

Mathematics Level 7

Chapter 3 — Climate and vegetation: how environments work

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Vegetation: its functions, its main types and where they grow

TEACHER-FACING METADATA – NOT STUDENT TEXT (the vocabulary gate excludes this block)

Section 3A – Chapter 3 – Strand: Geographical Knowledge and Understanding
Sub-strand: Diversity of places and environments

Owns: VC2HG4K04 (the trailing clause of the CD is the section 2A clause-level exclusion – see Exclusions)

Draws on (linkage keys per D7, VCAA export order):

VC2HG4K04.E01
VC2HG4K04.E02
VC2HG4K04.E03
VC2HG4K04.E04

Exclusions (TOC section 2A, Rule 1): VC2HG4K04.E05 is excluded, and the CD's trailing First Nations clause is the section 2A clause-level exclusion. Both are

recorded ACCEPTED and are never a gap: the neutral remainder of the CD is taught

in full below. No Aboriginal and Torres Strait Islander content is taught in this section.

Pairing (TOC Chapter 3 note): 3A is the functions-and-patterns section: what vegetation does; the main types and their characteristics; where they grow, across Australia and across the world; the vegetation pattern of the local place; and

factors other than climate that influence vegetation (soils, aspect, slope). 3B later takes the climate types; 3C joins the two maps.

Source lines for real-world data (D9), all checked 25 August 2026:

- Bureau of Meteorology, Climate statistics for Australian locations: station 031011 Cairns Aero; 014015 Darwin Airport; 043020 Mitchell Post Office; 086282 Melbourne Airport; 015590 Alice Springs Airport (long-term mean rainfall; page copies in _data/, retrieved 25 August 2026).
- Daintree Rainforest, Wet Tropics of Queensland: largest patch of tropical rainforest in Australia (Wikipedia, "Daintree Rainforest", viewed 25 August 2026).
- Great Victoria Desert: largest desert in Australia (Wikipedia, "Great Victoria Desert", viewed 25 August 2026).
- Mitchell Grass Downs: mostly-treeless grassland of inland Queensland, named for its Mitchell grasses (Wikipedia, "Mitchell grass downs", viewed 25 August 2026).
- Wilsons Promontory National Park: national park at the far south of Australia, with beaches, dunes, heath and forest close together (Wikipedia, "Wilsons Promontory National Park", viewed 25 August 2026).
- City of Melbourne tree-planting to cool streets: Melbourne Urban Forest Strategy (Wikipedia, "Ecology of Melbourne", viewed 25 August 2026).
- Coastline on the Australia map: Natural Earth 110m land, public domain.

Model figures (SOURCE_USE Rule 3, D9): all ten 3a_*.png figures are original drawings made for this book; the Australia and world maps are simplified models, labelled on their face as models, drawn over real Natural Earth coastlines.

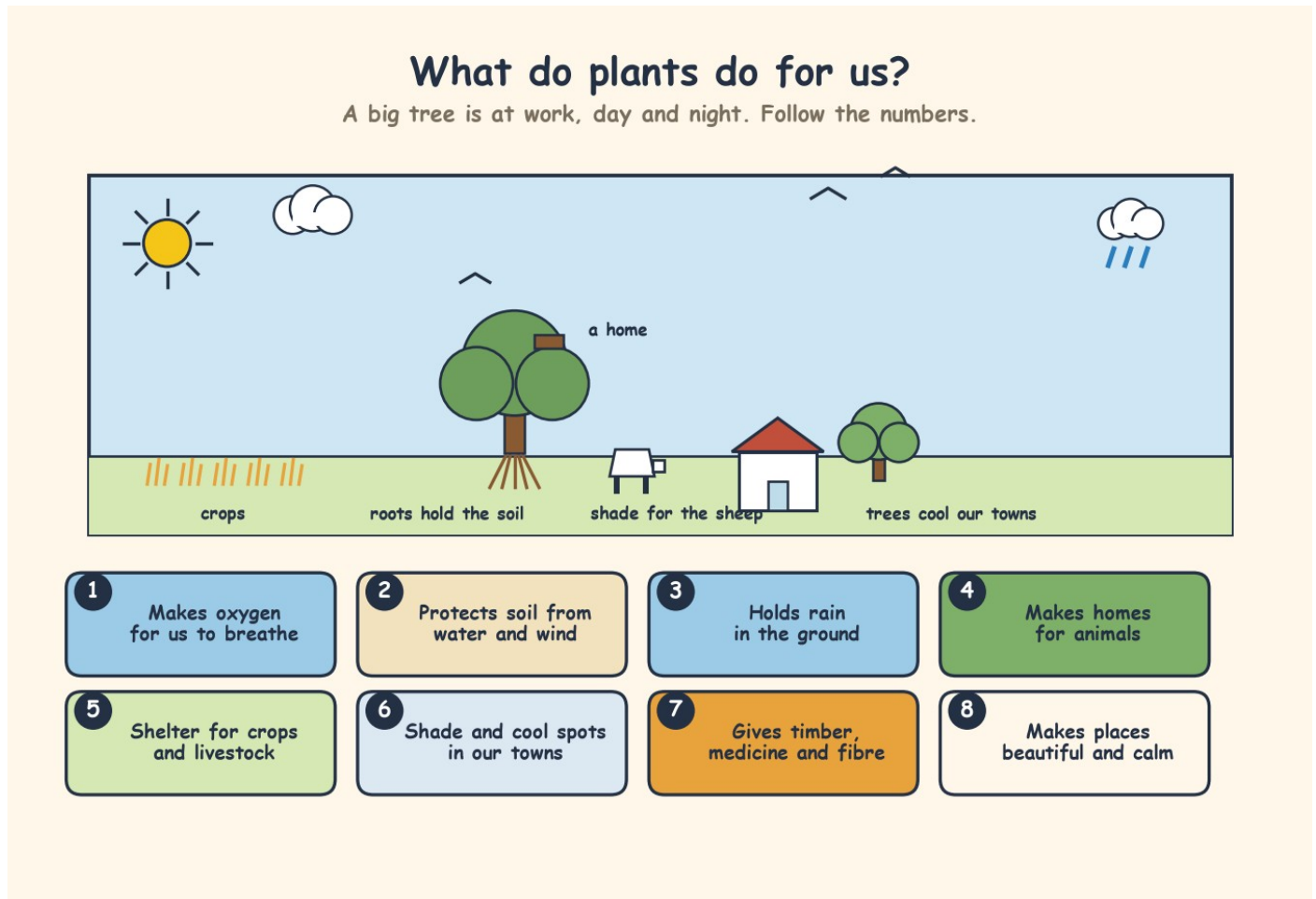
Volume (TOC calibration): one teaching sequence; two worked examples on real dated BoM data; six with-help and four on-your-own tasks; one teacher-supported fieldwork/source task mapping vegetation in the local place. Reading load Yr3.

Teaching sequence

What is vegetation?

The **vegetation** of a place is the plants that grow there - the trees, the grasses, the bushes and the little ground plants, all together. Every place on Earth has its own vegetation, even a bare-looking one.

Vegetation is always at work. Here are its jobs.



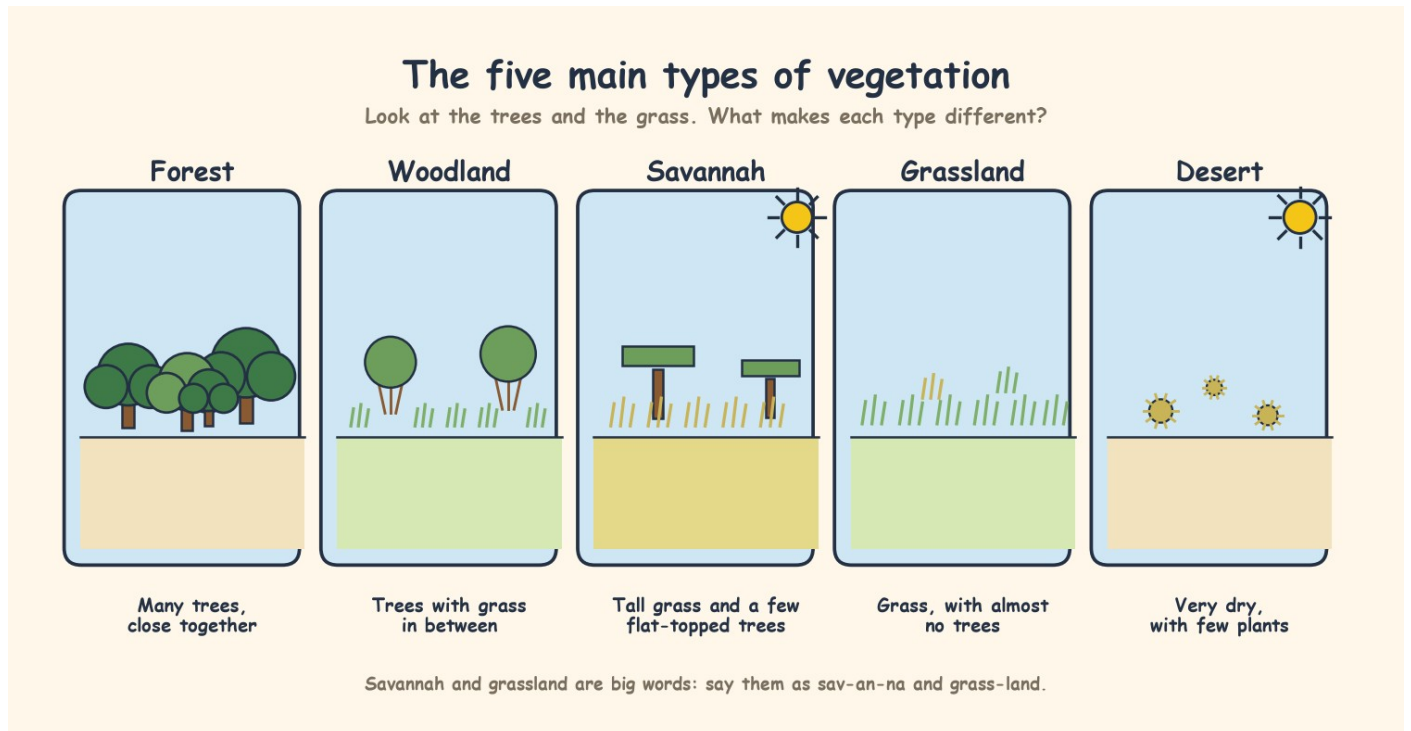
A park scene with a big tree, a sheep in its shade, crops, a house and a rain cloud, above eight numbered cards. Card 1: Makes oxygen for us to breathe. Card 2: Protects soil from water and wind. Card 3: Holds rain in the ground. Card 4: Makes homes for animals. Card 5: Shelter for crops and livestock. Card 6: Shade and cool spots in our towns. Card 7: Gives timber, medicine and fibre. Card 8: Makes places beautiful and calm.

- Plants make the **oxygen** in the air. Oxygen is the gas that every land animal - people included - breathes in to stay alive.
- Plant roots hold the soil, so water cannot wash it away and wind cannot blow it away. That washing and blowing away of soil is called **erosion**.
- Plants hold rain in the ground like a sponge, so the water stays for later.
- Plants are homes. Birds nest in trees, and so many little animals live in grass and leaves. The home of a plant or animal is its **habitat**.
- Lines of trees **shelter** crops and farm animals from hot, strong wind. A line of trees planted to stop wind is called a **windbreak**.
- Trees give **shade** for people, and leafy streets help cool our towns on hot days.
- Plants give us **timber** (wood), **fibre** (the stringy bits plants are made of, for paper and cloth) and some of our **medicines**.

- Green, leafy places are beautiful and calm to be in.

The five main types

Geographers (people who study places) sort the world's vegetation into a few main types. We use five.



Five panels. Forest: many trees growing close together. Woodland: trees with grass in between. Savannah: tall grass and a few flat-topped trees. Grassland: grass, with almost no trees. Desert: very dry ground with a few spinifex clumps and a hot sun.

- **Forest** - many trees growing close together, so the ground is cool and dark.
- **Woodland** - trees with room to spread, and grass growing below.
- **Savannah** - tall grasses with some trees here and there.
- **Grassland** - grass, with almost no trees.
- **Desert** - very dry, with few plants, and the plants grow far from each other.

The five types, at a glance

Type	What is it like?	Where in Australia?
Forest	Many trees growing close together	Wet parts of the south-east and north-east
Woodland	Trees with room to spread, grass below	Much of inland and southern Australia
Savannah	Tall grass with some trees	Northern Australia, to Cape York
Grassland	Mostly grass, with almost no trees	Inland Queensland and the dry inland plains
Desert	Very dry, with few plants	The middle of Australia

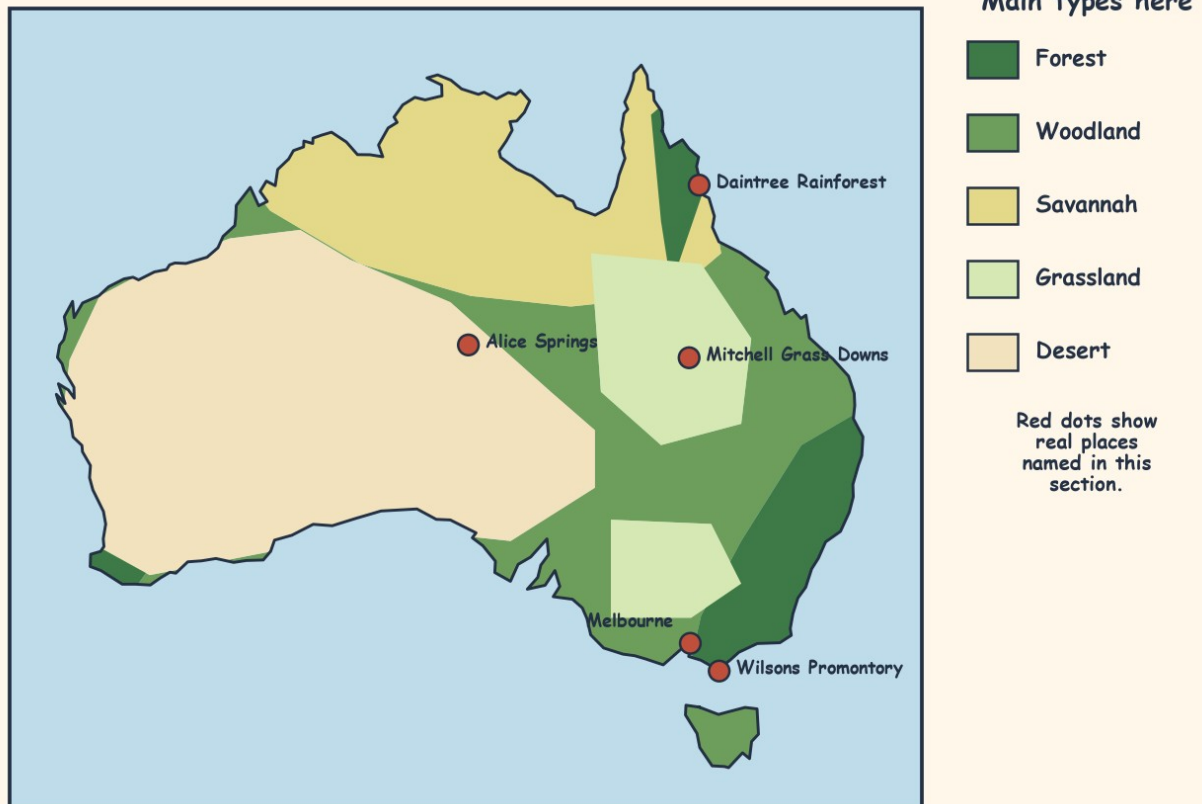
Made for this book, from the Australian vegetation map.

