

Oceania and Hazards

Where Oceania is, climate graphs, moving plates, and living with danger

This is where the six mark question usually lives.

This belongs to **Henry**.

1. All Around Us

2. Oceania and Hazards

3. Fieldwork

The big idea of this booklet

Where a place sits on the Earth explains its weather and its hazards.
The moving plates are the engine behind it all.

How to use this booklet

Read this once. Same shape as booklet 1.

- Each topic starts with **the big question**, then **the idea**, then pictures and key words.
- Then questions that get harder: quick check, then explain, then data, then the six mark question.
- Do one page at a time. Nothing is timed. Reading the example answers is part of the work.

The kinds of question in this booklet

Quick check

Short recall. Answers at the back.

Explain why

Reasons, using P E E (see booklet 1).

Data

Reading a climate graph.

Six marks

The big one. There is a page on how to answer it.

The things to know cold

Nail these and the whole booklet gets easier.

The three plate boundaries

Plates moving **apart**, plates moving **together**, and plates **sliding past** each other.

What causes a tsunami

An **underwater earthquake** that pushes a huge amount of water.

The Ring of Fire

A ring around the Pacific Ocean with most of the world's earthquakes and volcanoes. Oceania sits on it.

The three Ps

Prediction, Protection, Preparation. The three ways to manage a hazard.

Climate is not weather

Weather is day to day. **Climate** is the usual weather over many years.

How to answer the six mark question

This question is worth the most. A few minutes of thinking first pays off.

1

Point

Make a clear point.

2

Develop

Add a detail, fact or example.

3

Link

Say why it matters, or what it leads to.

Do that **two or three times**, with a different point each time.

Two rules that lift the marks

- If the question names parts, like causes, impacts and responses, write a bit on **each part**.
- Use linking words: *this means, as a result, for example, this is important because.*

Finish strongly

End with one sentence that answers the question directly. It pulls the whole answer together.

Locating Oceania

The big question: Where is Oceania, and which countries are in it?

The idea

Oceania is a region in and around the Pacific Ocean.

It is mostly south of the Equator, on the far side of the world from the UK.

It is made up of Australia, New Zealand, and many smaller island nations.

Five countries to know

Australia, New Zealand, Papua New Guinea, Fiji, Samoa.

Finding it with latitude and longitude

Oceania sits mostly **south** of the Equator (so southern latitudes) and far to the **east** on the longitude lines. Australia is at roughly 25 degrees south, 133 degrees east.

Watch out

Oceania is a region, not a single country. Australia is one country inside it, not the whole thing.

Locating Oceania: your turn

QUICK CHECK

1. Which ocean is Oceania in and around?

2. Name five countries in Oceania.

3. Is Oceania mostly north or south of the Equator?

4. Is Oceania a country or a region? Explain in one line.

Climate and climate graphs

The big question: What does a climate graph show, and how do you read one?

Climate is not the same as weather

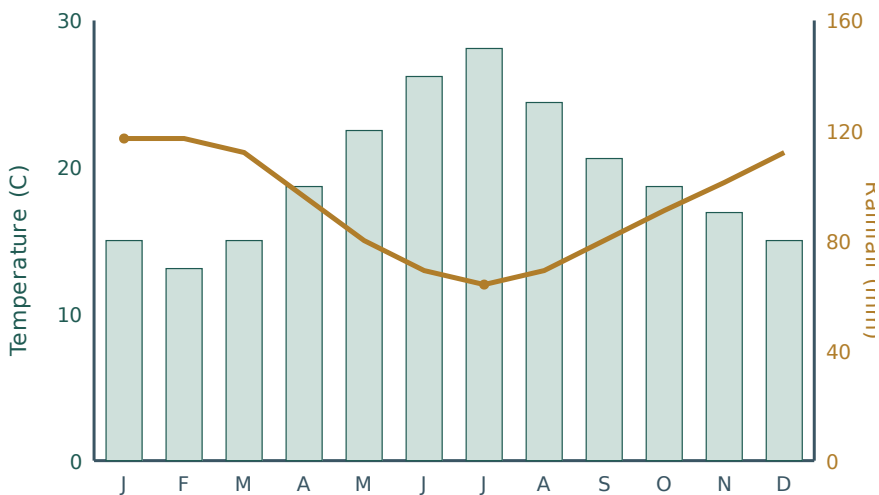
Weather is what it is doing today. Sunny, raining, windy.

