

My Region and Campania

What is plate tectonics?



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How do earthquakes and volcanic eruptions happen?



Key question we will answer:

What is plate tectonics?

Key geographical knowledge we will use: Physical Geography

Key geographical concepts we will use: Physical Processes

Key question we will answer:

What are earthquakes, and how do they occur?

Key geographical knowledge we will use: Physical Geography

Key geographical concepts we will use: Physical Processes and Locational Knowledge

Key question we will answer:

What are volcanoes, and how do they occur?

Key geographical knowledge we will use: Physical Geography

Key geographical concepts we will use: Physical Processes and Locational Knowledge



Key vocabulary for this lesson:

atlas

– a collection of maps in book form

continents

– any of the world's main continuous expanses of land (Europe, Asia, Africa, North and South America, Oceania, Antarctica)

continental drift

– the drifting movement of continents due to plates of moving rock

map

– a diagram showing where places are located and their features

region

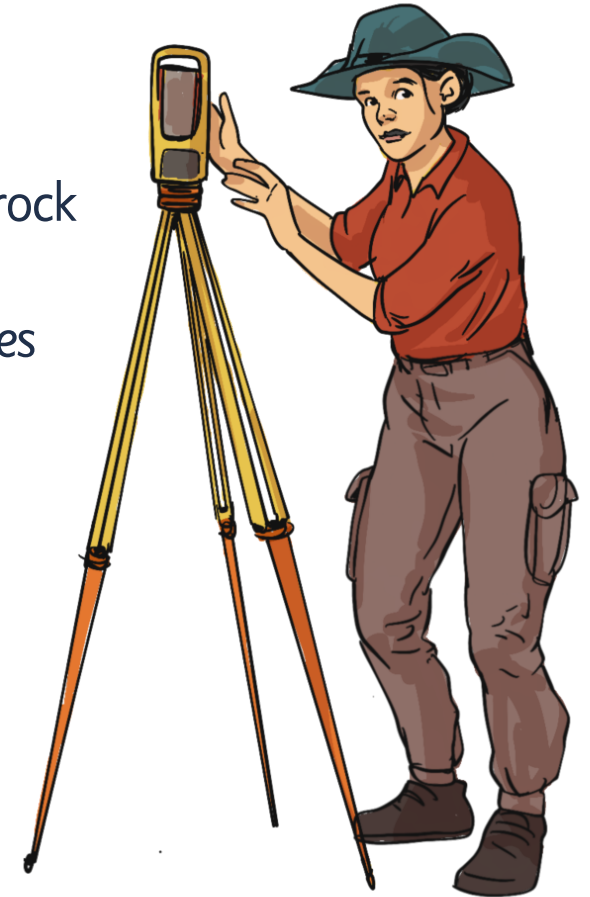
– a named area within a country

sedimentary

– rocks that are formed from small pieces of rocks near the Earth's surface

tectonic plates

– sections of the Earth's crust



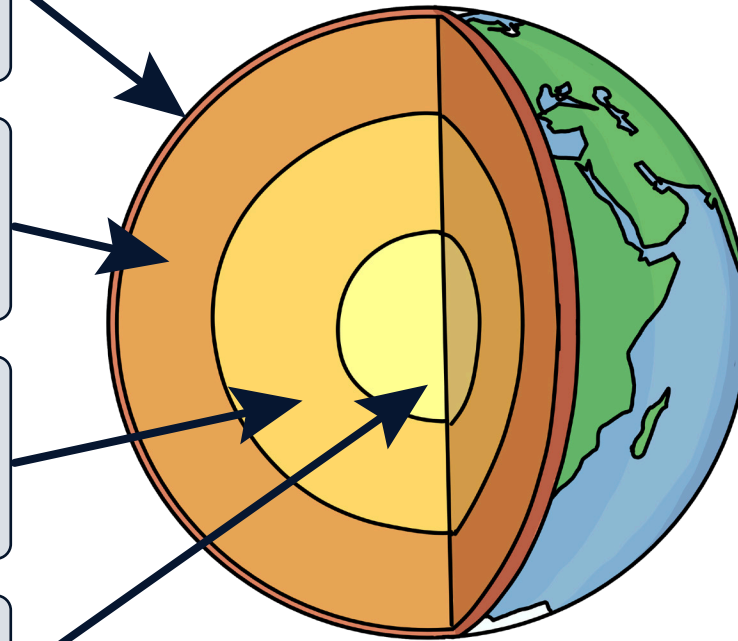
What is plate tectonics?

The **crust** is a **thin layer** at the top, 10 - 100km thick.

The **mantle** has the **properties of a solid**, but it can also flow.