A table of the five types of vegetation. For each type: what it is like, and where it grows in Australia. Forest: wet parts of the south-east and north-east. Woodland: much of inland and southern Australia. Savannah: northern Australia, to Cape York. Grassland: inland Queensland and the dry inland plains. Desert: the middle of Australia.

Where each type grows in Australia

Now the map. Wet places grow forests; dry places grow deserts; the in-between places grow savannah, grassland and woodland.

Where each type grows in Australia



Made for this book on a real map of Australia. Region edges are kept simple.

A map of Australia showing where each main type of vegetation grows: forest in the wet south-east and north-east, woodland over much of the inland and south, savannah across the north, grassland in inland Queensland and on the dry inland plains, and desert in the middle. Red dots mark real places: Daintree Rainforest, Alice Springs, Mitchell Grass Downs, Melbourne and Wilsons Promontory.

Some real places to remember:

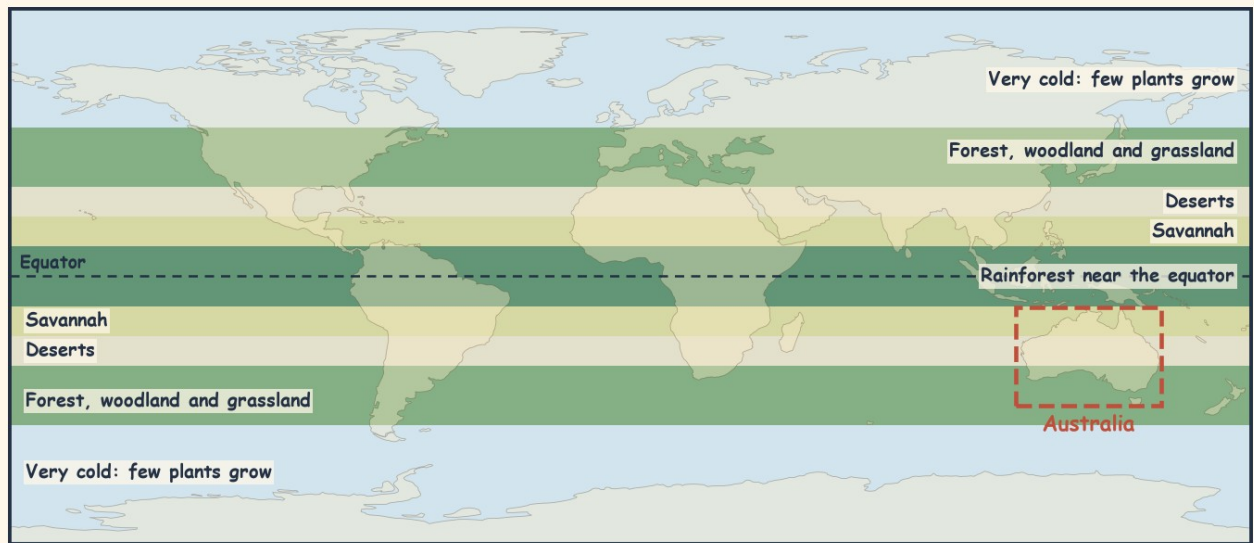
- The **Daintree Rainforest**, in north Queensland, is the biggest patch of tropical rainforest in Australia. A **rainforest** is a thick, wet forest.
- The **Mitchell Grass Downs**, in inland Queensland, are grassland: a sea of grass with almost no trees, named for their Mitchell grasses.
- The **Great Victoria Desert** is the biggest desert in Australia - dry red sand, spinifex hummocks, and plants far from each other.
- Near Melbourne and at **Wilsons Promontory**, in the far south, the wetter ground grows forest and woodland.

Around the world

The same five types grow right around the world, in bands. The **equator** is a line around the middle of the Earth, halfway between the cold ends. People draw it on maps.

Places near the equator are hot and often wet, so thick forest grows there. Moving out from the equator, the bands go savannah, then desert, then forest, woodland and grassland, and then land too cold for many plants.

Vegetation in bands around the world



The same bands appear north and south of the equator. Australia sits across the savannah, desert and forest bands.

A map of the world with colour bands. Near the equator: rainforest. Out from the equator: savannah, then deserts, then forest, woodland and grassland. Far from the equator: very cold land where few plants grow. The same bands repeat north and south of the equator. A red broken box shows where Australia sits.

Australia sits across the savannah, desert and forest bands. That is why our north is savannah, our middle is desert, and our wet south and east corners are forest and woodland.

Climate and vegetation

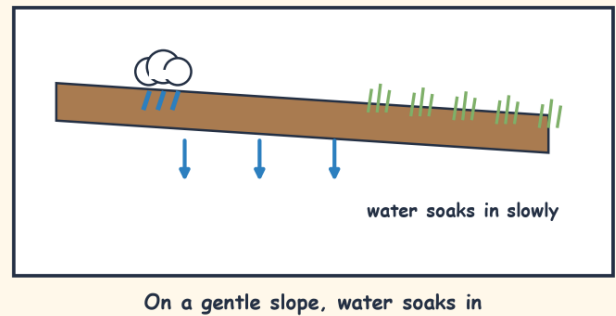
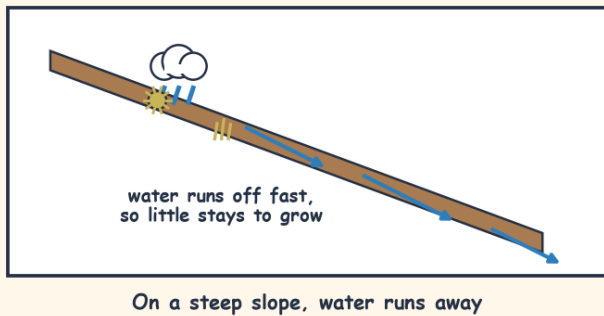
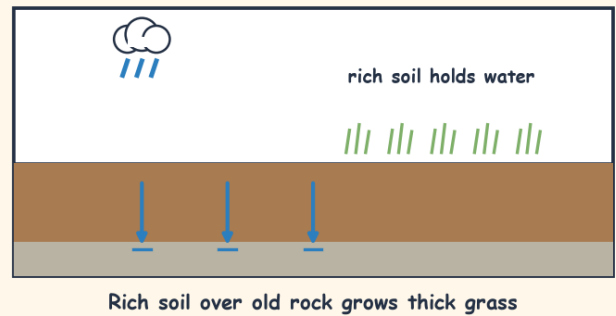
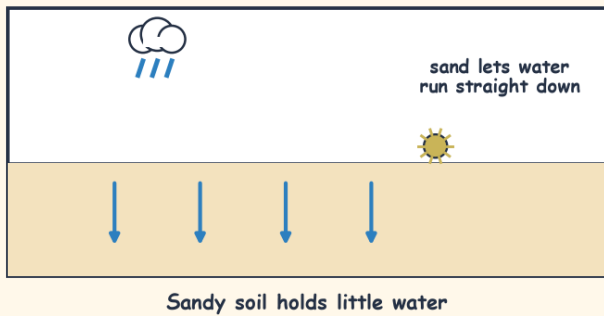
The **climate** of a place is its weather counted over many years. Climate is the big chooser of vegetation: plants need water and warmth, so the climate of a place helps choose the plants that grow there. Wet, warm climates grow forests. Dry climates grow deserts. We will see this again with real rain numbers in the worked examples below.

Other things that change what grows

Climate is the big chooser - but three helpers can change the picture in one small spot: **soils**, **slope** and **aspect**. The soil is the top layer of ground plants grow in. The slope is how steep the ground is. The aspect is the way a slope faces.

Soil and slope change what grows

Rain is the same in each picture. Look at what happens to it.

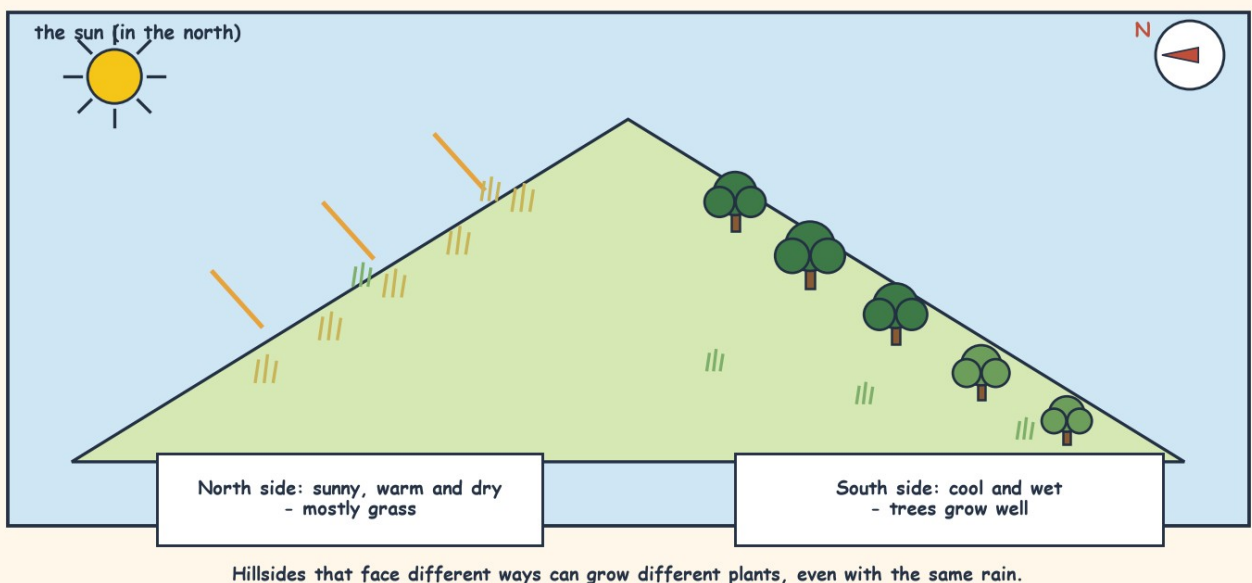


Four panels, all with the same rain. Sandy soil: water runs straight down and little stays, so few plants grow. Rich soil over old rock: water is held, so thick grass grows. A steep slope: water runs off fast, so little stays to grow. A gentle slope: water soaks in slowly, so grass grows well.

Sandy soil holds little water, so few plants grow on it. Rich, deep soil holds water, so thick grass grows. On a steep slope the rain runs off fast; on a gentle slope it soaks in.

Two sides of one hill

In Australia the sun shines from the north. Watch what that does.

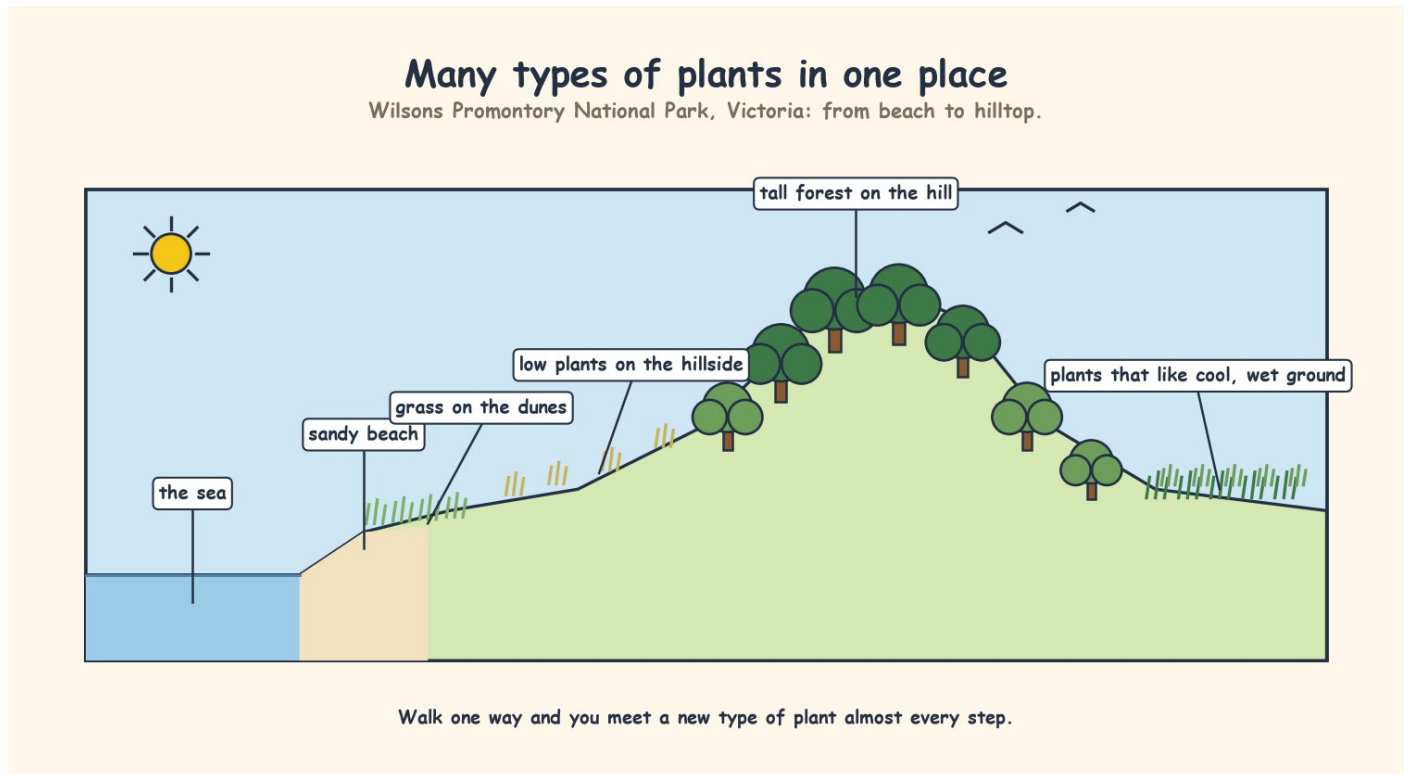


A hill in Australia with the sun in the north. The north side of the hill is sunny, warm and dry, and grass grows there. The south side is cool and wet, and trees grow well. A compass shows north pointing towards the sun.

In Australia the sun shines from the north. So a hillside facing north is sunny, warm and dry, and a hillside facing south is cool and wet. The two sides of the same hill can grow different plants, even with the same rain.

Many types in one place

You do not need to travel far to see more than one type. At Wilsons Promontory National Park, in the far south of Australia, a one-day walk goes from the sea, over the sandy beach and the grassy sand hills, past low plants on the hillsides, up into tall forest, and down into cool, wet valleys. That is the distribution of vegetation in one local place - where each plant type sits, and why.



A picture that cuts across Wilsons Promontory National Park: the sea, a sandy beach, grass on the sand hills, low plants on the hillside, tall forest on the hill, and cool, wet plants in the valley. Each part has a label with a line to it.