Climate is the usual pattern over many years. It is the bigger picture.

How to read a climate graph

A climate graph shows two things at once, across the twelve months.

- The **bars** show rainfall. Read them against the scale on the **right**.
- The **line** shows temperature. Read it against the scale on the **left**.



A climate graph for a place in the southern half of the world. Bars are rainfall. The line is temperature.

Watch out

There are two scales, one on each side. Read the line on the left and the bars on the right. Mixing them up is the usual mistake.

Climate graphs: your turn

Use the climate graph on the page before this one.

DATA

1. Which month has the most rainfall? Roughly how much?

2. Which two months are the warmest?

3. Which month is the coldest, and what is the temperature then?

4. Work out the temperature range (warmest minus coldest).

EXPLAIN WHY

This place is warmest in December and January and coolest in June and July. Explain what this tells you about where it is.

EXAMPLE ANSWER

Point. It tells you the place is in the southern half of the world.

Evidence. It is warmest in December and January, when the UK is cold.

Explain. This matters because the seasons are flipped south of the Equator, so summer there falls in our winter months. That fits with Oceania.

Tectonics: the engine

The big question: Why do earthquakes, volcanoes and tsunamis happen where they do?

The idea

The outer shell of the Earth is not one solid piece.

It is cracked into huge slabs called **plates**.

These plates float on hot, soft rock below, and they slowly move.

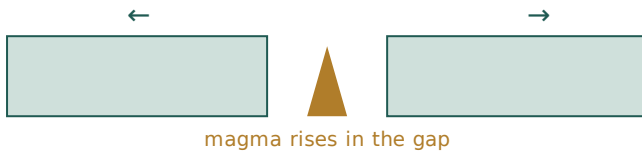
Where two plates meet is called a **boundary**. That is where the action happens.

The big link to remember

Earthquakes, volcanoes and tsunamis are not random. They mostly happen at plate boundaries. So if you know where the plates meet, you can predict where the hazards are.

The three plate boundaries

1. Plates moving apart



The plates pull apart. Magma rises into the gap and makes new land. This causes gentle volcanoes and mild earthquakes.

2. Plates moving together



The plates push together. The heavier one slides underneath and melts. This causes powerful volcanoes and strong earthquakes.

3. Plates sliding past each other



The plates scrape past each other in opposite directions. No volcano, but they can stick and then jolt, which causes strong earthquakes. This is the kind of movement that hit Christchurch.

Volcanoes, earthquakes and tsunamis

Volcano

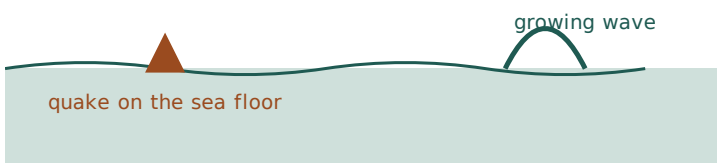
An opening in the Earth's surface where magma reaches the top. When it erupts, lava, ash and gas come out.

Earthquake

A sudden shaking of the ground. It happens when stuck plates finally jolt and release a burst of energy. The shaking is strongest near the centre.

Tsunami

A series of huge waves. It usually starts with an **underwater earthquake**, which pushes a massive amount of water. The waves grow tall as they reach the shore.



An earthquake under the sea pushes the water, and the wave grows as it nears land.

Watch out

A tsunami is not caused by wind or by the weather. It is caused by the sea floor moving, usually in an earthquake.

Tectonics: your turn

QUICK CHECK

1. What are the huge slabs that make up the Earth's outer shell called?

2. Name the three types of plate boundary.

3. Which boundary makes new land as plates pull apart?

4. What causes a tsunami?

EXPLAIN WHY

Explain why earthquakes and volcanoes happen in some parts of the world far more than others.