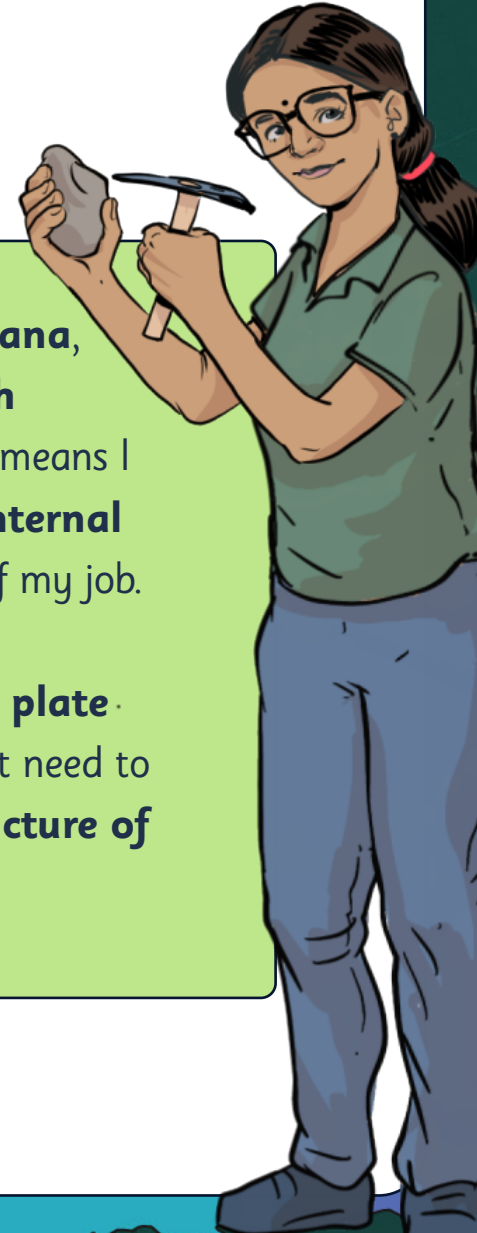
The **core** is made of **molten nickel and iron**. The **outer part** is **liquid**.

The **inner part** of the **core** is **solid**.



Hi! My name is **Silvana**, and I am a **research seismologist**. This means I study the **Earth's internal structure** as part of my job.

To understand what **plate tectonics** is, we first need to understand the **structure of the Earth**.

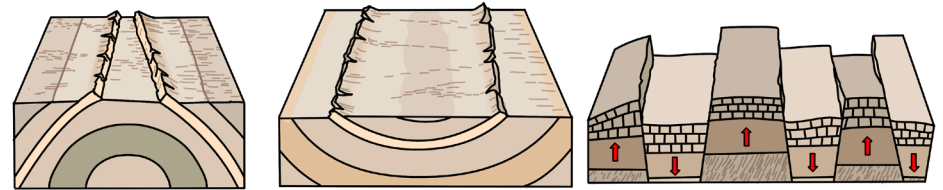


The Earth's crust

The Earth's crust is composed of many different sections called **tectonic plates**.



Scientists can examine **layers of sedimentary rock** to discover how they were formed. They are often found folded or fractured:



Hi, I'm **Lance**.

Why might the layers be found **folded** or **fractured**? **What do you think?**

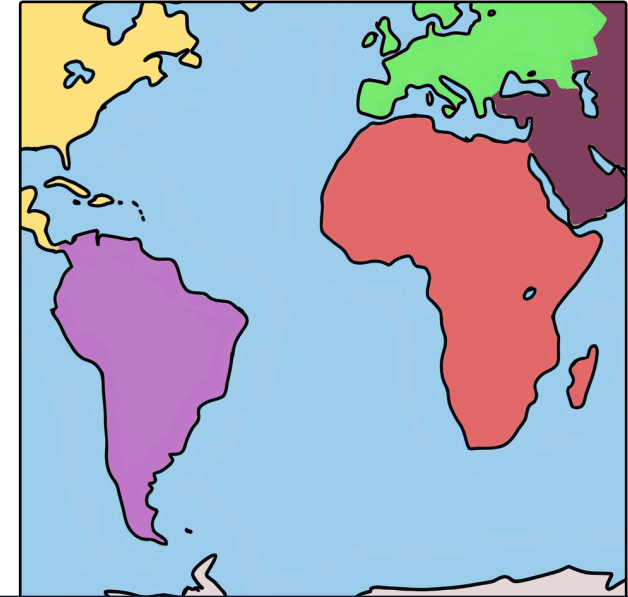
With your learning partner, **discuss** these questions and be ready to **share your feedback** with the class.



The idea of tectonics

People once thought that the oceans and the continents were formed when the **Earth cooled down** after being formed.

Alfred Wegener proposed something different. Consider Africa and South America:



These continents look like they “**fit**” **together**. They also have **similar rock patterns** and **fossil records**. These two pieces of evidence led me to believe there was once a **single land mass**. This is my **TECTONIC THEORY**.