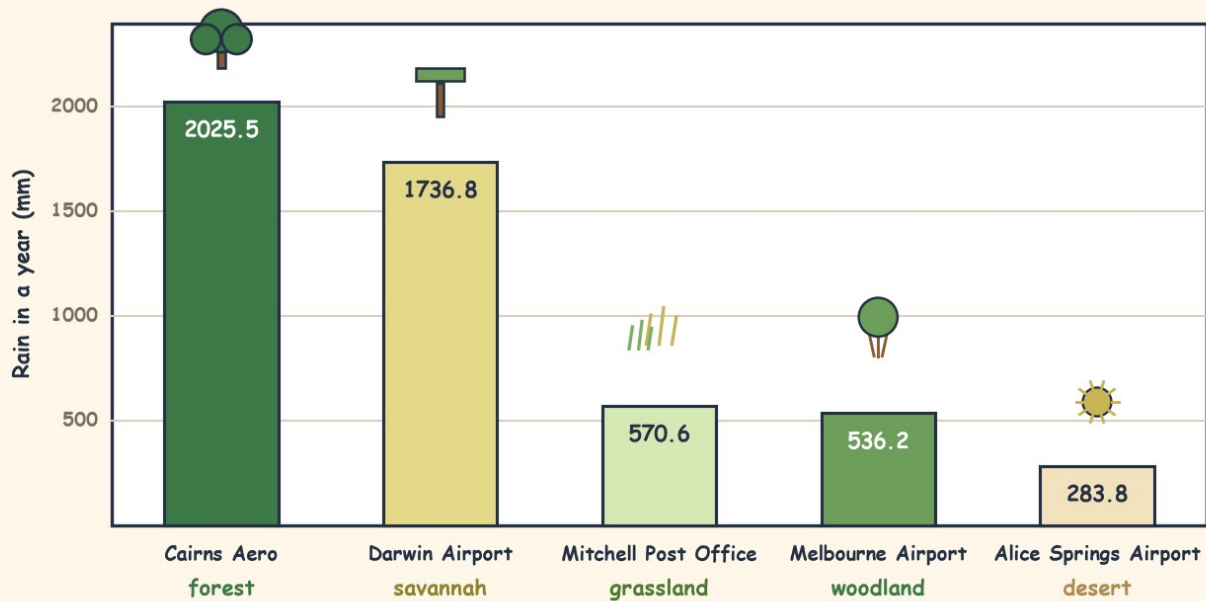
Worked examples

Example 1 - with help: more rain, more plants

Here are real rain numbers from the Bureau of Meteorology, counted over many years at five real places in Australia. We count rain in mm; a very wet year is about 2000 mm.

More rain, more plants

Real rain numbers from five weather stations in Australia.



Bureau of Meteorology mean rain, 1884-2026 (viewed 25 August 2026).

A bar graph titled *More rain, more plants*. Rain in a year at five real places in Australia, each with a plant picture and a type. Cairns Aero: 2025.5 mm, forest. Darwin Airport: 1736.8 mm, savannah. Mitchell Post Office: 570.6 mm, grassland. Melbourne Airport: 536.2 mm, woodland. Alice Springs Airport: 283.8 mm, desert.

Step 1 - find the wettest place. Cairns Aero, with 2025.5 mm of rain in a year. Its vegetation is forest - thick, wet rainforest.

Step 2 - find the driest place. Alice Springs Airport, with only 283.8 mm. Its vegetation is desert.

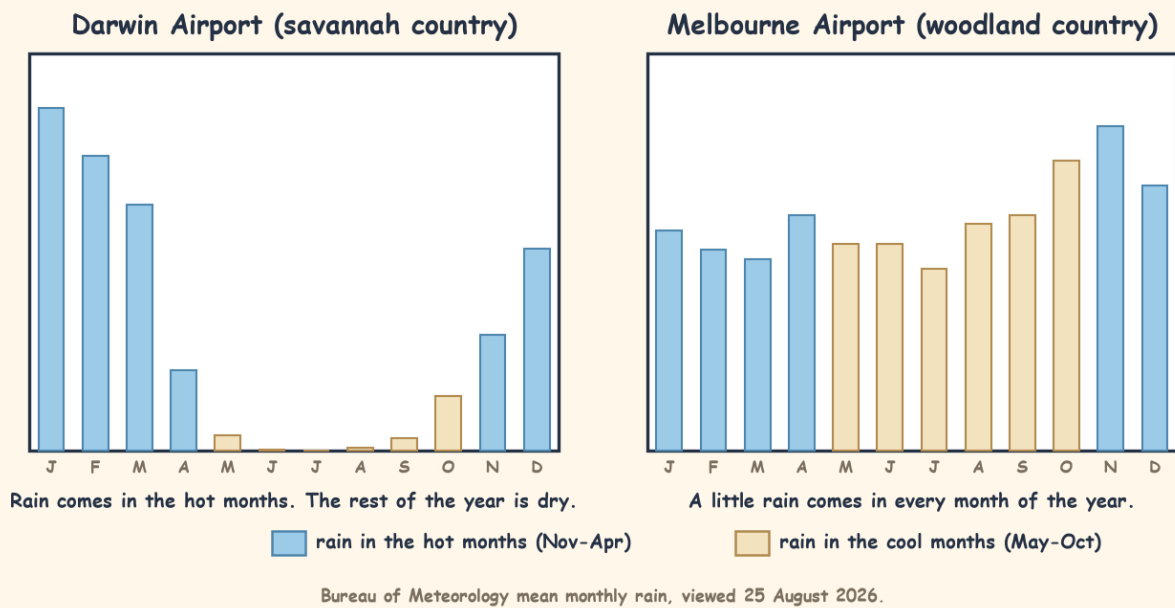
Step 3 - look down the graph. From left to right, the rain gets less - and the plants get fewer and smaller. Forest, savannah, grassland, woodland, desert.

So the climate - here, how wet a place is - helps choose the vegetation. More rain, more plants.

Example 2 - with help: when the rain comes matters too

Two places can get rain in different seasons. In Australia our hot months are November to April (our summer and autumn), and our cool months are May to October.

When does rain come?



Two bar graphs of rain month by month, real numbers. Darwin Airport: tall bars from November to April, with 432.1 mm in January, and tiny bars from May to October, with 1.1 mm in July. Melbourne Airport: a little rain in every month of the year.

Step 1 - read Darwin. Almost all of Darwin's rain falls from November to April, the hot months. That is the wet season. From May to October, the dry season, almost no rain falls.

Step 2 - read Melbourne. Melbourne gets a little rain in every month, hot or cool. There is no long dry season.

Step 3 - match the plants. Darwin's pattern - a big wet season and a long dry season - grows savannah: grasses that drink in the wet and wait out the dry. Melbourne's rain-all-year pattern helps grow woodland and forest, with grassland on its drier plains.

So it is not only how much rain falls. When it falls matters too. That is part of how climate and vegetation are linked.

Practice tasks

With help

Q1. Look at the jobs-of-plants picture. (a) Which gas do plants make for us to breathe? (b) What do plant roots stop being washed and blown away? (Hint: job 2) (c) What is the home of a plant or animal called? (d) What do we call a line of trees planted to stop wind?

Q2. Name the type: forest, woodland, savannah, grassland or desert. (a) tall grasses with some trees here and there (b) many trees growing close together (c) very dry, with few plants far from each other (d) grass, with almost no trees (e) trees with room to spread, and grass below

Q3. Look at the Australia map. (a) Which type grows across the north of Australia? (b) Which type grows in the middle of Australia? (c) The Daintree Rainforest dot sits in which type? (d) The Mitchell Grass Downs dot sits in which type?

Q4. Look at the world bands map. (a) What grows near the equator? (b) Going from the savannah band to the cold land, which bands do you pass? (c) Does Australia sit across the cold bands, or across the savannah, desert and forest bands?

Q5. Look at the soil and slope picture. (a) Which soil holds more water: sandy soil, or rich soil over old rock? (b) On which slope does rain soak in: the steep one, or the gentle one? (c) Why do few plants grow on sandy soil?

Q6. Look at the two-sides-of-a-hill picture. (a) In Australia, which side of a hill gets more sun? (b) Which side is warm and dry? (c) Which side grows more trees?

On your own

Q7. Alice Springs and Cairns are both in Australia, but one grows desert plants and one grows rainforest. Use the rain numbers from Example 1 to say why.

Q8. A farmer plants a line of trees along the windy side of a crop field. Name this line of trees, and say what it does for the crops and the animals.

Q9. Two hills get the same rain. Hill A has rich, deep soil. Hill B has sandy soil. Which hill will grow thicker grass? Say why.

Q10. Wilsons Promontory has beach, dunes, hillside, forest and valley close together. Pick two of these parts and say how their plants are different.

Source task - a walk in your local place

Your teacher will help with this one.

Part 1 - read the real map. Look again at the Australia map with the red dots. (a) Which red-dot place sits in desert country? (b) Which red-dot place is a national park by the sea in the far south? (c) Which two red-dot places are in Queensland?

Part 2 - walk your local place. With your teacher, walk around your school ground or a nearby park. Look for the plants: trees, grass, garden beds, nature strips. (d) Draw a simple sketch map of the place. Use one colour or symbol for trees, one for grass, and one for garden plants. Add a key so a friend can read it. (e) Write one sentence about where the plants are: for example, “The trees grow along the _____.” (f) One slope, fence or garden bed may be sunnier than another. Which way does it face - north or south?

Answers

Q1. (a) Oxygen. (b) Soil. (c) A habitat. (d) A windbreak.

Q2. (a) savannah (b) forest (c) desert (d) grassland (e) woodland.

Q3. (a) Savannah. (b) Desert. (c) Forest. (d) Grassland.

Q4. (a) Rainforest (thick forest). (b) The desert band, then the forest, woodland and grassland band. (c) Across the savannah, desert and forest bands.

Q5. (a) Rich soil over old rock. (b) The gentle one. (c) Water runs straight down through sand, so little stays for plants.

Q6. (a) The north side. (b) The north side. (c) The south side.

Q7-Q10. See the example answers below.

Source task. (a) Alice Springs. (b) Wilsons Promontory National Park. (c) Daintree Rainforest and Mitchell Grass Downs. (d-f) Maps and sentences will be different; check that the key matches the symbols, and that the sentence says where the plants are.

Example answers

Q7. “Cairns gets 2025.5 mm of rain in a year and Alice Springs gets only 283.8 mm. Rainforest trees need lots of water, so they grow at wet Cairns. Desert plants need very little, so they grow at dry Alice Springs. The rain is the difference.”

Q8. “The line of trees is a windbreak. It stops the strong wind, so the crops are sheltered and the soil does not blow away, and the farm animals get shade and shelter.”

Q9. “Hill A will grow thicker grass. Rich, deep soil holds the rain water, so the grass can drink it. On Hill B, water runs straight down through the sand and little stays.”

Q10. “On the beach and sand hills there is sand and grass, and on the hill there is tall forest. The beach gets salt wind and has sandy soil, so only strong grass grows. The hill has deep soil and shelter, so tall trees grow.”

Where we found these facts

People who study places always say where they found things out. So do we.

- Rain numbers for Cairns Aero (031011), Darwin Airport (014015), Mitchell Post Office (043020), Melbourne Airport (086282) and Alice Springs Airport (015590): Bureau of Meteorology, *Climate statistics for Australian locations*.
- Daintree Rainforest, Great Victoria Desert, Mitchell Grass Downs, Wilsons Promontory National Park, and Melbourne’s street trees: Wikipedia, viewed 25 August 2026.
- The shape of the land on our Australia map: Natural Earth, free for anyone to use.
- The coloured regions on the maps are a model made for this book. The real country is not in straight blocks like that, but the big pattern is true.

All checked on 25 August 2026.

Climate: how it differs from weather, and the main climate types

Owens: VC2HG4K06

In January, Melbourne families pack hats for the beach while families in San Francisco pack jackets — yet the two cities sit at almost the same latitude. In this section we meet **climate**, the average pattern of weather at a place, and the six main climate types of Australia and the world.

Things you need: a pencil, a ruler, scissors for the cards in Figure 2, and the figures in this section.

What we learn

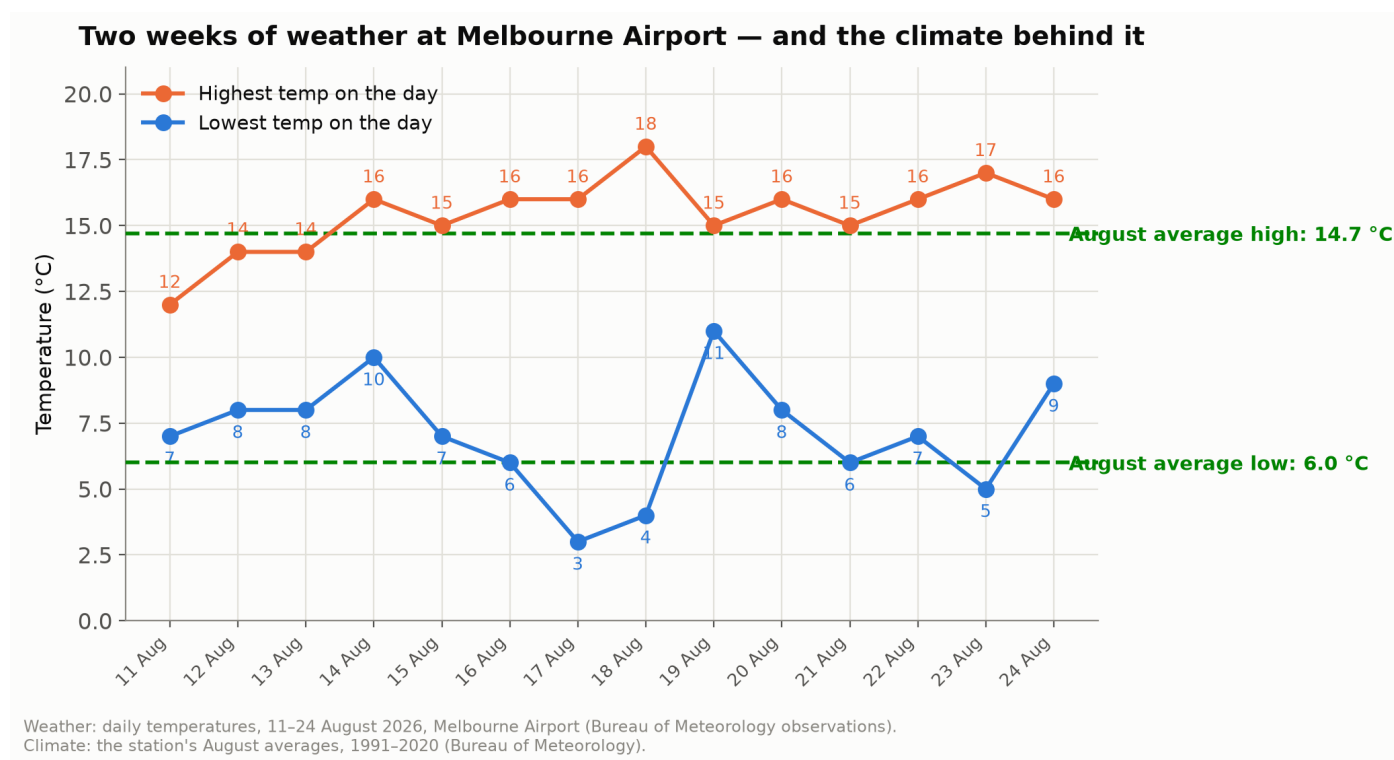
Weather is today — climate is the average pattern

The sky does something every day. It might be sunny, cloudy, windy or rainy. The air is hot in the afternoon and colder before sunrise. **Weather** is what the sky and the air are like right now, today, in one place.