EXAMPLE ANSWER

Point. They happen mostly where two plates meet.

Evidence. At plate boundaries the plates push, pull or scrape against each other.

Explain. This matters because that movement releases energy and lets magma rise, so the hazards are clustered along the boundaries and rare in the middle of a plate.

Natural hazards

The big question: What kinds of natural hazard are there, and why does Oceania get so many?

Two families of hazard

Geophysical

From inside the Earth. Earthquakes, volcanoes, tsunamis.

Climatic

From the weather and climate. Tropical storms, floods, droughts.

Why Oceania gets so many

Much of Oceania sits on the **Ring of Fire**.

This is a ring of plate boundaries around the Pacific Ocean.

Most of the world's earthquakes and volcanoes happen along it.

So countries like New Zealand get many geophysical hazards. Pacific islands also get climatic hazards like tropical storms.

Watch out

A natural event only becomes a hazard when it can harm people. An earthquake in an empty desert is an event. The same earthquake under a city is a hazard.

Natural hazards: your turn

QUICK CHECK

1. What is a geophysical hazard? Give one example.

2. What is a climatic hazard? Give one example.

3. What is the Ring of Fire?

4. Why does New Zealand get many earthquakes?

Case study: the New Zealand earthquake, 2011

The big question: What caused the Christchurch earthquake, what did it do, and how did people respond?

The basics

- It struck Christchurch, New Zealand, on 22 February 2011.
- It measured 6.3 in strength.
- It was **shallow** and very **close to the city**, which made the shaking severe.

Causes

- New Zealand sits on a boundary between two plates.
- The plates jolted along a fault.
- It was shallow and near the city, so the shaking was strong.

Impacts

- 185 people died and many were injured.
- Buildings collapsed, including the cathedral.
- Soft, wet ground gave way under buildings.
- Water, power and roads were cut off. The cost was huge.

Responses

- Rescue teams searched for survivors, some from abroad.
- Aid groups gave shelter, food and water.
- Water and power were repaired.
- The city was rebuilt with stronger building rules.

Watch out

A bigger number does not always mean more damage. This quake was only 6.3, but it was shallow and right under a city, which is why it was so destructive.

Christchurch: your turn

QUICK CHECK

1. In which year and country did this earthquake happen?

2. Give one cause of the earthquake.

3. Give two impacts.

4. Give two ways people responded.

SIX MARKS

Describe the impacts of the Christchurch earthquake, and how people responded. [6 marks]

Living with hazards

The big question: Why do people live in dangerous places, and how do they stay safer?

Why people live in tectonic areas

- **Rich soil.** Volcanic ash makes very fertile soil, which is good for farming.
- **Energy.** Hot rocks underground can be used to make electricity and heat homes.
- **Jobs and tourism.** Volcanoes, hot springs and scenery bring visitors and work.
- **It is home.** Family, friends and work are there. Many cannot afford to move, and big events are rare in a lifetime.

The three Ps: how to manage a hazard

Prediction

Trying to know when and where it will happen. Monitoring volcanoes, and tsunami warning systems.

Protection

Reducing the damage. Strong buildings, sea walls, and building rules.

Preparation

Getting ready. Practice drills, emergency kits, and clear plans.

Watch out

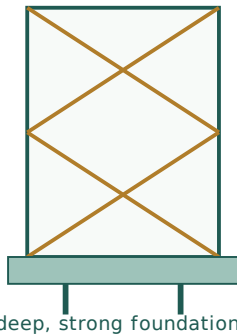
Earthquakes are very hard to predict exactly. So protection and preparation matter most for them. Volcanoes are easier to predict, because the ground often gives warning signs.

Earthquake resistant buildings

The idea

You cannot stop an earthquake. But you can build so that buildings bend and survive instead of falling.

cross bracing holds the frame



A flexible frame, cross bracing, and deep foundations help a building survive shaking.

- **Deep, strong foundations** hold the building steady, sometimes on rubber pads that absorb the shaking.
- **Cross bracing**, the steel X shapes, stops the frame twisting.
- **A flexible steel frame** sways with the shaking instead of snapping.
- **An automatic gas shut off** stops fires starting.

