports ovals, and by farms for food crops and grass for animals.*

*(South East Water, “Recycled water”, southeastwater.com.au, retrieved 25 August 2026.)*

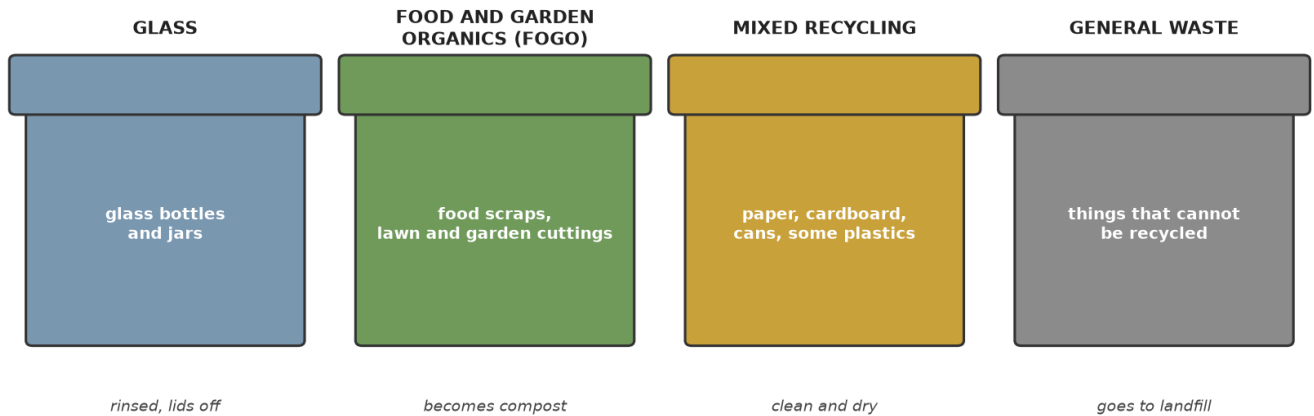
**Two fair points of view.** Some people feel unsure about using water that has been used before — that feeling is real and deserves to be heard. On the other side, Class A recycled water is treated and checked until it is safe for its uses, and recycling it means less water is taken from the reservoirs. Weighing both sides, recycling waste water is one of the strongest tools a city has for sustainable water.

## 6. Using and managing resources at school (draws on .E05)

Sustainability starts close to home — in your classroom and your school. Real things schools do:

- **Audit the waste.** An audit is a careful count. Count what your class throws away in a day, sort it into types, and look for the biggest kinds. That is how you find what to fix.
- **Go “nude food”.** A *nude food* lunch box carries food with no wrapping at all — an apple instead of a wrapped snack, a box of sandwiches instead of plastic bags. Less wrapping means less non-biodegradable waste.
- **Sort into the right streams.** Victorian households sort waste into four **streams** (four separate collections): glass; food and garden organics (FOGO), which is composted into new soil; mixed recycling; and general waste. Schools sort the same way. **Compost** is the rich soil-like stuff that food and garden waste becomes when it is broken down. **Landfill** is the place where general waste is buried when it cannot be recycled.

### Four streams: how Victorian households sort their waste



Sorting waste into streams means more of it is recycled and less goes to landfill. Check your own bins at home.  
Source: Sustainability Victoria, 'Household education for 4-stream recycling', sustainability.vic.gov.au. Retrieved 25 August 2026.

*Four labelled bins for Victoria's four waste streams: glass (glass bottles and jars, rinsed with lids off), food and garden organics or FOGO (food scraps and lawn and garden cuttings, which become compost), mixed recycling (paper, cardboard, cans and some plastics, clean and dry), and general waste (things that cannot be recycled, which go to landfill).*

*(The four streams: Sustainability Victoria, "Household education for 4-stream recycling", sustainability.vic.gov.au, retrieved 25 August 2026. Lid colours differ between councils — check your own bins at home.)*

- **Choose recycled products.** Paper and toilet paper made from recycled paper keep the timber loop turning: paper used → paper collected → paper made again.
- **Watch the timber.** When your school buys timber, timber from plantations (replanted farms of trees) keeps the renewable rule — never cut faster than regrown.

Here is a record sheet for your class audit. It is blank on purpose: the data is **your** data, collected by **you**.