Temperature is how hot or cold the air is. We measure it in **degrees Celsius (°C)** with a **thermometer**, the tube or screen number that tells you how hot it is.

Climate is the average pattern of weather at a place over a long time — about 30 years. It tells you what each season is like there most years: how hot the summers get, how cold the winters get, and when the wet months come. (You already know the four seasons in Australia: summer, autumn, winter, spring.)

Here is a trick that always works: *weather is what you get today; climate is what you expect most years.*



A line graph titled *Two weeks of weather at Melbourne Airport, and the climate behind it*. Two jump-up-and-down lines show each real day from 11 to 24 August 2026: the red line is the highest temperature on the day (12 to 18 °C) and the blue line is the lowest (3 to 11 °C). Two flat broken green lines show the climate: August average high 14.7 °C and August average low 6.0 °C.

Figure 1. Fourteen real days of weather at Melbourne Airport, shown against the station's August climate. The daily lines jump about; the average lines sit flat.

Figure 1 shows both ideas at once. The red and blue lines are the **weather**: the real highest and lowest temperature of each day, jumping up and down. The two flat broken green lines are the **climate**: the August averages, worked out from 30 years of Augusts at this station. Some days beat the average; some days fall short of it. That is exactly the difference between weather and climate.

Is it weather, or is it climate?

Sort each card into the right box.

WEATHER What is happening on one day, in one place	CLIMATE The usual pattern of weather over a long time
It is raining in Melbourne today	Darwin has a Wet season from about December to March
Perth gets most of its rain in winter	Right now it is 28 °C and windy
Most years, Alice Springs is very hot and very dry	We had a sunny morning and a storm after lunch

A sorting board titled *Is it weather, or is it climate?* with two big blank boxes, *WEATHER* (what is happening on one day, in one place) and *CLIMATE* (the average pattern of weather over a long time), and six cut-out cards below: *It is raining in Melbourne today*; *Darwin has a Wet season from about December to March*; *Right now it is 28 °C and windy*; *Perth gets most of its rain in winter*; *Most years, Alice Springs is very hot and very dry*; *We had a sunny morning and a storm after lunch*.

Figure 2. A sorting board. Cut out the six cards and put each one in the right box.

Let us sort two cards together. *It is raining in Melbourne today* talks about **today**, so it is weather. *Perth gets most of its rain in winter* talks about the average pattern, year after year, so it is climate. You sort two more cards in Question 1 and the last two in Question 7.

The six main climate types

Places with the same kind of climate are grouped into **climate types**. This section teaches six of them.

The six main climate types in this section

Climate type	Example place	How it feels	Rain
 semi-arid	Broken Hill	Hot summers; cool winters	Little rain every season (249 mm a year)
 temperate	Melbourne	Warm summers; cool winters	Rain in every season (515 mm a year)
 Mediterranean	Perth	Hot dry summers; mild winters	Most rain in winter (724 mm a year)
 tropical	Darwin	Hot all year	A wet and a dry season (1,832 mm a year)
 arid	Alice Springs	Very hot days; cool nights	Very little rain (275 mm a year)
 equatorial	Singapore	Hot all year	Rain nearly every month (2,113 mm a year)

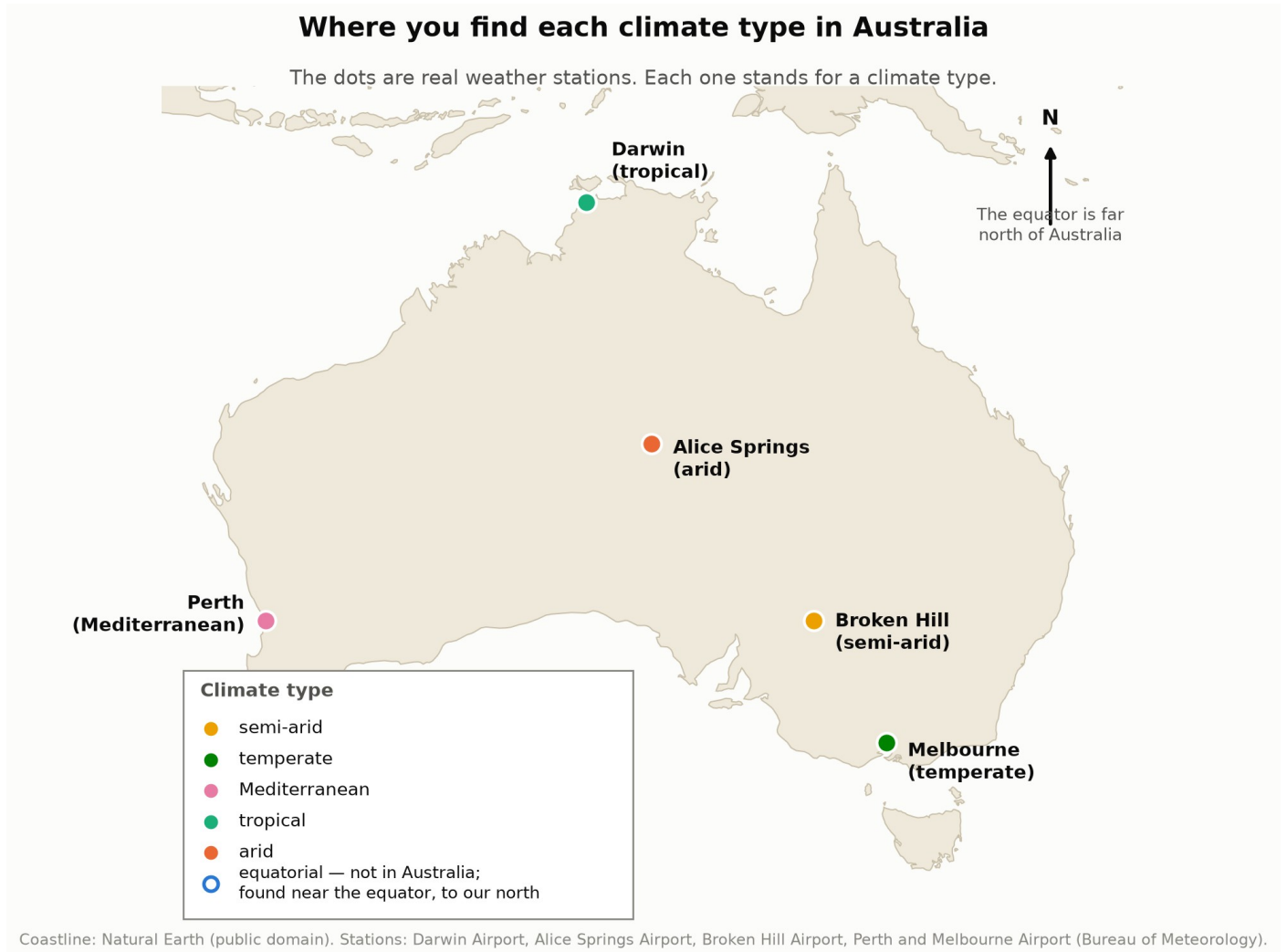
Numbers are long-term averages for each example place (Bureau of Meteorology; Singapore National Environment Agency).

A table of the six climate types with an example place, how it feels and the rain. Equatorial: Singapore, hot all year, rain nearly every month, 2,113 mm a year. Tropical: Darwin, hot all year, a wet and a dry season, 1,832 mm a year. Arid: Alice Springs, very hot days and cool nights, 275 mm a year. Semi-arid: Broken Hill, hot summers and cool winters, 249 mm a year. Temperate: Melbourne, warm summers and cool winters, rain in every season, 515 mm a year. Mediterranean: Perth, hot dry summers and mild winters, most rain in winter, 724 mm a year.

Figure 3. The six main climate types, each with a real example place and its real numbers.

- **Equatorial** — hot all year, with rain nearly every month. Found close to the equator.
- **Tropical** — hot all year, with a wet season and a dry season.
- **Arid** — desert country: very little rain, very hot days and cool nights.
- **Semi-arid** — dry country, with a little rain in most seasons.
- **Temperate** — warm summers, cool winters, and rain in every season.
- **Mediterranean** — hot, dry summers and cool, wet winters.

Where each type is in Australia



A map of Australia with five real weather stations marked by coloured dots: Darwin (tropical) in the north, Alice Springs (arid) in the middle, Broken Hill (semi-arid) inland in the south-east, Perth (Mediterranean) by the coast in the south west, and Melbourne (temperate) in the south-east. A legend lists all six types and notes that the equatorial type is not in Australia but near the equator, far to our north. An arrow marks north.

Figure 4. Five real weather stations — places where the Bureau of Meteorology keeps weather records — each standing for a climate type.

Follow the map. **Darwin**, far in the north, is tropical: hot all year with a Wet season and a Dry season. **Alice Springs**, in the middle, is arid desert country. **Broken Hill**, inland in the south-east, is semi-arid. **Perth**, by the coast in the south west, is Mediterranean. **Melbourne**, in the south-east, is temperate. No part of Australia is equatorial — the equator is far to our north, so the hot all-year-rain type sits beyond our top of the map.

Where each type is in the world

Four new words for reading world maps:

- **Equator** — the line around the middle of the Earth, halfway between the North Pole and the South Pole.

- **Hemisphere** — a half of the Earth. The northern hemisphere is the top half; the southern hemisphere is the bottom half. Australia is in the southern hemisphere.
- **Latitude** — how far north or south a place is from the equator, counted in degrees (°).
- **The tropics** — the hot belt around the equator, between the two tropic lines on the map. The **poles** are the far north and far south ends of the Earth.



A world map shaded in wide bands: a hot zone near the equator, a tropical zone either side of it, a temperate zone further out, and a cold polar zone near the poles. The Equator, the Tropic of Cancer, the Tropic of Capricorn and the Arctic Circle are shown as latitude lines. Real places are marked: Singapore in the hot zone just north of the equator, Perth and Melbourne in the southern temperate zone, San Francisco in the northern temperate zone, with a broken line joining San Francisco and Melbourne to show they sit at almost the same latitude on opposite sides of the equator.

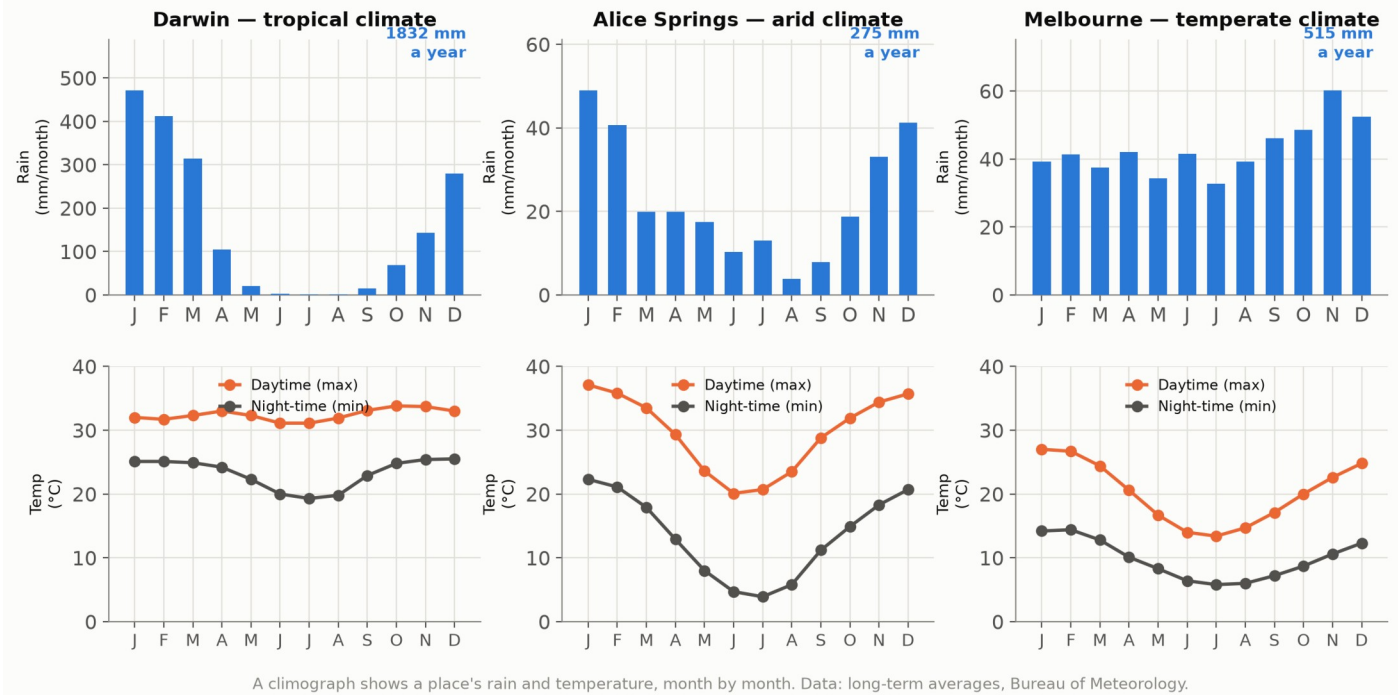
Figure 5. Climate zones run in wide bands (long stripes) around the Earth: hot near the equator, cold near the poles. A climate zone is a wide area where one kind of climate is found.

Look at the bands. The equatorial type hugs the equator. The tropical type sits either side of it, in the tropics. Arid and semi-arid country sits near the two tropic lines (the map names them the Tropic of Cancer in the north and the Tropic of Capricorn in the south). Temperate and Mediterranean climates sit further out, in the middle latitudes, and cold climates sit near the poles. Climate follows latitude.

Reading a climograph

A **climograph** is a graph of a place's climate. For each of the twelve months it shows the rain in **millimetres (mm)** — the little steps on your ruler — as blue bars, and the daytime and night-time temperatures as lines.