Living with hazards: your turn

QUICK CHECK

1. What do the three Ps stand for?

2. Give two reasons people live in tectonic areas.

3. Name one feature of an earthquake resistant building, and say what it does.

SIX MARKS

Explain why many people choose to live in areas at risk from earthquakes and volcanoes. **[6 marks]**

EXAMPLE ANSWER

One reason is farming. Volcanic ash breaks down into very rich soil, which means crops grow well, so farmers can make a good living there. Another reason is energy and money. The hot rocks underground can be used to make electricity, and volcanoes and hot springs bring tourists, which creates jobs.

There are also personal reasons. For many people it is simply home, where their family, friends and work are, and they may not be able to afford to move. As well as this, big eruptions and earthquakes can be rare in a lifetime, so people decide the benefits are worth the risk. Overall, people stay because the land and the work it offers matter more to them day to day than a danger that may never come.

Now try your own answer.

How this booklet links up

The whole booklet is really one chain. If you can talk through this chain, you can answer almost any hazard question.

Moving plates. The Earth's shell is cracked into plates that move.



Boundaries. Where plates meet, they push, pull or scrape.



Hazards. That movement causes earthquakes, volcanoes and tsunamis.



Christchurch, 2011. A real example of plates jolting under a city.



Living with it. People still live there for good reasons, and use the three Ps to stay safer.

And remember the link back to booklet 1: **where a place is** explains all of this. Oceania sits on the Ring of Fire, which is why it gets so many hazards.

What to revise first

Protect these. The six mark question almost always comes from this booklet.

1 The tectonics chain and the three Ps

The likely six mark question. Plates, boundaries, hazards, then managing them.

2 The Christchurch case study

One cause, two impacts, two responses. Ready to use in the six mark answer.

3 Reading a climate graph

Quick, reliable data marks.

4 Locating Oceania and its five countries

Recall marks.

The must know floor for this booklet

- The three plate boundaries and what each one causes.
- What causes a tsunami.
- The three Ps, and two reasons people live in tectonic areas.
- Read a climate graph: wettest month, warmest month, temperature range.
- A few Christchurch facts: one cause, two impacts, two responses.
- Five Oceania countries, and that Oceania is south of the Equator.

Answers to the quick check and data questions

For the short questions only. The explain and six mark questions have examples next to them.

Topic 1: Locating Oceania

1. The Pacific Ocean.
2. Australia, New Zealand, Papua New Guinea, Fiji, Samoa.
3. South of the Equator.
4. A region. It is a group of countries, not a single country.

Topic 2: Climate graphs

1. July, about 150 mm.
2. December and January.
3. July, about 12 degrees.
4. About 22 minus 12, which is 10 degrees.

Topic 3: Tectonics

1. Plates.
2. Plates moving apart, plates moving together, and plates sliding past each other.
3. The boundary where plates move apart.
4. An underwater earthquake that pushes a large amount of water.

Topic 4: Natural hazards

1. A hazard from inside the Earth. Any one of: earthquake, volcano, tsunami.
2. A hazard from the weather or climate. Any one of: tropical storm, flood, drought.
3. A ring of plate boundaries around the Pacific Ocean, with most of the world's earthquakes and volcanoes.

4. Because it sits on a plate boundary, on the Ring of Fire.

Topic 5: Christchurch 2011

1. 2011, in New Zealand.
2. The plates jolted along a fault, and it was shallow and close to the city.
3. Any two of: 185 people died, buildings collapsed, the ground gave way, water and power were cut off.
4. Any two of: rescue teams searched for survivors, aid groups gave shelter and water, services were repaired, the city was rebuilt with stronger rules.

Topic 6: Living with hazards

1. Prediction, Protection, Preparation.
2. Any two of: rich volcanic soil for farming, energy from hot rocks, jobs and tourism, it is home.
3. Any one of: deep foundations (hold it steady), cross bracing (stops it twisting), flexible frame (sways instead of snapping).