Stop and jot 1

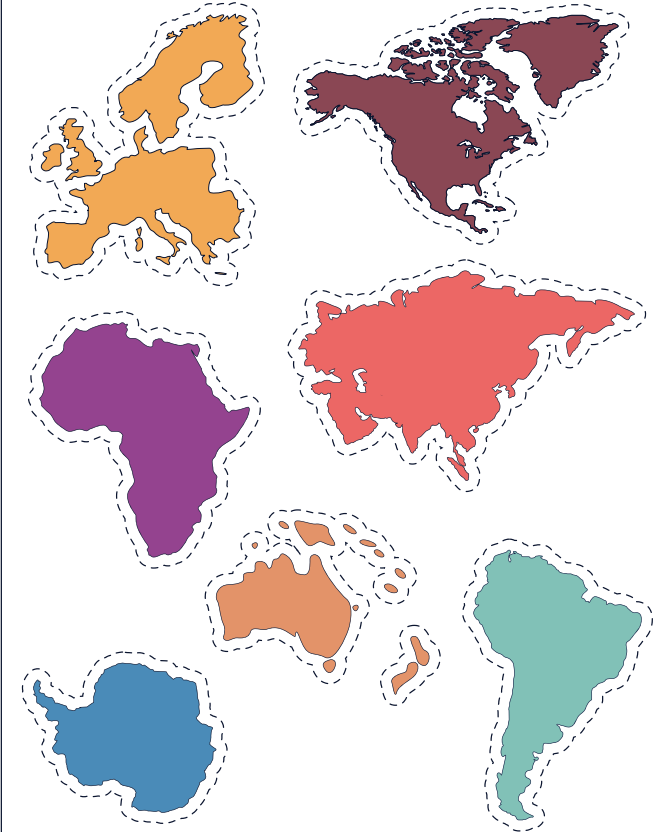


Use the **images of continents** provided on your **stop and jot 1** worksheet to see if you can fit them together.

What might the Earth have looked like **millions of years ago** if Alfred Wegener was right?

Stop and jot 1

Can you **cut** out the **continents** and **put** them **together** as they might have been millions of years ago?



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Continental Drift

Alfred Wegener believed the continents and ocean floors “float” on moving rock plates and have been drifting for **millions of years**.

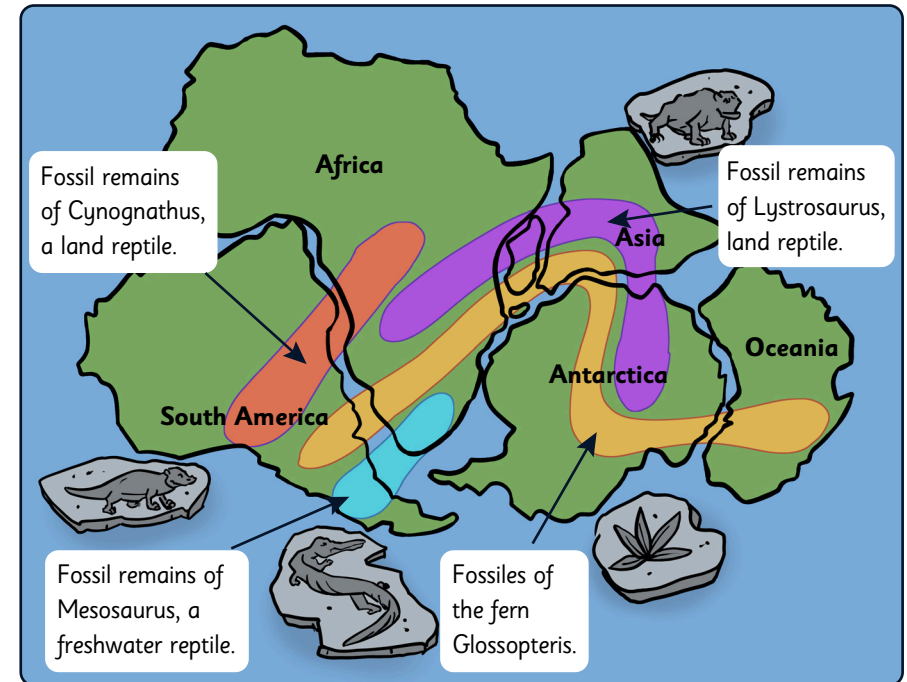
He looked at where different fossils were found and could piece the continents together into one land mass.

The Evidence:

1. Some continents look like they used to “fit” together.
2. Similar rock patterns and fossil records.

The Answer:

1. Scientists discovered 50 years later that the Earth generates massive amounts of heat through radioactive decay in the core. This heat generates convection currents in the mantle, causing the crust to move.
2. We also know that the sea floor spreads outwards from plate boundaries.



Conclusion:

Scientists now believe in Wegener's tectonic theory.