Climographs: a year of rain and temperature in three places

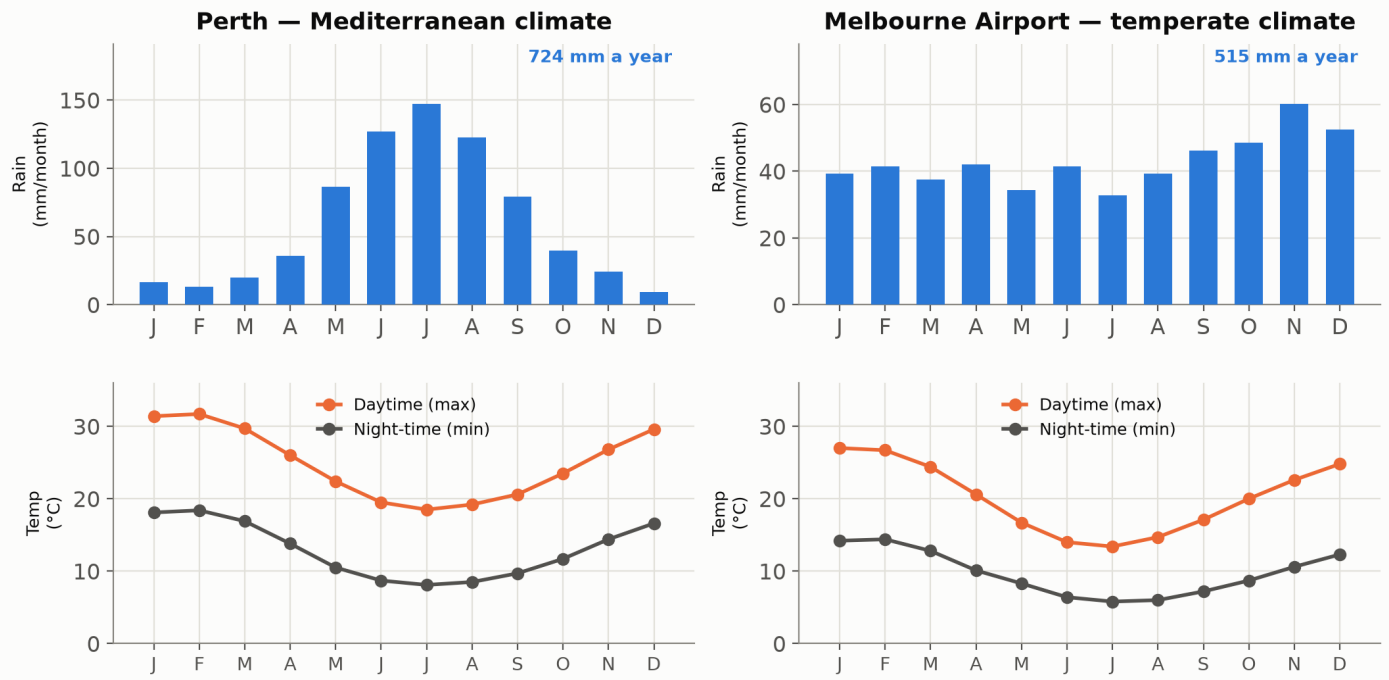


Three climographs side by side. Darwin: very tall rain bars from December to March (January about 470 mm) and almost no rain from May to September, hot line all year. Alice Springs: short rain bars in every month and a big gap between hot days and cool nights. Melbourne: middle rain bars in every month, warm summer days and cool winter days.

Figure 6. Three climographs. Tall bars mean a wet month; short bars mean a dry month.

Read Darwin first. The bars tower from December to March — the Wet season — then shrink to almost nothing from May to September — the Dry season. Alice Springs has short bars all year: not much rain, ever. Melbourne has middle bars in every month: rain in every season. The shape of the bars tells you the climate type.

Two cities, two rain patterns: Perth and Melbourne



Perth gets most of its rain in winter. Melbourne gets rain all year round. Data: Bureau of Meteorology averages.

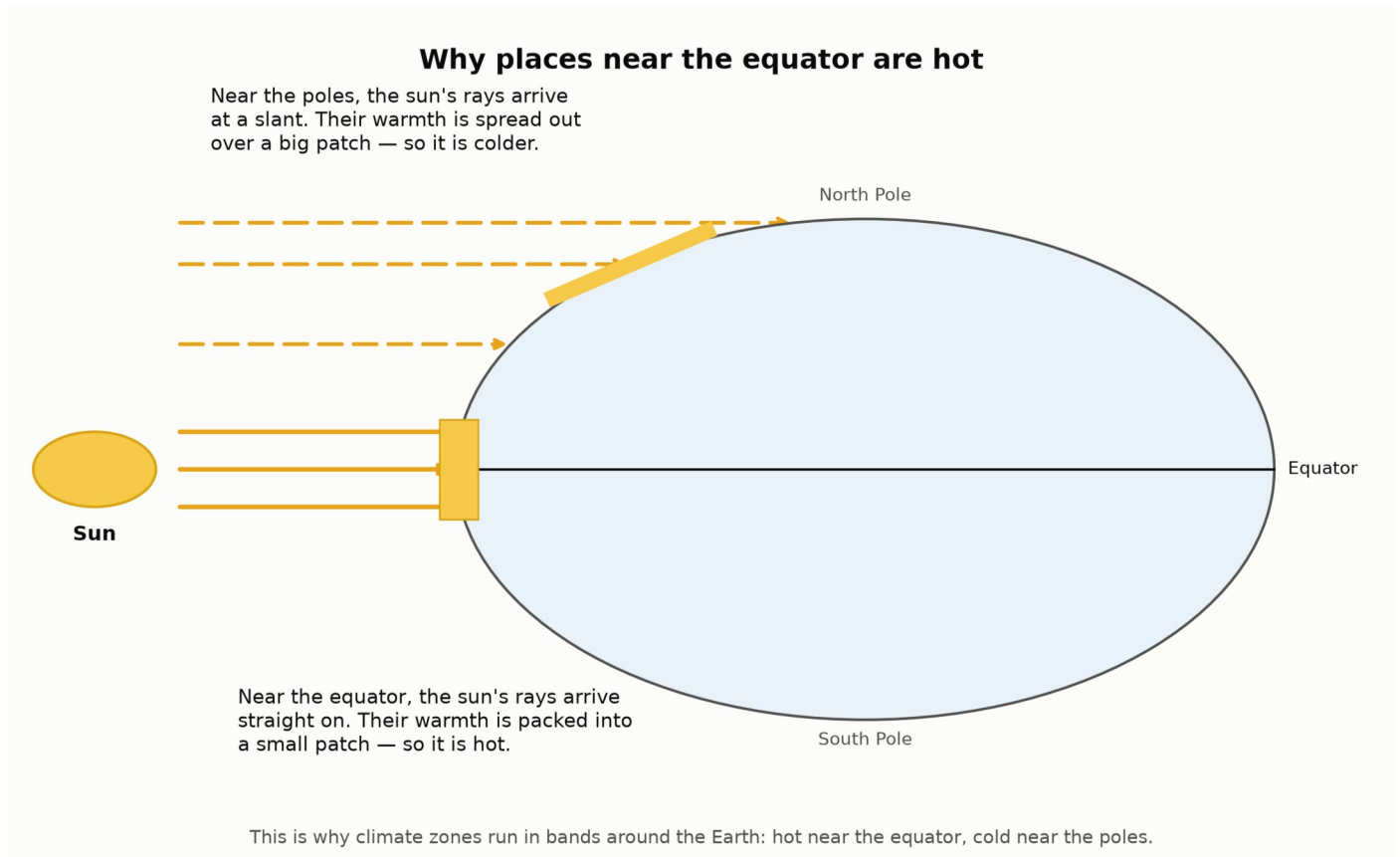
Two climographs side by side. Perth: tall rain bars in June, July and August and tiny bars in December, January and February — most rain in winter. Melbourne: middle bars all year round. Both have warm summer days and cool winter days.

Figure 7. Same country, different rain patterns: Perth's rain piles up in winter, while Melbourne's rain spreads across the year.

Now compare Perth and Melbourne. Perth's bars pile up in June, July and August — winter — and almost vanish in summer. That winter-wet pattern is the fingerprint of the Mediterranean type. Melbourne's bars stay middle-sized all year: the temperate type.

Why climates sit where they do

Sunlight reaches the Earth in **rays** — straight lines of light and warmth. Figure 8 shows what happens to those rays.



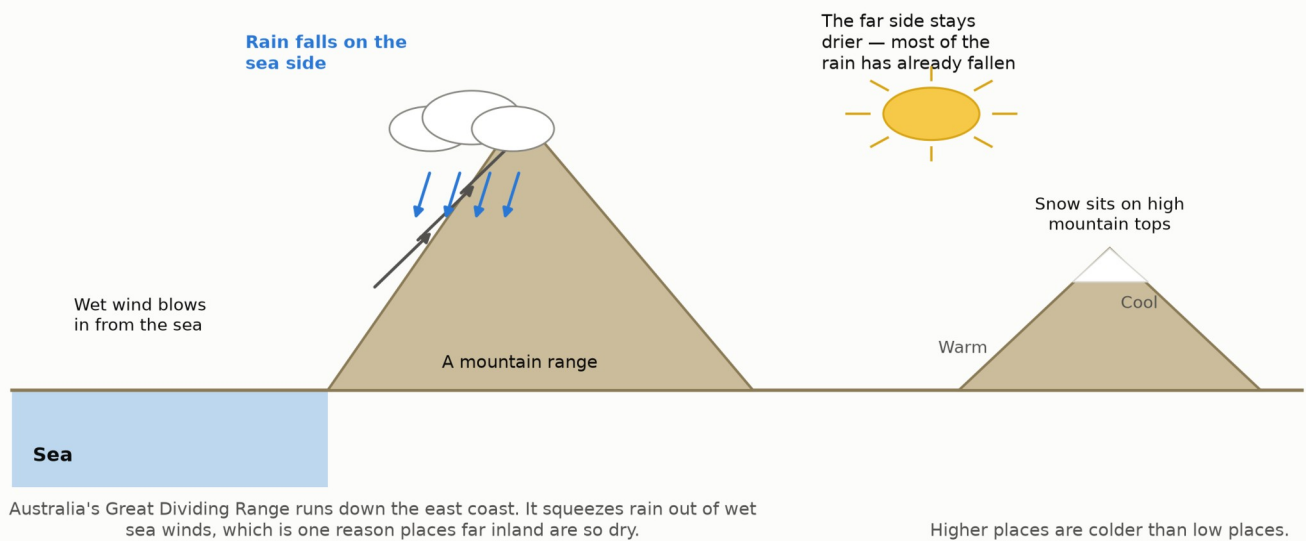
A diagram of the Sun sending three rays in a straight row onto the side of the Earth at the equator, where their warmth is packed into a small yellow patch, and three rays arriving at a slant near the North Pole, where the same warmth is spread over a much longer yellow patch. Callouts say: near the equator the rays arrive straight on so it is hot; near the poles they arrive at a slant so it is colder.

Figure 8. Straight-on rays at the equator pack their warmth into a small patch; slanted rays near the poles spread it thin.

Near the equator the rays land straight on, so their warmth is packed into a small patch: hot. Near the poles the rays land at an angle, so the same warmth is spread over a big patch: cold. That is why climate zones run in bands, and why **latitude** is the biggest boss of climate: the further a place is from the equator, the cooler its climate.

The shape of the land — its **topography** — matters too. **Topography** means where the mountains, hills and valleys are. A **mountain range** is a long line of mountains, like the Great Dividing Range that runs down the east of Australia.

Mountains change the weather coming through



A diagram in two parts. Left: wet wind blows in from the sea and rises over a mountain range; rain falls on the sea side, and the far side stays drier because most of the rain has already fallen. Right: a smaller mountain with snow on top; the low ground is marked Warm and the high ground Cool, because higher places are colder than low places. A note says the Great Dividing Range squeezes rain out of wet sea winds, which is one reason places far inland are so dry.

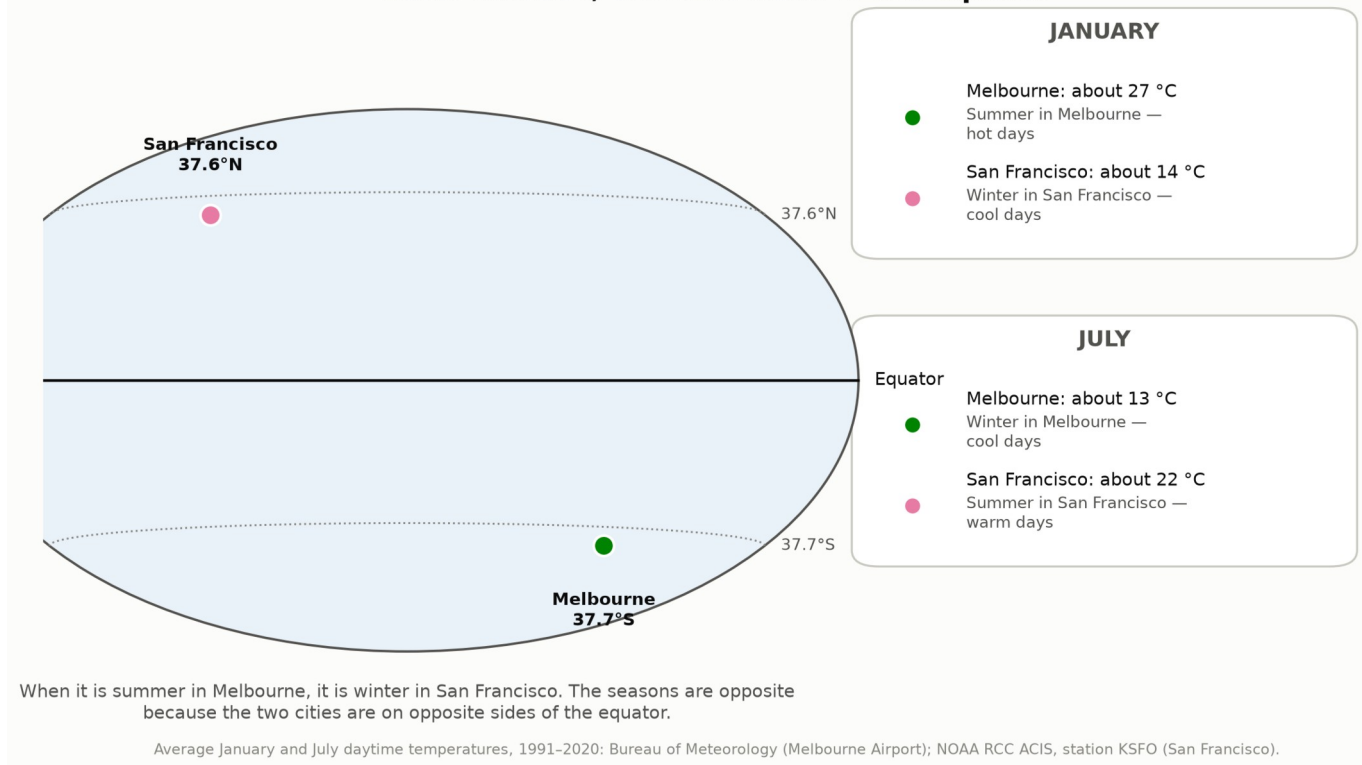
Figure 9. Two ways mountains change climate: they squeeze rain out of wet sea winds, and high places are colder than low places.

When wet wind from the sea hits a mountain range, it is pushed up. Going up, it cools, and its rain falls on the sea side. The far side gets much less rain — which is one reason places far inland of the Great Dividing Range are so dry. Mountains also cool the air: high places are colder than low places, which is why snow can sit on a mountain top in a warm country.

Same latitude, opposite seasons

Here is a puzzle. **Melbourne** sits at 37.7° south of the equator. **San Francisco**, in the United States, sits at 37.6° north. Almost the same latitude — opposite hemispheres.