### Classroom waste audit — record sheet (fill it in as you audit)

| Item found                | What is it made of? | How many? | Which stream is it? | Could we avoid it? |
|---------------------------|---------------------|-----------|---------------------|--------------------|
| Food scraps (e.g. fruit)  |                     |           |                     |                    |
| Paper or cardboard        |                     |           |                     |                    |
| Plastic wrapper or packet |                     |           |                     |                    |
| Drink can or bottle       |                     |           |                     |                    |
| Nude food (no wrapping)   |                     |           |                     |                    |
| Something else: _____     |                     |           |                     |                    |

Count what your class throws out in one day. Then ask: which items are biggest? What could we use less of, reuse, or recycle?

*A blank classroom waste audit record sheet with columns for the item found, what it is made of, how many, which stream it goes in, and whether it could be avoided; rows for food scraps, paper or cardboard, plastic wrapper or packet, drink can or bottle, nude food, and one row to add your own item.*

## Source to read and question

### Waste in Australia and Victoria — three facts to read

1. In 2016–17, Australia made about **67 million tonnes** of waste. That is about **2.7 tonnes for every person**. (*Department of the Environment and Energy, 2018, as printed in Wikipedia, “Waste management in Australia”, retrieved 25 August 2026.*)
2. About **58%** of that waste was recovered — recycled, composted or used to make energy. The rest went to landfill. (*Pickin, 2018, same source.*)
3. In Victoria, about **14,560 tonnes of litter** is dropped each year. About **75%** of it is cigarette butts and packaging. (*Keep Australia Beautiful, 2018, and EPA Victoria, 2019, same source.*)

## Worked examples

### Example 1 — with help: is Melbourne’s water being used sustainably? (draws on .E04)

Use the storage chart and the supply figures. Melbourne’s storages hold **1,810 GL** when full, and Melbourne uses about **1,250 million litres a day**.

| Working                                     | Comment                                                              |
|---------------------------------------------|----------------------------------------------------------------------|
| 1,250 million litres a day = 1.25 GL a day. | 1 GL is 1,000 million litres.                                        |
| $1.25 \times 365 =$ about 456 GL in a year. | Multiply the daily use by the days in a year.                        |
| $1,810 \div 456 \approx 4$ .                | Full storages hold about <b>4 years’</b> water, with no rain at all. |
| In most years, rain refills the storages.   | Renewal $\geq$ use, so the system stays sustainable.                 |

**Conclusion.** Water is a renewable resource because rain renews it. Melbourne’s water use is sustainable *for as long as* rain keeps refilling the storages at least as fast as the city uses the water. In a long drought, use would outrun renewal — which is why saving water (Way 1) and recycling it (Way 2) matter.

## Example 2 — with help: sorting waste and counting what piles up (draws on .E03)

Sort three items, then see what “added faster than nature can break it down” really means.

| Working                                                                                                   | Comment                                           |
|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| Banana skin → biodegradable (about 2 months to break down).                                               | Nature can break it down.                         |
| Plastic bag → non-biodegradable (10–20 years).                                                            | It breaks down slower than we add bags.           |
| Aluminium can → non-biodegradable (about 200 years).                                                      | Longer than your great-great-grandparents’ lives. |
| A class drops 5 plastic bags a week: $5 \times 52 = 260$ a year;<br>$260 \times 10 = 2,600$ in ten years. | Multiply by 52 weeks, then by 10 years.           |

**Conclusion.** In ten years about **2,600 plastic bags** are still sitting in the environment, because they are added far faster than they break down. That is not a sustainable use of the sink. The biodegradable banana skin is a different story: it is gone in months.

## Practice questions

### Practice with help

**Q1** (source; draws on .E03). From the “Source to read” box: about how many tonnes of waste did each person in Australia make in 2016–17? Which two kinds of items make up most of Victoria’s litter?

**Q2** (source; draws on .E05). From the same box: about what share of Australia’s waste was recovered, and where did the rest go? Name one stream from the four-stream chart that the recovered waste could have gone into.

**Q3** (draws on .E02). Look at the two-column resources table. Put each of these in a column and give one reason: (a) sunlight, (b) natural gas, (c) timber from a replanted plantation, (d) coal.