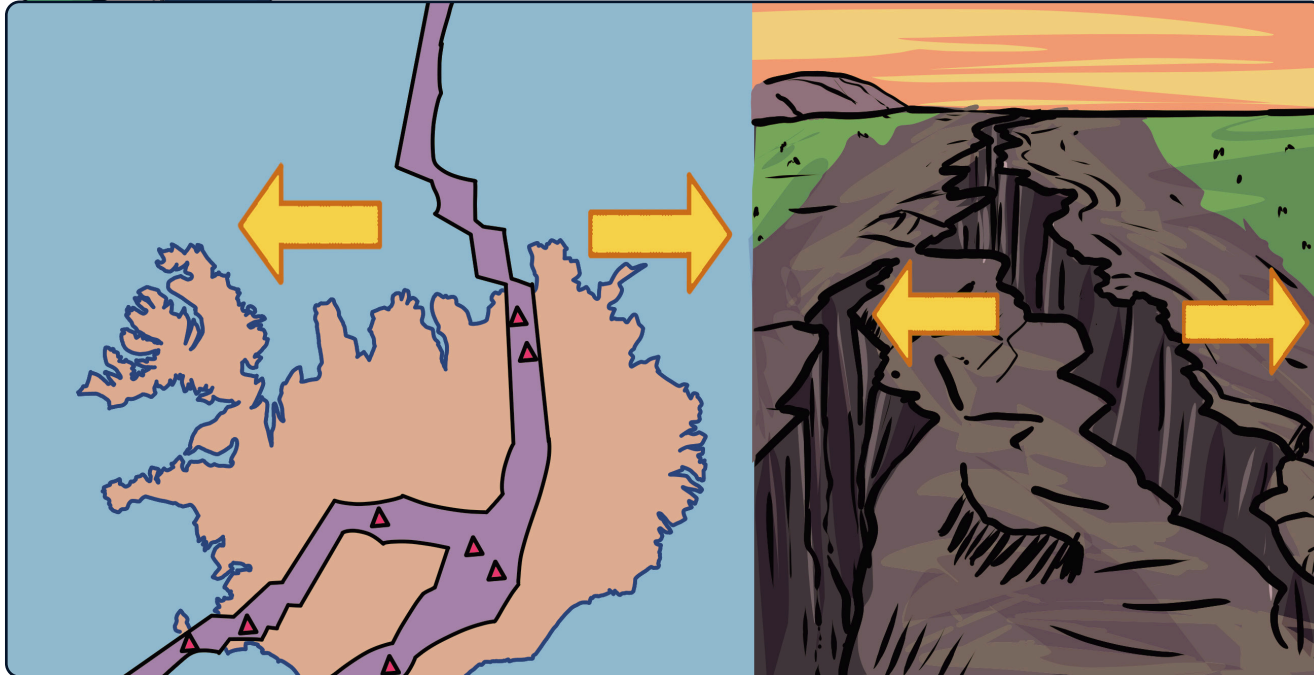


Are the plates still moving?



Hi, I'm **Britany**.

If you would like to see the gap between two of the plates, watch this video of the plates in Iceland: <https://www.youtube.com/watch?v=546Ov8uaLDI>



The plates move about **1 to 10 cm every year**.

Plates can **move towards each other**, away from each other or rub alongside each other.



How do tectonic plates move?

As the plates move, they interact at their boundaries in different ways.

- At one type of boundary, the **plates slide alongside** each other.
- At another type, the **plates crash into each other**. In this case, the edge of one plate may slide under another plate and be destroyed. Alternatively the two edges of the plates may rise and form mountains.
- At the third type of boundary, the plates move apart and **create valleys**. Sometimes, the melted rock beneath the plates rises. This melted rock, or magma, cools as it rises and forms a new crust.

Earthquakes and volcanoes often happen along plate boundaries.



How do tectonic plates move?

Plates can move towards each other, away from each other or rub alongside each other.

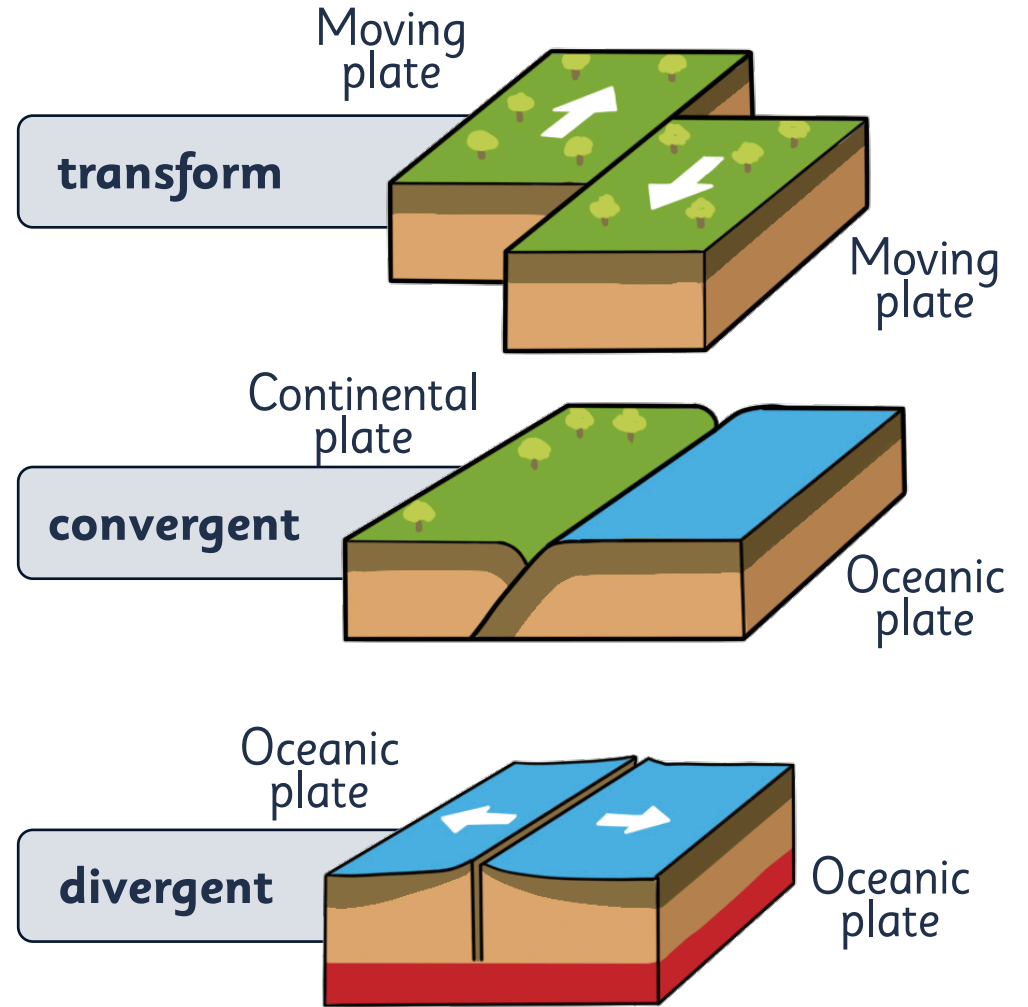
There are **three types** of major **plate boundary** movements.