Same latitude, different sides of the equator



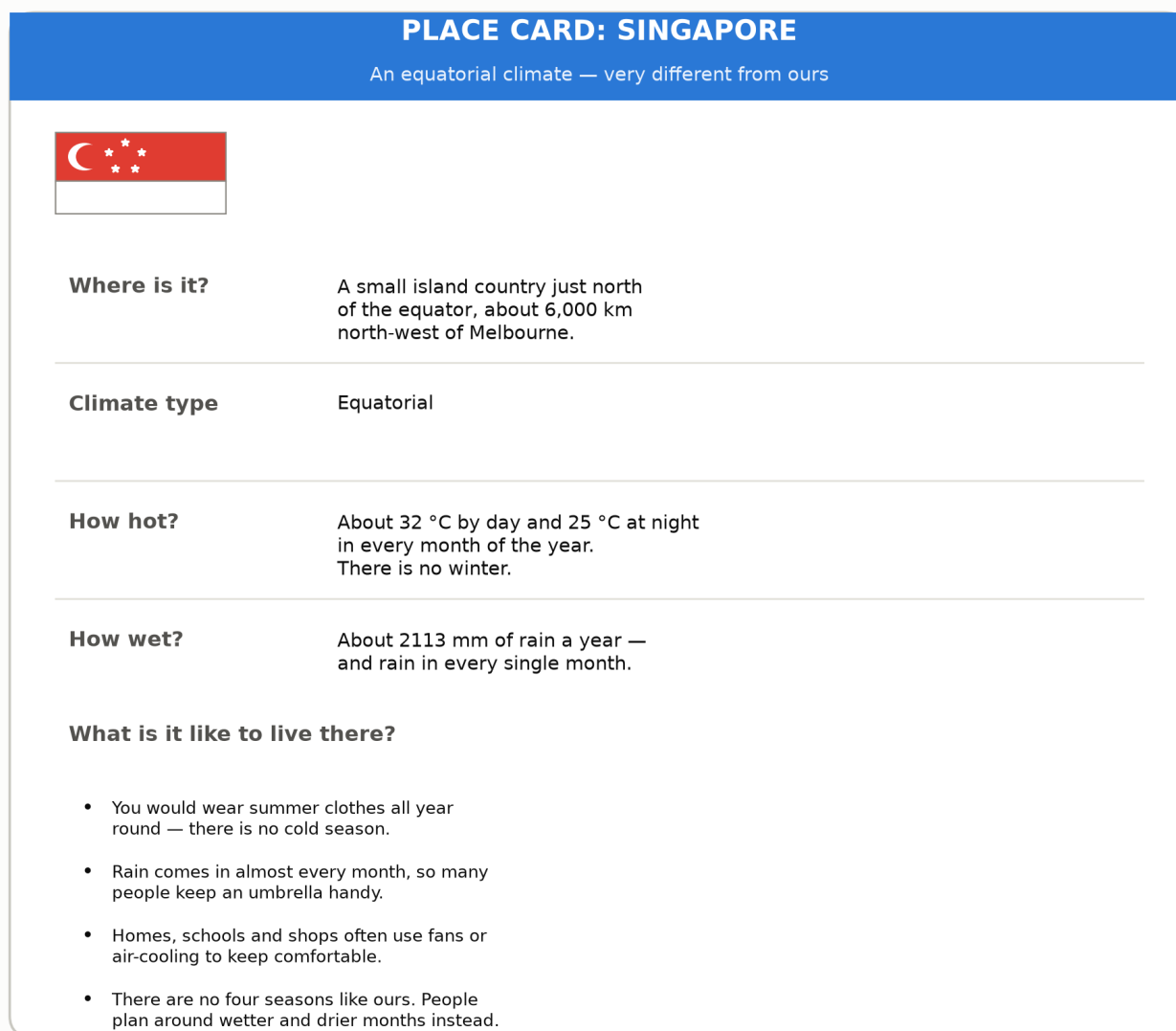
A globe with the equator and two latitude circles marked 37.6 degrees north and 37.7 degrees south, with San Francisco on the northern one and Melbourne on the southern one. Two cards give the real averages: in January Melbourne is about 27 °C (summer, hot days) while San Francisco is about 14 °C (winter, cool days); in July Melbourne is about 13 °C (winter, cool days) while San Francisco is about 22 °C (summer, warm days). A note says the seasons are opposite because the two cities are on opposite sides of the equator.

Figure 10. Same latitude, opposite sides of the equator: when Melbourne has summer, San Francisco has winter.

In January, Melbourne is in summer with hot days around 27 °C — and San Francisco is in winter with cool days around 14 °C. In July it swaps: cool Melbourne, warm San Francisco. The two halves of the Earth have their summers at opposite times of the year, so opposite hemispheres mean opposite seasons. Same latitude does not mean same weather!

A place with a very different climate

Last stop: a place with a climate as different from ours as can be.



Numbers: long-term averages 1991–2020, National Environment Agency, Singapore.

A place card for Singapore with a small red-and-white flag. Where is it? A small island country just north of the equator, about 6,000 km north-west of Melbourne. Climate type: equatorial. How hot? About 32 °C by day and 25 °C at night in every month of the year; there is no winter. How wet? About 2,113 mm of rain a year, with rain in every single month. What is it like to live there? Summer clothes all year round; an umbrella handy in almost every month; fans or air-cooling in many homes and schools; no four seasons like ours, with wetter and drier months instead.

Figure 11. Place card: Singapore, an equatorial climate. Numbers are long-term averages, 1991–2020.

Read the card. Singapore, a small island country about 6,000 km (km is short for kilometres) north-west of Melbourne, sits almost on the equator. It is hot all year — about 32 °C by day, about 25 °C at night — and it rains in nearly every month. There is no winter at all. Think about living there: you would wear summer clothes all year, keep an umbrella handy, and never need a jumper — but you would never see the four seasons change the way they do at home.

We try together

Worked example 1 (VC2HG4K06.E02) — Name the climate type from each climograph in Figure 6.

Working

Note

Darwin: tall rain bars December to March (January about 470 mm), tiny bars June to August (July about 1

Hot all year, with a wet season and a dry season.

Working	Note
mm).	
That matches the tropical pattern.	One type down.
Alice Springs: every bar is short; only about 275 mm of rain in the whole year.	Very little rain, very hot days, cool nights.
That matches the arid pattern.	Two types down.
Melbourne: middle bars in every month; about 515 mm of rain spread across the year.	Warm summers, cool winters, rain in every season.
That matches the temperate pattern.	All three named.

∴ Darwin is tropical, Alice Springs is arid and Melbourne is temperate — the shape of the rain bars gives the type away.

Worked example 2 (VC2HG4K06.E05) — Compare Melbourne with San Francisco, its partner at the same latitude in the other hemisphere.

Working	Note
Melbourne 37.7°S; San Francisco 37.6°N.	Almost the same latitude, opposite sides of the equator.
January: Melbourne about 27 °C days; San Francisco about 14 °C days.	Melbourne summer; San Francisco winter.
July: Melbourne about 13 °C days; San Francisco about 22 °C days.	The seasons swap over.
Why? The two halves of the Earth have their summers at opposite times of the year.	Opposite hemispheres, opposite seasons.

∴ Same latitude, opposite hemispheres: when Melbourne has summer, San Francisco has winter, and the other way round.

Questions to practise

With help

- (Figure 2) Sort these two cards and say how you knew: *Right now it is 28 °C and windy.* and *Most years, Alice Springs is very hot and very dry.*
- (Figure 1) a) Which day from 11 to 24 August was the hottest, and how hot was it? b) Was every day the same as the August average? How can you tell from the lines?
- (Figure 3) Which climate type is hot all year with rain nearly every month? Which two types are the dry desert-country ones?
- (Figure 4) Name the climate type at Perth and at Darwin. Which type in the legend is not found in Australia?
- (Figure 5) Is Singapore north or south of the equator? Which climate zone does it sit in?
- (Figure 8) Where does the sun's warmth get packed into a small patch — near the equator or near the poles? What does that do to the climate there?

On your own

- (Figure 2) Sort the last two cards, *Darwin has a Wet season from about December to March* and *We had a sunny morning and a storm after lunch.* Then write two cards of your own: one weather card and one climate card.
- (Figure 6) About how many mm of rain falls in Darwin in January? Is January in Darwin's wet season or dry season?
- (Figure 7) Give one way Perth's rain pattern is different from Melbourne's.
- (Figures 10 and 9) a) It is January. What season is it in Melbourne, and what season is it in San Francisco? Why do the two cities have opposite seasons? b) Why does the far side of a mountain range get less rain than the sea side?

Places in real life

Here is a real table of weather: the daily highest and lowest temperatures at Melbourne Airport, 11 to 18 August 2026.

Day	Highest (°C)	Lowest (°C)
Tue 11 Aug	12	7
Wed 12 Aug	14	8
Thu 13 Aug	14	8
Fri 14 Aug	16	10
Sat 15 Aug	15	7
Sun 16 Aug	16	6
Mon 17 Aug	16	3
Tue 18 Aug	18	4

- Which day was the hottest? Which night was the coldest?
- The August average high at this station is 14.7 °C. Count the days whose highest temperature was above it.
- Is this table weather or climate? Say why in one sentence.

Now a mini **fieldwork** task — fieldwork means finding things out for yourself, outside. For one week, keep a weather diary for your own town. Each day, write: the sky (sunny, cloudy or rainy), the wind (calm or windy), and how it felt (hot, warm, cool or cold) — or, with a grown-up, look up your town's day on the Bureau of Meteorology website. At the end of the week, write one sentence about the weather of each day, and one sentence about your climate, like *Our winters are usually cool and wet*.

Source: Daily temperatures 11 to 24 August 2026, Melbourne Airport: Bureau of Meteorology observations via the Iowa Environmental Mesonet archive, read 25 August 2026. August average: Bureau of Meteorology 1991–2020 averages.

Answers

1. *Right now it is 28 °C and windy* is weather (right now, one day). *Most years, Alice Springs is very hot and very dry* is climate (the average pattern, most years).
2.
 - a) 18 August, 18 °C. b) No — the day lines jump above and below the flat average lines, so some days were hotter or colder than the August average.
3. Equatorial. The dry ones: arid and semi-arid.
4. Perth: Mediterranean. Darwin: tropical. Not in Australia: equatorial.
5. North of the equator; the hot zone near the equator (equatorial).
6. Near the equator; the climate there is hot.
7. *Darwin has a Wet season...* is climate (the average pattern across years). *We had a sunny morning and a storm after lunch* is weather (one day). Your own cards will be different.
8. About 470 mm; the wet season.
9. Perth gets most of its rain in winter (tall bars June to August, tiny bars in summer); Melbourne gets rain in every month.
10.
 - a) January: summer in Melbourne, winter in San Francisco; the cities are on opposite sides of the equator, so their seasons are opposite. b) The range squeezes the rain out of the wet sea wind on the sea side, so the air crossing over has little rain left for the far side.

Places in real life: a) Hottest day 18 August (18 °C); coldest night 17 August (3 °C). b) 5 days (14, 15, 16, 17 and 18 August: 16, 15, 16, 16, 18 °C, all above 14.7 °C). c) Weather — eight real days, not the long-term average pattern; the climate is the average shown by the flat lines in Figure 1.

All the working

Data and sources (all read 25 August 2026). - Australian stations (Darwin Airport, Alice Springs Airport, Broken Hill Airport, Perth, Melbourne Airport): Bureau of Meteorology 30-year averages as published in the Wikipedia climate tables, which copy the numbers of the Bureau; the Bureau website itself would not open from the writing desk that day. Broken Hill 1957–2023 and Perth 1993–2023 as published; the others 1991–2020. - Daily temperatures 11 to 24 August 2026, Melbourne Airport: Bureau of Meteorology day-by-day readings, kept by the Iowa Environmental Mesonet (IEM); written in °F, turned into °C and rounded (example: 64.4 °F is 18 °C). - San Francisco Airport (station KSFO): averages 1991–2020 worked out from the NOAA RCC ACIS daily record (January about 14.0 °C days, July about 22.0 °C days). - Singapore: National Environment Agency averages 1991–2020 (about 2,113 mm a year; days about 31.6 °C, shown as about 32 °C; nights about 25 °C). - The land shapes in Figures 4 and 5: Natural Earth, free for anyone to use.

Number checks. - Worked example 1: Darwin January 470.7 mm (about 470), July 0.9 mm (about 1); Alice Springs year 274.8 mm (about 275); Melbourne year 515.4 mm (about 515). - Worked example 2: Melbourne January max 27.0 °C, July max 13.4 °C (about 13); San Francisco January about 14 °C, July about 22 °C. - Places in real life b): highs 12, 14, 14, 16, 15, 16, 16, 18 against 14.7 — five days above (16, 15, 16, 16, 18).

Teaching notes. - D12 boundary: climate is taught as what-it-is and where-it-is only. Dangerous weather events (bushfires, floods, long dry spells, cyclones) belong to Levels 5 to 6 and are not taught here; there is no teaching of climate change; the mountain and sun figures use words, not numbers. - D7: the codes E01 to E05 at the top are keys for the record, not the teaching order; the teaching order runs weather to climate, types, maps, climographs, causes, then the two place studies at the end. - The book plan says: no “things you should already know” box; the early-years idea of the four seasons is named again in one sentence in the first part. - Vocabulary: every word above is checked by `src/gate_3b_vocab.py` at a Year 3 ceiling, with the three house free passes: words taken from the code lines at the top, subject words defined when they first appear, and names. Subject words defined in the text: weather, climate, temperature, degrees Celsius, thermometer, climate type, equator, hemisphere, latitude, tropics, poles, bands and zones, climograph, millimetres, weather station, rays, topography, mountain range, fieldwork.

How climate and vegetation interconnect across the world

TEACHER-FACING METADATA – NOT STUDENT TEXT (the vocabulary gate excludes this block)

Section 3C – Chapter 3 – Strand: Geographical Knowledge and Understanding
Sub-strand: Diversity of places and environments
Owns: VC2HG4K07

Draws on (linkage keys per D7, VCAA export order):
VC2HG4K07.E01
VC2HG4K07.E02

Pairing (TOC Chapter 3 note): 3C reads the global climate map against the global vegetation map built in 3A (major vegetation types) and 3B (world climates); names the other influences (soils, drainage, slope, elevation, aspect); explains why temperatures fall as latitude and altitude rise, and what that does to vegetation.
Closes the Knowledge strand; launch point for the Skills chapters.

Exclusions: none of the TOC \$2A exclusions touch VC2HG4K07 – the CD is taught in full through E01 and E02. CONTENT_POLICY Rule 1: no Aboriginal and Torres Strait Islander content in this section.

Source lines for real-world data (D9), all checked 25 August 2026:

- Bureau of Meteorology, Climate statistics for Australian locations: station 031011 Cairns Aero; 014015 Darwin Airport; 015590 Alice Springs Airport; 083023 Mount Beauty; 083014 Hotham Heights (long-term means; page copies in _data/bom/, retrieved 25 August 2026).
- Coastlines on the model world maps: Natural Earth 110m land, public domain.

Model figures (SOURCE_USE Rule 3, D9): all eight 3c_*.png figures are original drawings made for this book; the two world maps are simplified models, labelled on their face as models, drawn over real Natural Earth coastlines.

Volume (TOC calibration): one teaching sequence; two worked examples on real dated BoM data; six with-help and four on-your-own tasks; one teacher-supported source (inquiry) task reading a real BoM dataset. Reading load Yr3.

Teaching sequence

Two things we already know

In 3A we met the great **vegetation** types of the world. Vegetation means the plants that grow in a place. We met **forest** (thick, green, tall trees), **woodland** (trees with open ground between them), **savannah** (grasses with a few trees), **grassland** (grasses, with few or no trees) and **desert** (very dry, with few plants).