**Q4** (draws on .E03). Use the breakdown-times chart. (a) Which biodegradable item breaks down fastest? (b) Which item in the chart lasts longest? (c) About how many times longer does a plastic bottle (100 years) last than a cardboard box (2 months)? Hint: 100 years is 1,200 months.

**Q5** (draws on .E04). Use the storages chart. (a) Name the largest storage and how much it holds. (b) How much water do the three largest storages hold altogether?

**Q6** (draws on .E04). Use the Target 150 chart. (a) How many litres more than the 150-litre goal does the average person use each day? (b) A family of four each uses 13 litres too much every day for a week. How many extra litres is that altogether? (Hint:  $13 \times 4 \times 7$ .)

**Q7** (draws on .E05). Put each item into the right stream (glass / FOGO / mixed recycling / general waste): (a) a clean glass jar, (b) a banana skin, (c) clean cardboard, (d) a steel food tin, (e) a chip packet you cannot recycle, (f) grass clippings.

### Practice on your own

**Q8** (draws on .E02). Explain, in your own words, why cutting down more trees each year than are replanted is **not** sustainable. Use the words *renewable* and *renews*.

**Q9** (draws on .E03). A plastic bag blows into a park and then into a creek. Give two ways it could harm an animal or a plant before it breaks down.

**Q10** (draws on .E04). Think about the water you used today. (a) Name one storage or one way that recycled water is used again, from this section. (b) Suggest one way **you** could move your household towards 150 litres a person a day, and say what would make it easy or hard.

**Q11** (*draws on .E05*). Run a one-day classroom waste audit using the record sheet in this section. Then suggest **two** changes your class could make to create less waste. For each change, give one good effect it would have and one thing that might make it hard to do.

---

## Answers

**Q1.** About 2.7 tonnes per person. Cigarette butts and packaging (about 75% of the litter).

**Q2.** About 58% was recovered; the rest went to landfill. Any one of: mixed recycling (paper, cardboard, cans, plastics), glass, or FOGO (composted food and garden waste).

**Q3.** (a) Renewable — the sun shines every day. (b) Non-renewable — a fixed amount, formed over millions of years. (c) Renewable — the trees are replanted and regrow. (d) Non-renewable — mined from rock and cannot regrow.

**Q4.** (a) Paper towel (2–4 weeks). (b) Aluminium can (about 200 years; glass is unknown and not on the chart). (c)  $1,200 \div 2 = 600$  times longer.

**Q5.** (a) Thomson, 1,068 GL. (b)  $1,068 + 287 + 200 = 1,553$  GL.

**Q6.** (a)  $163 - 150 = 13$  litres. (b)  $13 \times 4 \times 7 = 364$  extra litres in a week.

**Q7.** (a) Glass. (b) FOGO. (c) Mixed recycling. (d) Mixed recycling. (e) General waste. (f) FOGO.

**Q8.** Sample: timber is a renewable resource, but only because trees regrow; if we cut more trees a year than we replant, we use the resource faster than it renews, so one day it runs out — that is not sustainable.

**Q9.** Sample: an animal (a bird, fish or turtle) might eat the bag or get tangled in it and be harmed; the bag might lie over soil or plants and block light and air, smothering them.

**Q10.** Sample: (a) the Thomson Reservoir, or Class A recycled water used for toilet flushing and gardens on the Mornington Peninsula; (b) a shorter shower saves tens of litres a day — easy because it needs no new equipment, hard because habits take time to change.

**Q11.** Sample: (1) nude-food lunch boxes — good effect: far less plastic in the general-waste bin; hard part: some snacks only come wrapped. (2) a paper-and-cardboard recycling box in the room — good effect: paper is recovered instead of buried; hard part: someone must empty it each week. Accept any two changes with one effect and one difficulty each.

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## Elaborations drawn on

Codes only, in VCAA order. Each elaboration's idea is taught in this book's own words, in the numbered part shown:

- .E01 — the environment as our source and our sink (Part 2)
- .E02 — the renewing rule for renewable resources (Part 3)
- .E03 — what sustainable waste disposal means (Part 4)
- .E04 — where one renewable resource comes from, and ways to use it sustainably (Part 5)
- .E05 — resources used and managed at school, the sustainable ways and the rest (Part 6)