These types of movement include:

transform - where plates slide past each other

convergent - where plates come together

divergent - where plates are pulled apart from each other



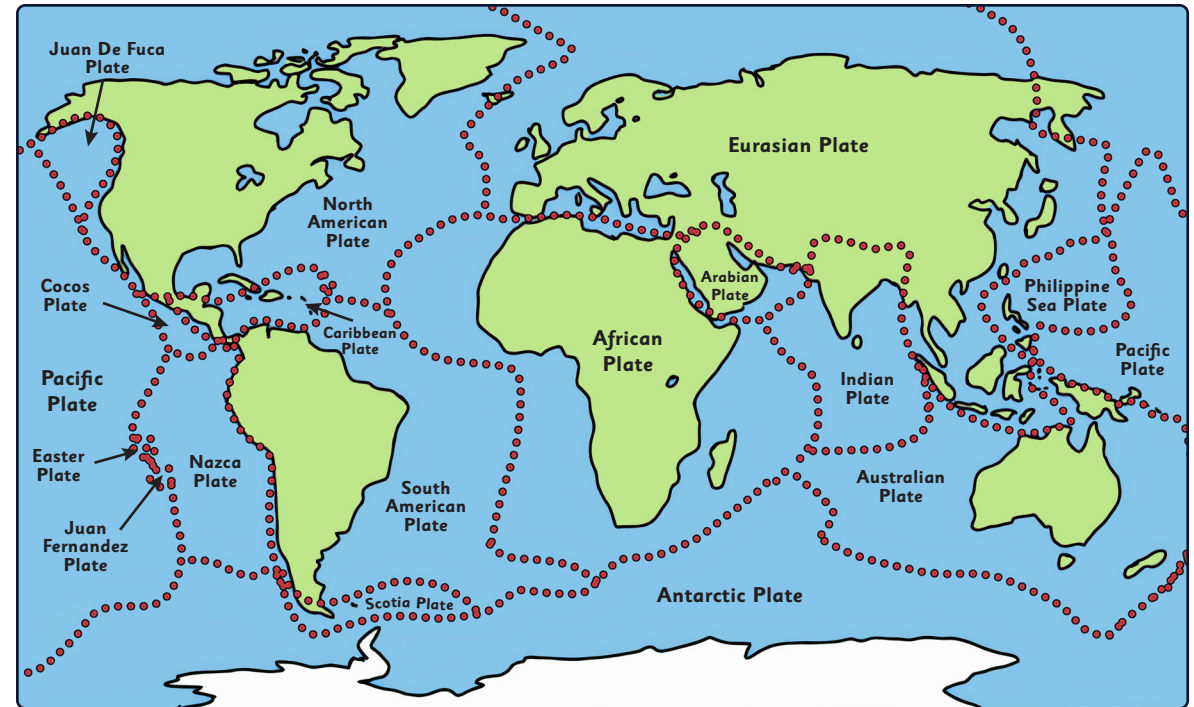
Where in the world are the plate lines?

Discuss this image with your learning partner showing the different tectonic plates.

Answer these questions:

- What can you see?
- On which continents or countries do the edges of the plates meet?
- Do you think you can see the plate lines from an aerial view of the world?