In 3B we met **climate**. The climate of a place is its weather counted over many years. It tells us how hot or cold a place usually is, and how wet or dry.

The new big word

This section is about the **interconnection** between climate and vegetation. An interconnection is a link between two things: when one changes, the other changes too. Climate and vegetation are linked like that. The climate of a place helps choose the plants that grow there.

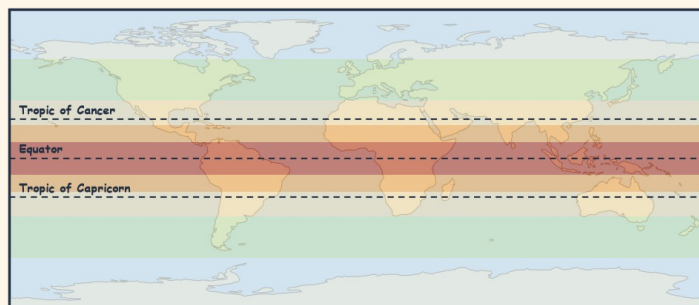
Reading the two maps together

Here are two maps of the world. The left map shows climate. The right map shows vegetation. Look across, band by band.

Two maps of the world, one above the other

Read them together: what grows where the climate is the same?

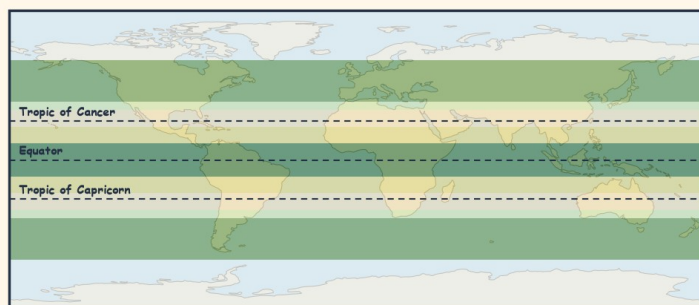
Map 1: world climate zones



- hot and wet all year (equatorial)
- hot, with a wet season and a dry season (tropical)
- hot and dry (arid and semi-arid)
- mild, with rain in all seasons (temperate), or with dry summers (Mediterranean)
- cold all year

Map 2: world vegetation types

Hot and wet all year gives forest. Hot with a dry season gives savannah.
Hot and dry gives desert. Mild with rain all year gives forest and woodland.



- forest (rainforest near the equator)
- savannah: grasses with scattered trees
- desert: very few plants
- grassland: grasses, few trees
- forest and woodland
- very few plants grow (too cold)

A model made for this book. Coastlines: Natural Earth (public domain). The colour bands show the general pattern, not every place.

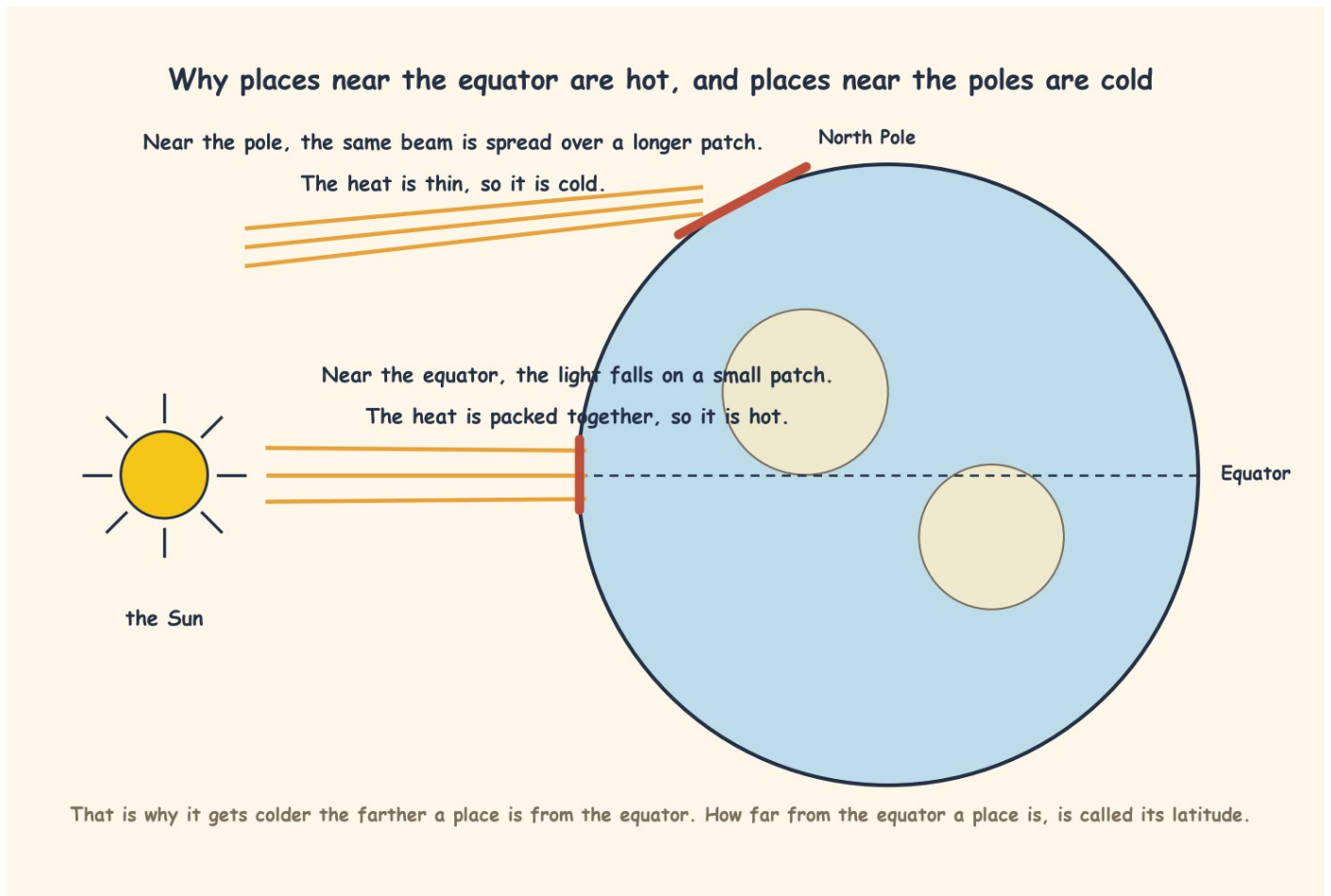
Two world maps side by side. The left map shows climate in colour bands: hot and wet at the equator, then hot and drier bands, mild bands, and cold bands at the poles. The right map shows matching bands of vegetation: thick green forest at the equator, then savannah, desert, grassland, forest and woodland, and bare cold land. Broken lines mark the Equator and the Tropics.

- Where the climate is hot and wet all year, the vegetation is thick green forest.
- Where it is hot with a wet season and a dry season, the vegetation is savannah.
- Where it is hot and dry, the vegetation is desert.
- Where it is dry, but not as dry as desert, the vegetation is grassland.
- Where it is not too hot and not too cold, with rain in most months, the vegetation is forest and woodland.
- Where it is cold all year, very few plants grow.

The bands match. That match is the interconnection between the world's climate and the world's vegetation.

Why is it hot near the equator? (latitude)

The **equator** is a line we imagine around the middle of the Earth, halfway between the poles. How far a place is from the equator is called its **latitude**.



The Sun on the left shining on a round Earth. Near the equator the light falls on a small patch, so the heat is packed together and it is hot. Near the North Pole the same light is spread over a long patch, so the heat is thin and it is cold.

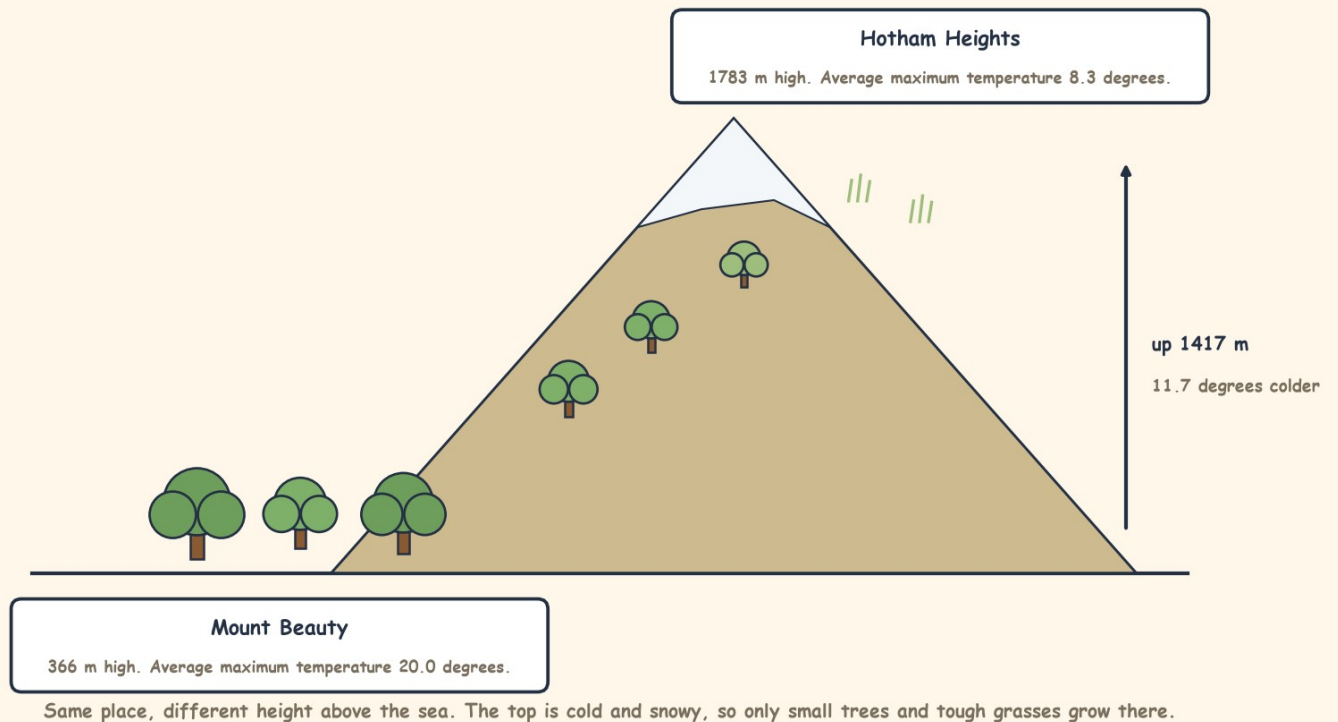
Near the equator, the sun's light falls on a small patch, so the heat is packed together and it is hot. Near the poles, the same light is spread over a long patch, so the heat is thin and it is cold.

So the further a place is from the equator, the colder it gets. That is why hot-loving plants, like rainforest trees, grow near the equator, and why so few plants grow near the poles.

Why is it colder up high? (altitude and elevation)

How high a place is above the sea is called its **altitude**, or **elevation**. The higher you go, the colder it gets. We count heat in **degrees** Celsius: 30 degrees is a hot day, 10 degrees is a cool day, and zero degrees is cold enough for snow.

The higher you go, the colder it gets



A mountain seen from the side. At the bottom is Mount Beauty, 366 m high, with tall trees and an average maximum temperature of 20.0 degrees. At the top is Hotham Heights, 1783 m high, with snow, small trees and grasses, and an average maximum temperature of 8.3 degrees. An arrow marks the climb: up 1417 m and 11.7 degrees colder.

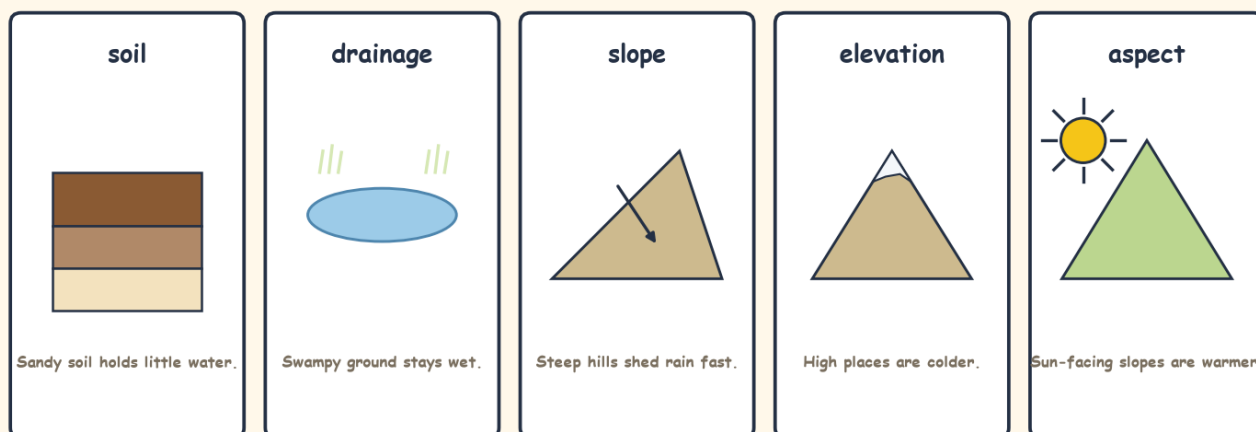
Mount Beauty and Hotham Heights are real places in Victoria, not far from each other. Mount Beauty sits low (366 m) and is warm, with tall forest. Hotham Heights sits high (1783 m) and is much colder — 11.7 degrees colder on **average** (the average is the numbers for many years shared out). Up high it is snowy, and only small trees and tough grasses grow there.

The **average maximum temperature** is the heat of the warmest part of the day, most years.

Climate is the big boss — but five helpers can change the picture

Climate chooses the big pattern. Five more things can change what grows in one small spot: **soil, drainage, slope, elevation** and **aspect**.

Five other things that change what grows in a place



Climate is the biggest boss of what grows in a place. These five can change the picture in small spots.

In Australia, a slope that faces north gets more sun, so it is warmer and drier than the same slope facing south.

Five cards, one for each helper. Soil: layers of ground, sandy soil holds little water. Drainage: a swampy pool, swampy ground stays wet. Slope: a steep hill with an arrow, steep hills shed rain fast. Elevation: a snow-capped mountain, high places are colder. Aspect: a sun shining on one side of a hill, sun-facing slopes are hotter.

- **Soil** is the top layer of the ground that plants grow in. Sandy soil holds little water.
- **Drainage** is how fast water runs away from the ground. In swampy ground, the water stays.
- **Slope** is how steep the ground is. Water runs off a steep hill fast.
- **Elevation** is how high the ground is above the sea. High places are colder.
- **Aspect** is the way a slope faces. In Australia, a slope facing north gets more sun, so it is hotter and drier than the same slope facing south.

Worked examples

Example 1 — with help: three hot places, three different plants

Here is a table of real numbers from the Bureau of Meteorology.

Five real places, five real climates (Bureau of Meteorology)

Place	How far from the equator	Height above the sea	Rain each year	Average max temperature	What grows there
 Cairns, QLD	16.9 S	2 m	2025.5 mm	29.1 degrees	forest (rainforest)
 Darwin, NT	12.4 S	30 m	1736.8 mm	32.1 degrees	savannah and woodland
 Alice Springs, NT	23.8 S	546 m	283.8 mm	28.9 degrees	desert plants
 Mount Beauty, VIC	36.8 S	366 m	1265.6 mm	20.0 degrees	forest
 Hotham Heights, VIC	37.0 S	1783 m	1532.7 mm	8.3 degrees	small trees and grasses

Bureau of Meteorology, Climate statistics for Australian locations, stations 031011, 014015, 015590, 083023, 083014; retrieved 25 August 2026.

Average = the numbers for many years shared out.

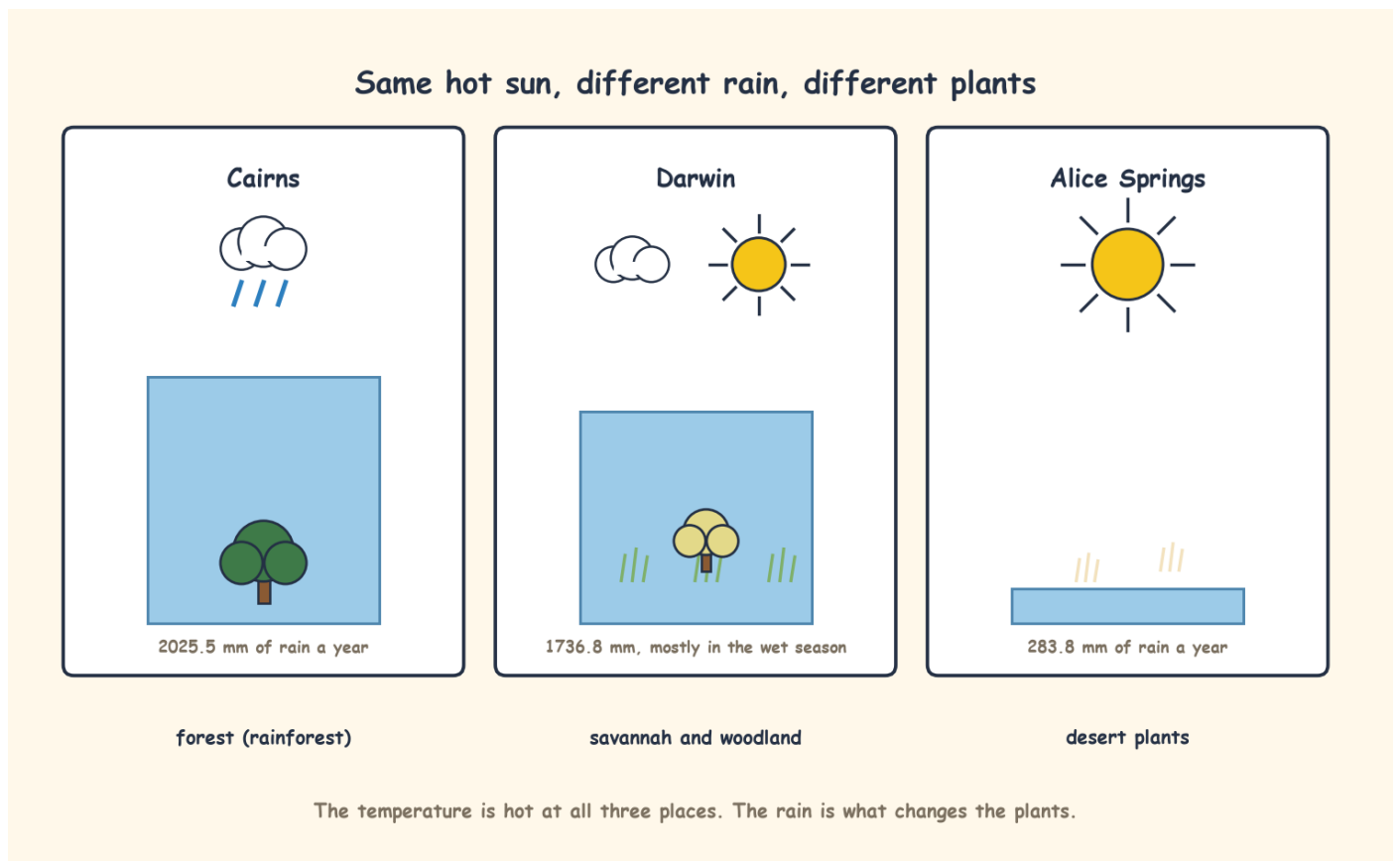
A table of five real Australian places. For each place: how far it is from the equator, its height above the sea, its rain each year, its average maximum temperature, and what grows there. Cairns 2025.5 mm of rain and forest; Darwin 1736.8 mm and savannah and woodland; Alice Springs 283.8 mm and desert plants; Mount Beauty 1265.6 mm and forest; Hotham Heights 1532.7 mm and small trees and grasses.

Step 1 — look at the heat. Cairns 29.1 degrees. Darwin 32.1. Alice Springs 28.9. All three are hot. The heat is much the same.

Step 2 — look at the rain. Cairns 2025.5 mm a year. Darwin 1736.8. Alice Springs only 283.8. The rain is not the same at all.

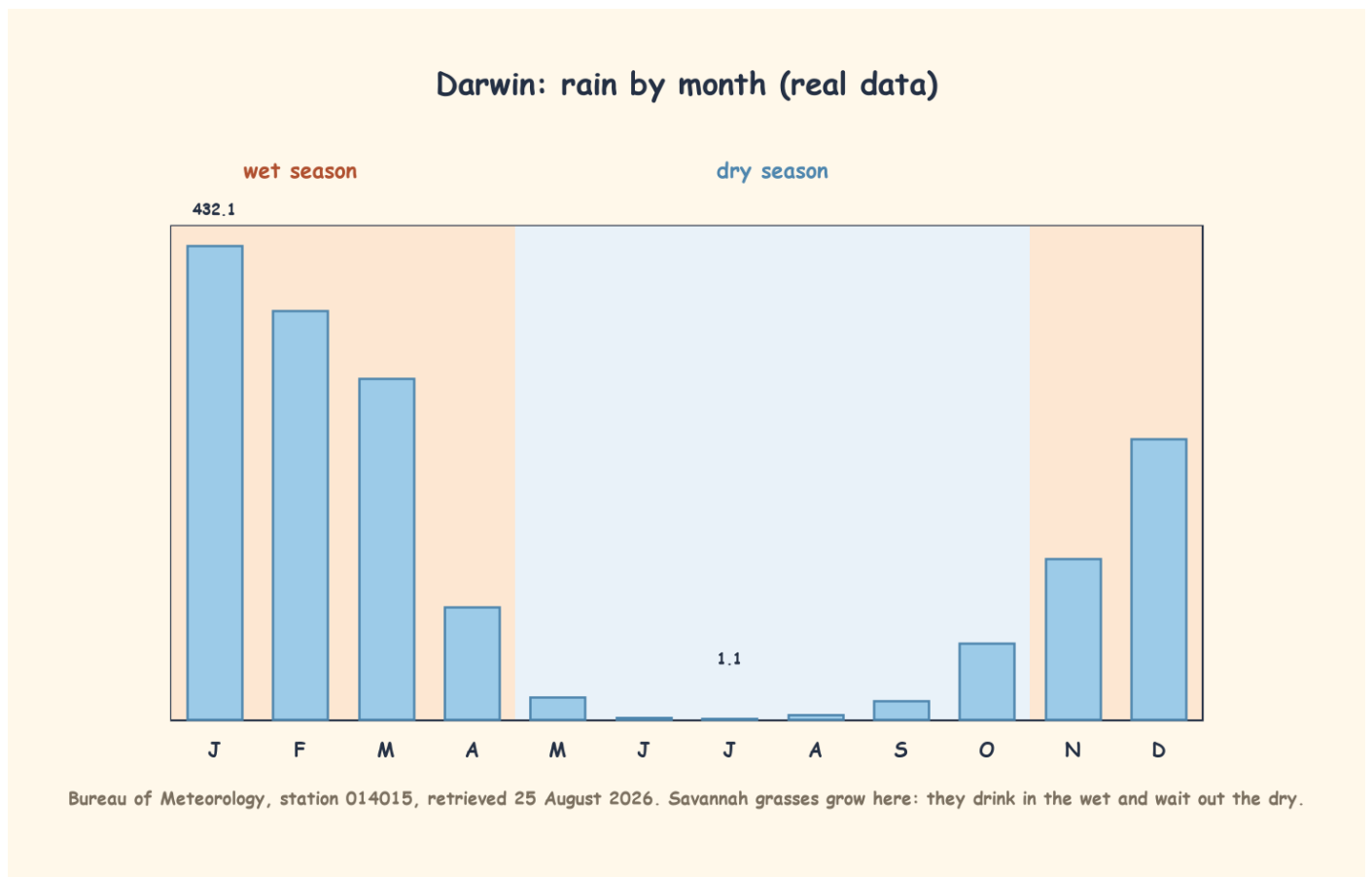
Step 3 — look at the plants. Cairns has rainforest. Darwin has savannah and woodland. Alice Springs has desert plants.

So when the heat is much the same, the rain chooses the plants.



Three cards. Cairns has a rain cloud and a tall water bar, and grows forest. Darwin has a cloud and a sun and a middle water bar, and grows savannah and woodland. Alice Springs has a sun and a short water bar, and grows desert plants.

Darwin's rain by month shows why savannah grows there.



A bar graph of Darwin's rain by month, real data. Tall bars from November to April are the wet season, with 432.1 mm in January. Tiny bars from May to October are the dry season, with 1.1 mm in July.

From November to April the rain pours down. From May to October there is almost no rain. Savannah grasses drink in the wet and wait out the dry.

Example 2 — with help: one mountain, two climates

Step 1 — find the two places. Mount Beauty and Hotham Heights, both in Victoria, in the last two rows of the table.

Step 2 — how far from the equator? 36.8 and 37.0. Almost the same. So latitude is not the reason one place is colder.

Step 3 — how high? 366 m and 1783 m. Hotham Heights is 1417 m higher.

Step 4 — the heat. 20.0 degrees against 8.3. The high place is 11.7 degrees colder.

Step 5 — the plants. Forest at the bottom. Small trees and grasses at the top.

Higher means colder, and colder means different plants. Altitude changes the climate, and the climate changes the vegetation. That chain is interconnection.

Practice tasks

With help

Q1. Look at the two world maps. (a) What vegetation matches the hot-and-wet-all-year climate? (b) What vegetation matches the cold-all-year climate? (c) Which broken line runs through the middle of the hot wet band?

Q2. Look at the sun figure. (a) Where is the heat packed together — near the equator or near the pole? (b) Where is the heat thin? (c) So which is hotter: a place near the equator, or a place near the pole?

Q3. Look at the mountain figure. (a) Which place is higher — Mount Beauty or Hotham Heights? (b) How many degrees colder is the high place? (c) Where are the trees taller — at the bottom, or up high?

Q4. Draw lines on the matching board to join each climate to the vegetation it grows.

Match each climate to the vegetation it grows

Draw a line from each card on the left to its partner on the right.

hot and wet all year	forest and woodland
hot, with a wet season and a dry season	desert: very few, spread-out plants
hot and dry	grassland: grasses with few or no trees
dry, but not as dry as desert	forest: thick, green, tall trees
mild, with rain in most months	almost no plants at all
cold all year	savannah: grasses with a few trees

A matching board. On the left, six climate cards: hot and wet all year; hot with a wet season and a dry season; hot and dry; dry but not as dry as desert; not too hot and not too cold with rain in most months; cold all year. On the right, six vegetation cards in a different order, to join with lines.

Q5. Name the helper: soil, drainage, slope, elevation or aspect. (a) sandy ground that holds little water (b) the way a slope faces the sun (c) ground where the water stays and makes a swamp (d) how steep a hill is (e) how high a place is above the sea

Q6. Finish the sentences. (a) The further a place is from the equator, the _____ it gets. (b) The higher you climb, the _____ it gets. (c) Hot and wet all year grows _____. (d) Hot and dry grows _____ plants.

On your own

Q7. Cairns and Alice Springs are both hot, but their plants are not the same at all. Use the rain numbers from the table to say why.

Q8. Mount Beauty and Hotham Heights are almost side by side, yet one is 11.7 degrees colder. Say why, and say what grows at each place.

Q9. A hill near your town has two sides: one faces north and one faces south. In Australia, which side gets more sun? Which side is hotter and drier? Which side might carry drier plants?

Q10. Pick one band on the climate map. Tell a partner the climate of that band, the vegetation that matches it, and why the two go together.

Source task

Your teacher will help with this one.

The table of five places is real data from the Bureau of Meteorology. Your teacher will read the small print under the table with you.

- (a) Which place gets the most rain each year?
 - (b) Which place is the highest above the sea?
 - (c) Which place has the lowest average maximum temperature?
 - (d) Which two places are in Victoria?
 - (e) Make up your own question about the table that a friend can answer.
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Answers

Q1. (a) Thick green forest (rainforest). (b) Very few plants. (c) The Equator.

Q2. (a) Near the equator. (b) Near the pole. (c) The place near the equator.

Q3. (a) Hotham Heights. (b) 11.7 degrees. (c) At the bottom, at Mount Beauty.

Q4. Hot and wet all year — forest: thick, green, tall trees. Hot with a wet season and a dry season — savannah: grasses with a few trees. Hot and dry — desert: very few, spread-out plants. Dry but not as dry as desert — grassland. Not too hot and not too cold, with rain in most months — forest and woodland. Cold all year — almost no plants at all.

Q5. (a) soil (b) aspect (c) drainage (d) slope (e) elevation.

Q6. (a) colder (b) colder (c) forest (d) desert.

Q7–Q10. See the example answers below.

Source task. (a) Cairns, with 2025.5 mm. (b) Hotham Heights, at 1783 m. (c) Hotham Heights, at 8.3 degrees. (d) Mount Beauty and Hotham Heights. (e) Any question the table can answer, for example: which place gets the least rain?

Example answers

Q7. “Cairns and Alice Springs are both hot, but Cairns gets 2025.5 mm of rain a year and Alice Springs gets only 283.8 mm. Plants need water, so the wet place grows rainforest and the dry place grows desert plants. The rain is the difference.”

Q8. “The two places are almost the same distance from the equator, so latitude is not the reason. Hotham Heights is 1783 m high and Mount Beauty is only 366 m. The higher place is colder — 11.7 degrees colder on average — so Mount Beauty has tall forest and Hotham Heights has small trees and tough grasses.”

Q9. “In Australia, the north side of the hill gets more sun, so it is hotter and drier. The south side is cooler and wetter. The north side might carry drier plants, like grasses, and the south side might carry more trees.”

Q10. “I picked the band at the equator. The climate is hot and wet all year. The vegetation is thick green forest. They go together because the trees need lots of rain and heat, and that band gives both all year.”

Where we found these facts

Geographers — people who study places and the Earth — always say where they found things out. So do we.

- Climate numbers for Cairns (station 031011), Darwin (014015), Alice Springs (015590), Mount Beauty (083023) and Hotham Heights (083014): Bureau of Meteorology, *Climate statistics for Australian locations*.
- The shapes of the land on our two world maps: Natural Earth, free for anyone to use.
- The colour bands on the two world maps are a model made for this book. The real world is not in straight bands like that, but the big pattern is true.

All checked on 25 August 2026.