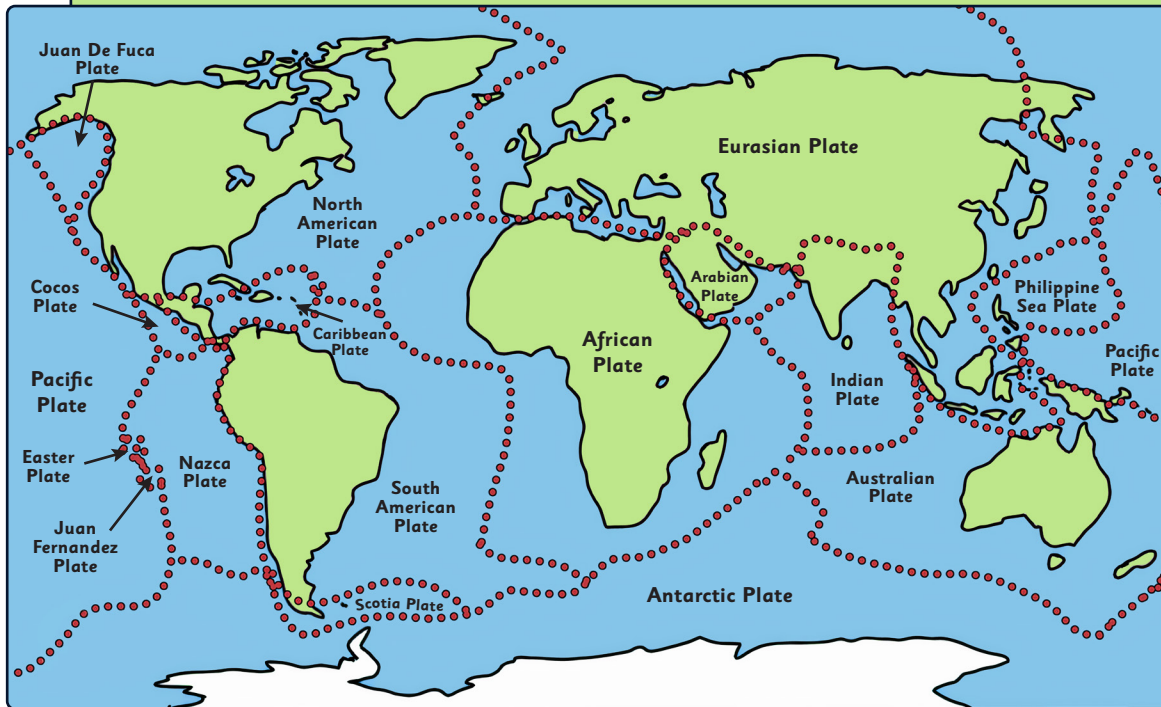
Be ready to **share your feedback** with the class.



Where in the world are the plate lines?

answers

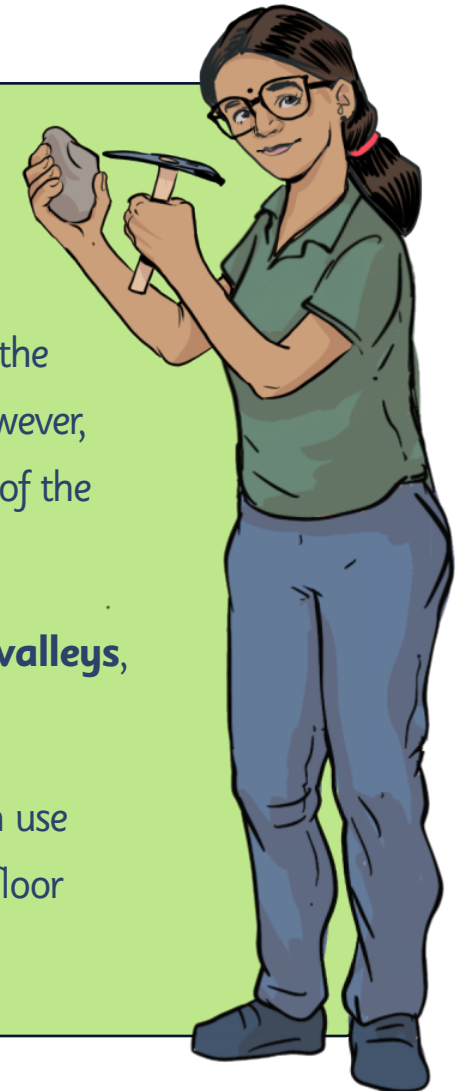
The North American Plate and the Pacific Plate meet in California, America; the Eurasian Plate and African Plate meet in Italy; the Nazca Plate and the South American Plate meet in South America.



Most of the time, you **can't see** the plate lines in an aerial photo. However, you can sometimes see evidence of the **tectonic plates moving**.

Evidence you might see includes **valleys**, **mountains** and **volcanoes**.

With today's technology, you can use **Google Images** to see the sea floor and some of the plate lines.



Where in the world am I?

Take a look at this image with your learning partner and discuss where it is in the world.

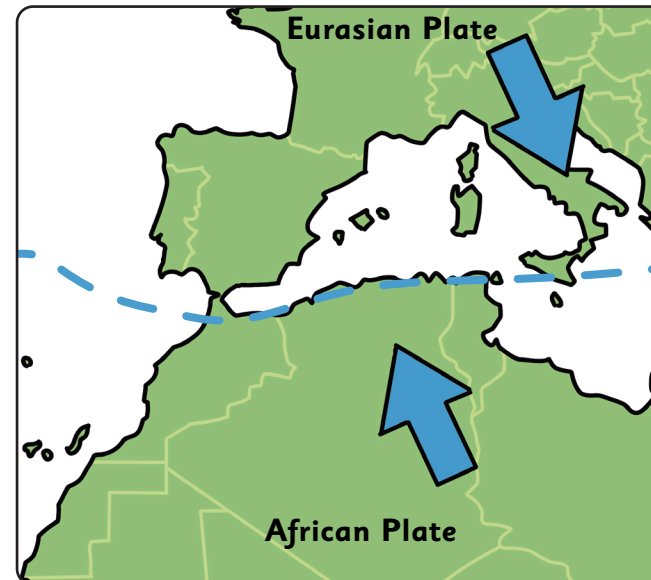
Discuss the following questions:

- What can you see?
- Which countries can you spot?
- Which continents can you see?
- Are there countries the plate lines are very close to?

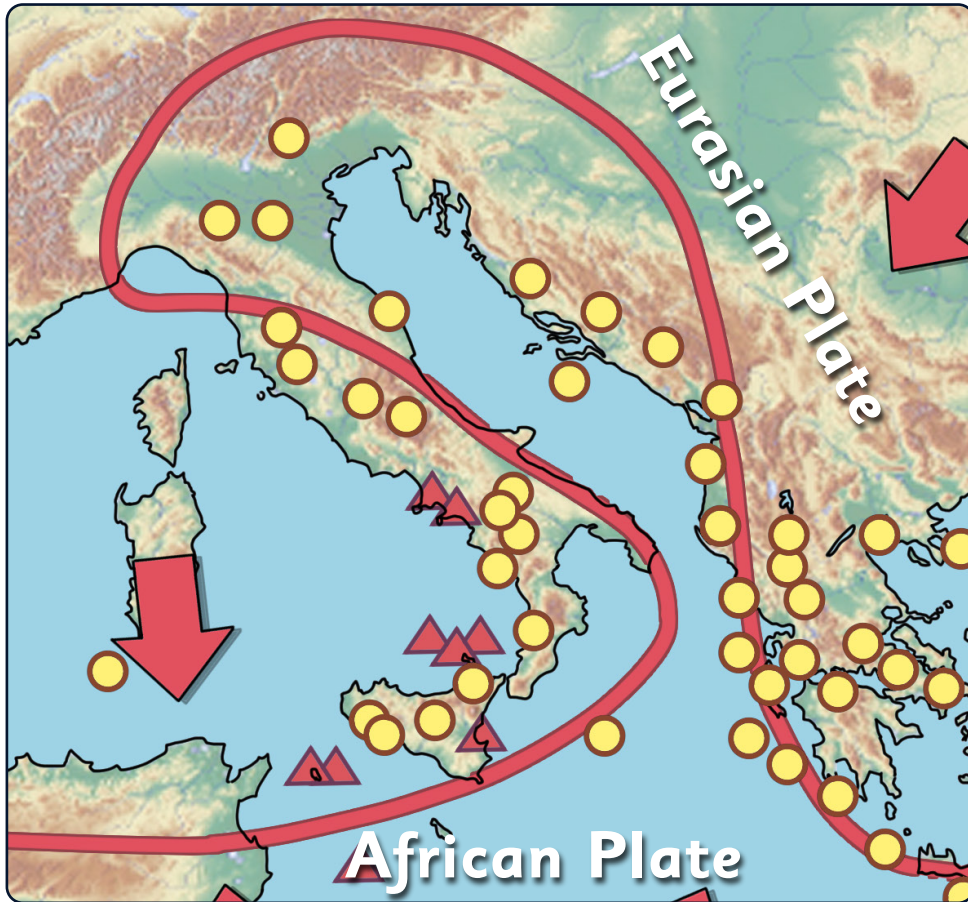
Be ready to **share your feedback** with the class.

Hi! My name is **Clayton**.

Let's take a closer look. This is a **boundary line** of two tectonic plates.



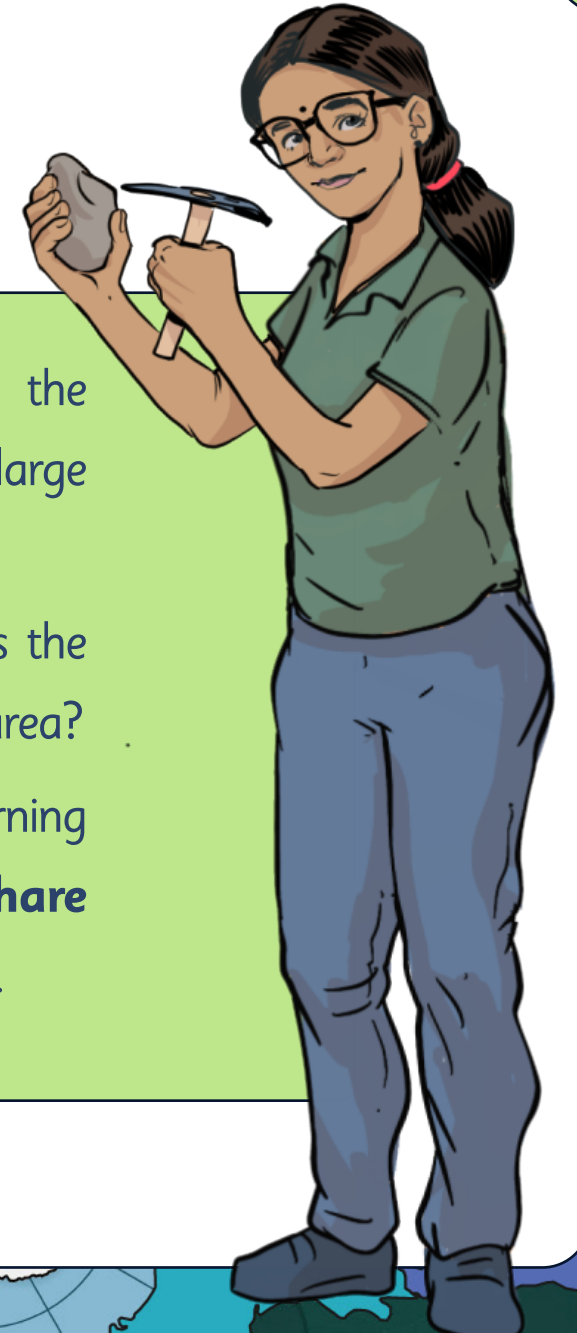
Tectonic plates near Italy



Italy is sandwiched between the huge **African plate** and the large **Eurasian Plate**.

How do you think this affects the **physical geography** of the area?

Discuss this with your learning partner, and be ready to **share your feedback** with the class.



The region of Campania, Italy

Naples is the regional capital of **Campania**.

Mount Vesuvius is a **mega volcano** made up of **24 craters**, and the eruptions might be disastrous.

Naples lies directly adjacent to Mount Vesuvius, the volcano that erupted in **79 AD**, destroying **Pompeii**.

The region is subject to **high-level earthquakes, underground explosions** and **volcanic eruptions**.



Activity 1



Use the knowledge you have gained and identify the tectonic plates on your **activity 1 worksheet**.

What is plate tectonics?
Key Geographical Skills: Physical Geography
Key Geographical Concepts: Physical Processes



Use the knowledge you have gained and the maps provided to label the tectonic plates on the map below.



What is plate tectonics?
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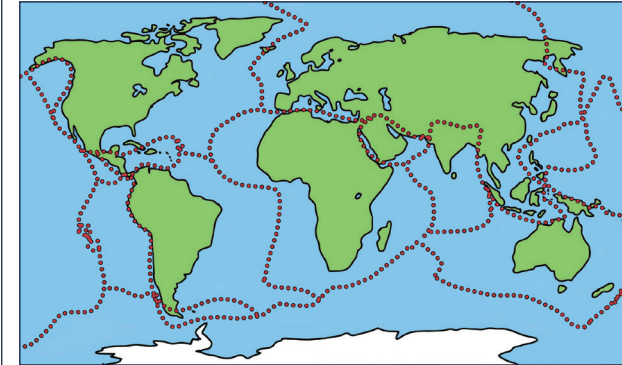
Use the knowledge you have gained and the maps provided to label the world's tectonic plates. Use the knowledge you have gained and the maps provided to label the world's tectonic plates. Use the knowledge you have gained and the maps provided to label the world's tectonic plates.



What is plate tectonics?
Key Geographical Skills: Physical Geography
Key Geographical Concepts: Physical Processes



Use the knowledge you have gained and the maps provided to **cut out** the tectonic plates and **stick** them **onto the map** in the correct places.



South American Plate	Eurasian Plate	Australian Plate	Caribbean Plate
Pacific Plate	Antarctic Plate	African Plate	North American Plate

True or False?

Decide if the following statements are true or false.

Tectonic plates can move.

Italy is between the Northern American and Caribbean plates.

Valleys and mountains are created by tectonic plates moving.

The Earth's core causes volcanoes and earthquakes.

True	False
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

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Challenge



Using an **atlas** or a **world map**, locate which tectonic plate lines run through the countries.

Complete your **challenge worksheets** to determine which type of geographical phenomena you might find in these countries.

How the moving tectonic plates affect places

Key Geographical Skills: Physical Geography

Key Geographical Concepts: Physical Processes

On which tectonic plates are these countries located? Use a world map or an atlas to help you.

1. Canada _____
2. Brazil _____
3. Iceland _____
4. Italy _____
5. Egypt _____

Which geographical phenomena are caused by tectonic plates moving?

- | | | | |
|------------|--------------------------|----------------|--------------------------|
| volcanoes | <input type="checkbox"/> | river overflow | <input type="checkbox"/> |
| hurricanes | <input type="checkbox"/> | earthquakes | <input type="checkbox"/> |
| valleys | <input type="checkbox"/> | cyclones | <input type="checkbox"/> |

Isla and Kimberly are going on holiday to two different geographical phenomena. Decide if they were caused by tectonic plates moving towards, or apart from, each other.



Hi! My name is Isla. I am taking a trip to a valley in Iceland.

I think the plates moved:



Hi! My name is Kimberly. I am taking a trip to the mountains in the Italian Alps.

I think the plates moved:
