

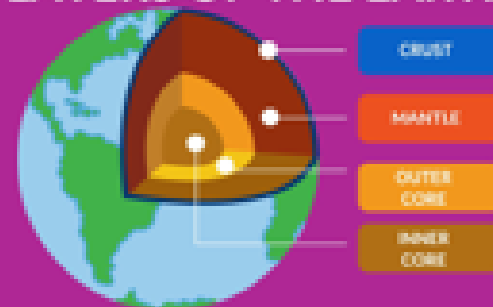


Why do we have natural disasters?

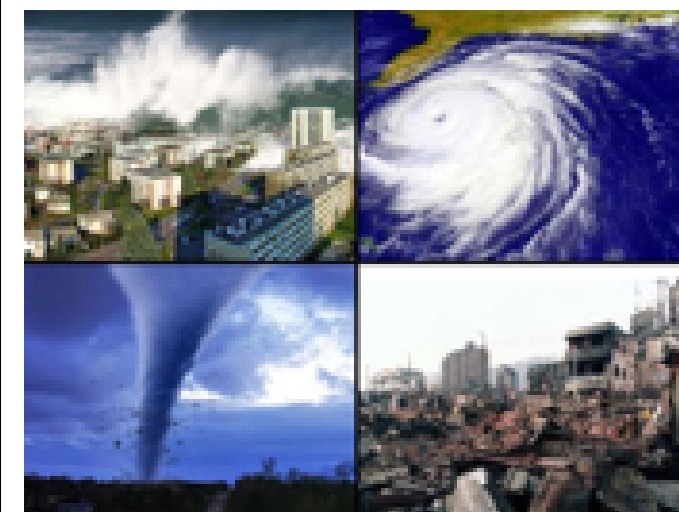
Key Vocabulary

<u>Tectonic plates</u>	A massive slab of solid rock made up of Earth's lithosphere (crust and upper mantle).
<u>continents</u>	A continent is a large continuous mass of land conventionally regarded as a collective region.
<u>earthquake</u>	A sudden violent shaking of the ground, typically causing great destruction, as a result of movements within the earth's crust or volcanic action.
<u>volcano</u>	A mountain or hill, typically conical, having a crater or vent through which lava, rock fragments, hot vapour, and gas are or have been erupted from the earth's crust.

LAYERS OF THE EARTH



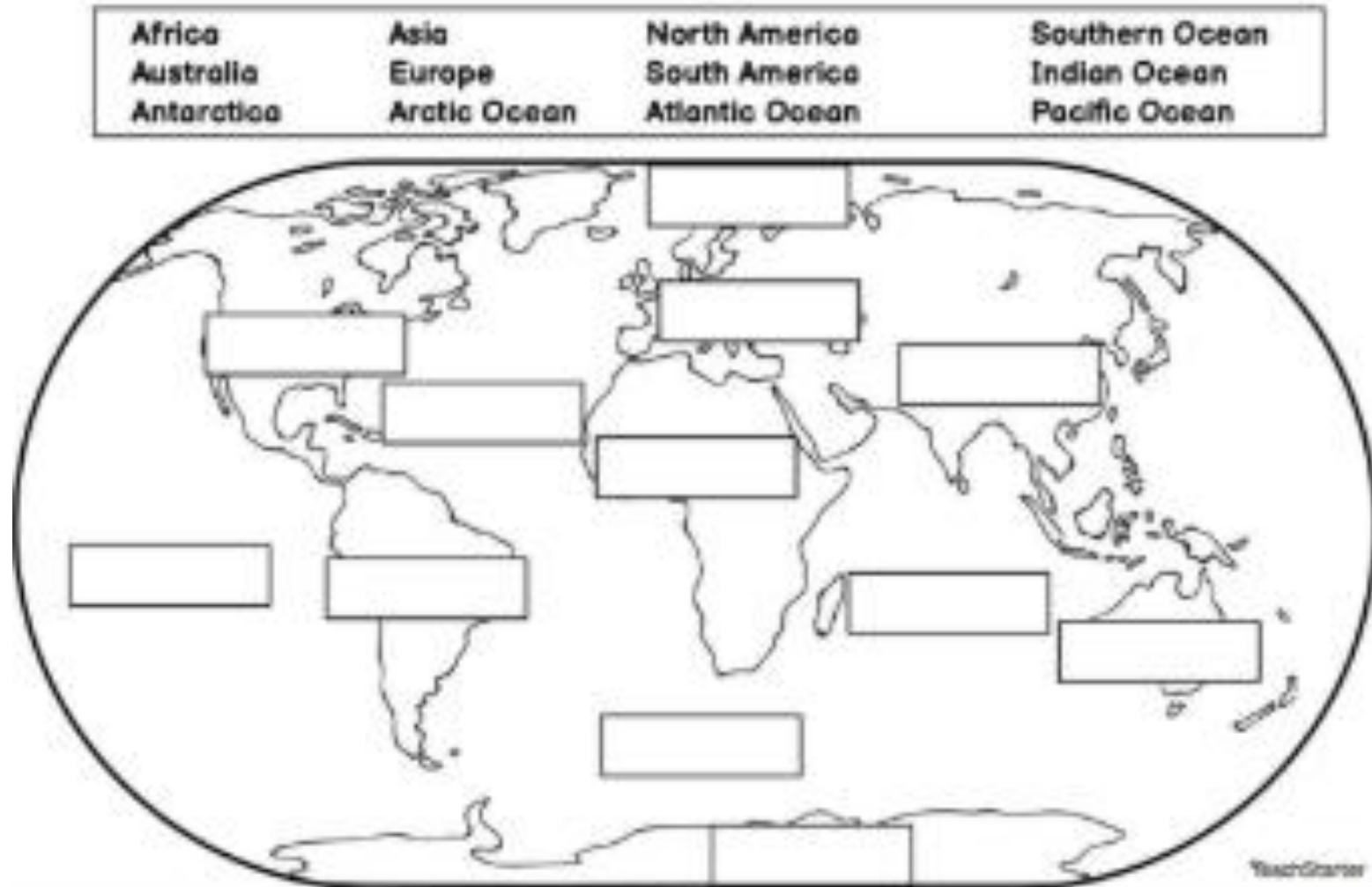
Starting at the centre, Earth is composed of four distinct layers. They are, from deepest to shallowest, the inner core, the outer core, the mantle and the crust. Except for the crust, no one has ever explored these layers in person. In fact,



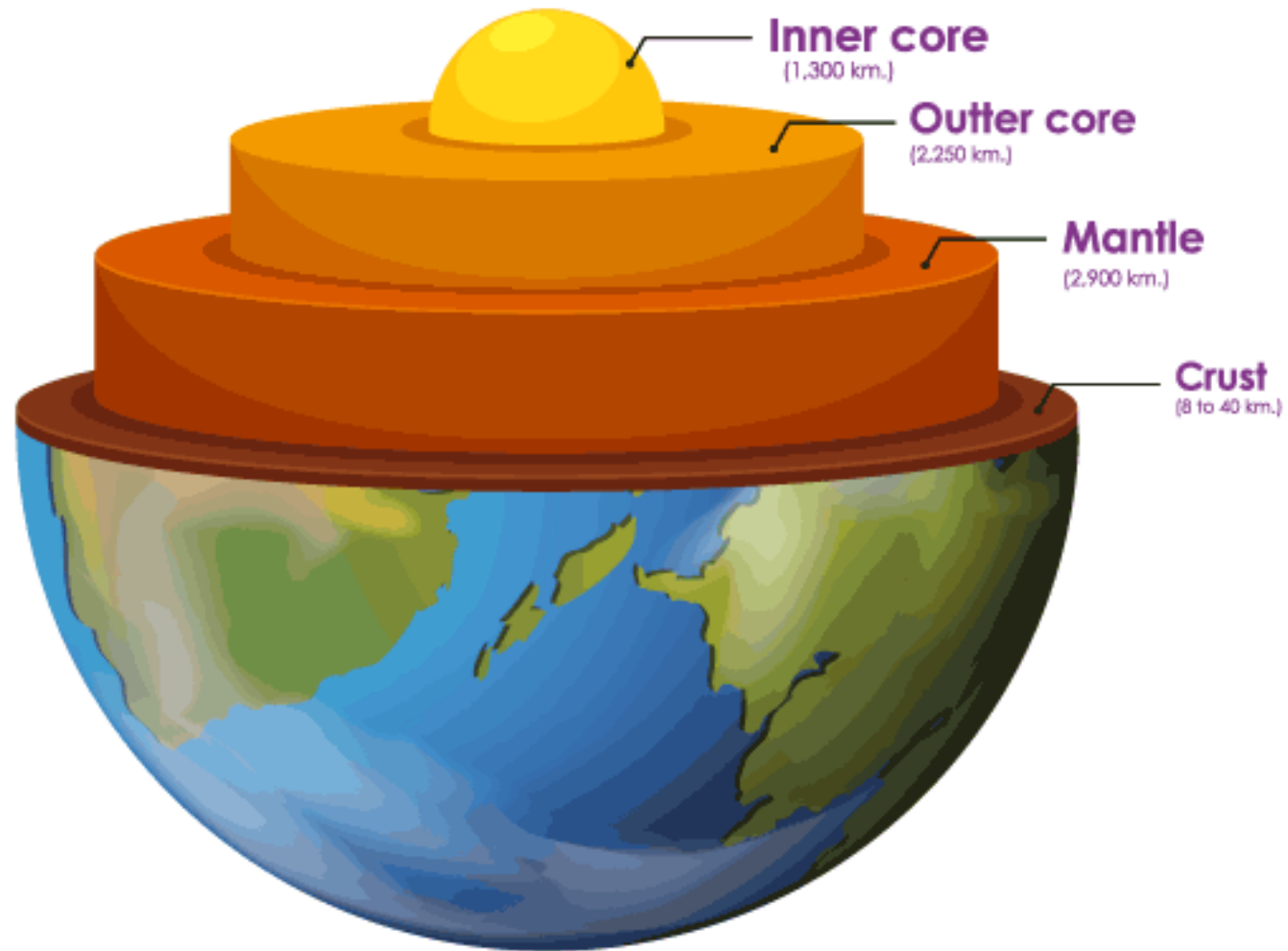
A natural disaster is the very harmful impact on a society or community after a natural hazard event. Some examples of natural hazard events include

L.O. To know that our planet is made up of different layers.

Flashback



THE LAYERS OF EARTH



<https://www.youtube.com/watch?v=WjXSCumeqxo>

The Inner Core

It is the centre and the hottest layer of the Earth. The inner core is solid and made up of iron and nickel with temperatures up to $5,500^{\circ}\text{C}$. Due to its immense heat energy, the inner core is more like the engine room of the Earth.

The Outer Core

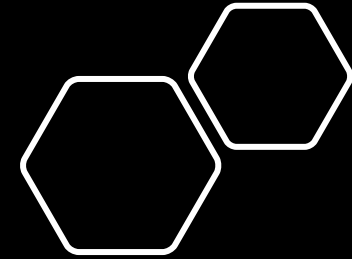
The outer core of the Earth is similar to a very hot ball of metals, whose temperature is around 4000 ^{°F} to 9000^{°F}. It is so hot that the metals inside are all liquid. The outer core is around 1800 miles under the crust and is approximately 1400 miles thick. It is composed of metals such as iron and nickel. The outer core surrounds the inner core.

The inner core has pressures and temperatures so high that the metals are squeezed together and not able to move like a liquid but are forced to vibrate instead of solid.

Mantle

Mantle is the widest section of the Earth. Its thickness is approximately 2,900 km. The mantle is mainly made up of semi-molten rock known as magma. The rock is hard in the upper part of the mantle, but lower down the rock is softer and begins to melt.

The mantle is located directly under the Sima. The mantle consists of very hot and dense rock. This layer of rock flows like asphalt under heavy weight. This flow is because of the greatest temperature differences from the bottom to the top of the mantle. The reason behind the plates of the Earth moving is the movement of the mantle. Its temperature varies between 1600 °F at the upper part to 4000 °F near the bottom.



Crust

The crust is the outer layer where we live. The thickness is around 0-60 km. It's a solid rock layer divided into two types:

1. Continental crust covers the land and,
2. Oceanic crust covers water

The crust is the most widely studied and understood. The mantle is hotter and capable of flowing. The outer and inner core is much hotter with great pressures that you can squeeze into a ball smaller than marble if you are able to go to the centre of the Earth.

Activity

In your books, glue in the image of the layers of the Earth and answer the questions. **Please write the questions into your books.**

- 1) Name the different layers of the Earth.***
- 2) Which layer is at the centre and the hottest layer of the Earth?***
- 3) The Outer Core is composed of which metals?***
- 4) What is the temperature of the Outer Core of the Earth?***
- 5) Which is the widest section of the Earth and what is its thickness?***

L.O. To explain how the movement of tectonic plates has shaped the world today.



FLASHBACK



DRAW A DIAGRAM AND LABEL
THE LAYERS OF THE EARTH.

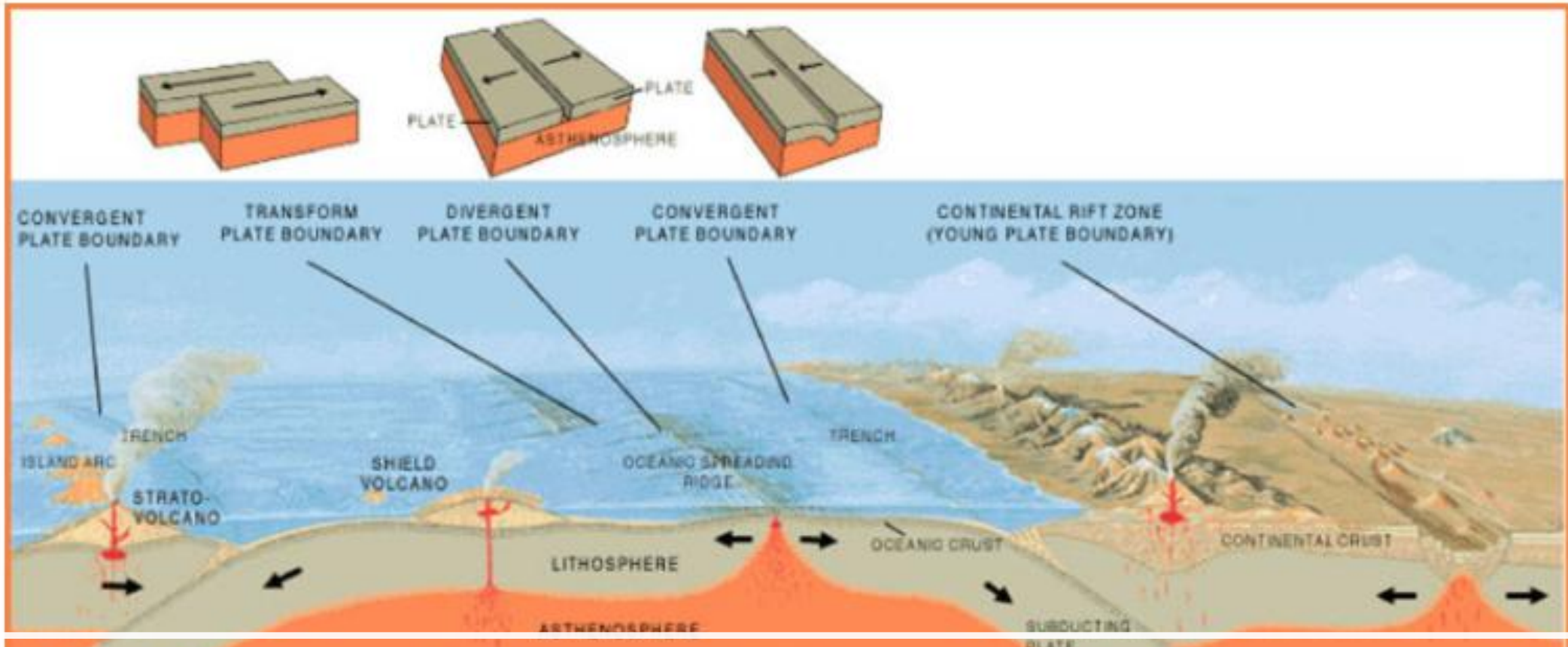


How have these natural features been caused?

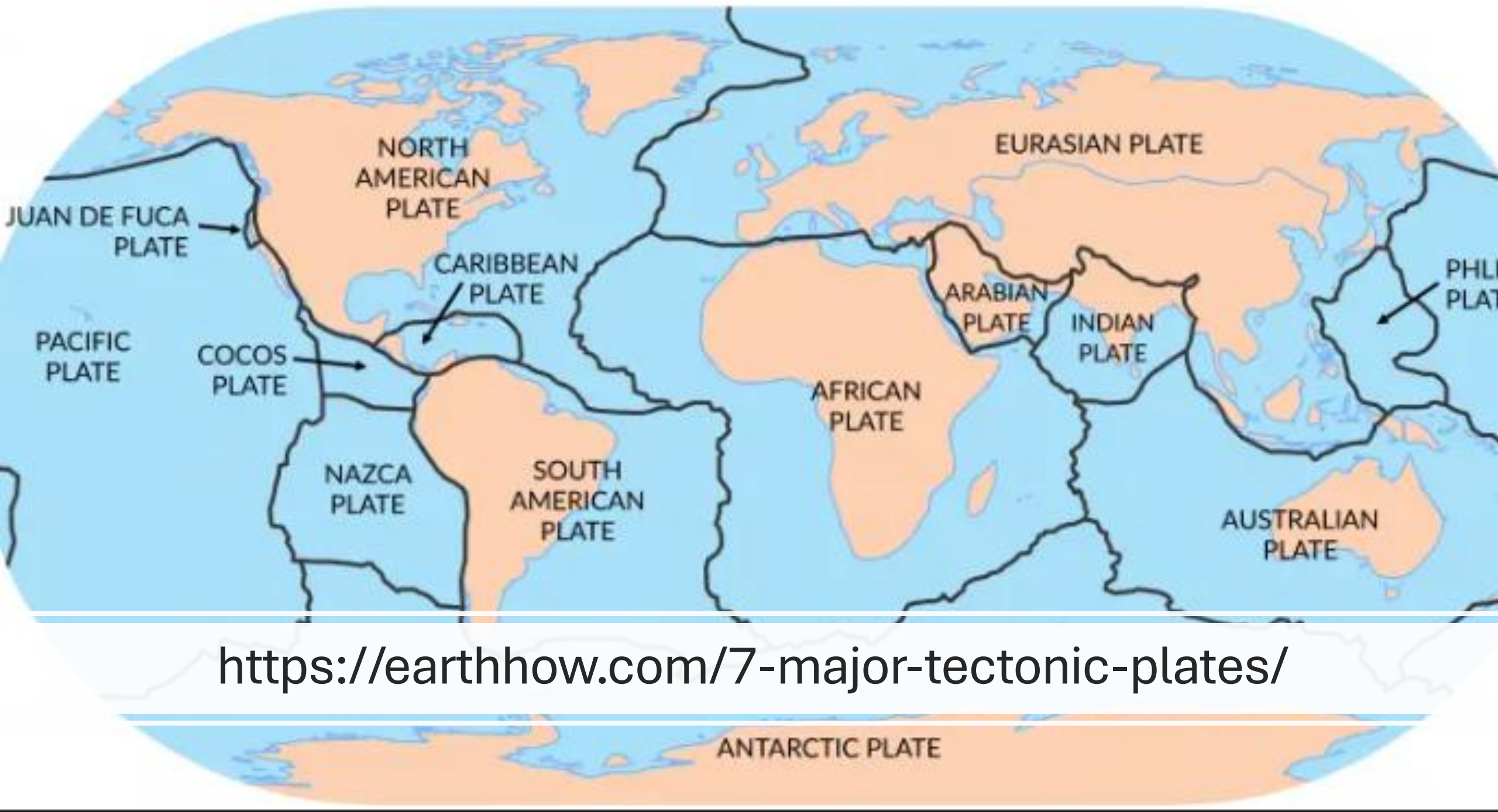
Generate some questions about these images.

There are three kinds of plate tectonic boundaries: divergent, convergent, and transform plate boundaries.

https://www.youtube.com/watch?v=2_e0PuPl9js



Tectonic Plate Boundaries



<https://earthhow.com/7-major-tectonic-plates/>

Card Match Up

 Volcanoes Volcanoes happen when hot melted rock (called magma) <u>riees, up</u> from inside the Earth and escapes through cracks in the crust. This can cause eruptions with lava, ash, and gases.	 Earthquakes Earthquakes happen when pieces of the Earth's crust suddenly move past each other. This movement sends out strong vibrations called seismic waves that shake the ground.	 Mountain Ranges Mountain ranges form when huge pieces of the Earth's crust push into each other over millions of years. The land is forced upwards to create mountains.
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 Plates Colliding (Convergent Boundary) Two tectonic plates push towards each other. The land can crumple, fold, or be forced upwards.	 Plates Sliding Past (Transform Boundary) Two plates slide past each other. They can get stuck and then suddenly slip, causing shaking.	 Plates Moving Apart (Divergent Boundary) Two plates move away from each other. Magma rises to fill the gap and creates new land.
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 Pacific Ring of Fire A huge area around the Pacific Ocean where many volcanoes and earthquakes happen. This is because lots of tectonic plates meet here.	 Andes Mountains A very long mountain range in South America. It formed where two tectonic plates collided and pushed the land upwards.	 San Andreas Fault A place where two plates slide past each other. This area often has earthquakes.
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<https://pubs.usgs.gov/gip/dynamic/historical.html>

Activity (Glue in the image of the world)

What was Pangea?

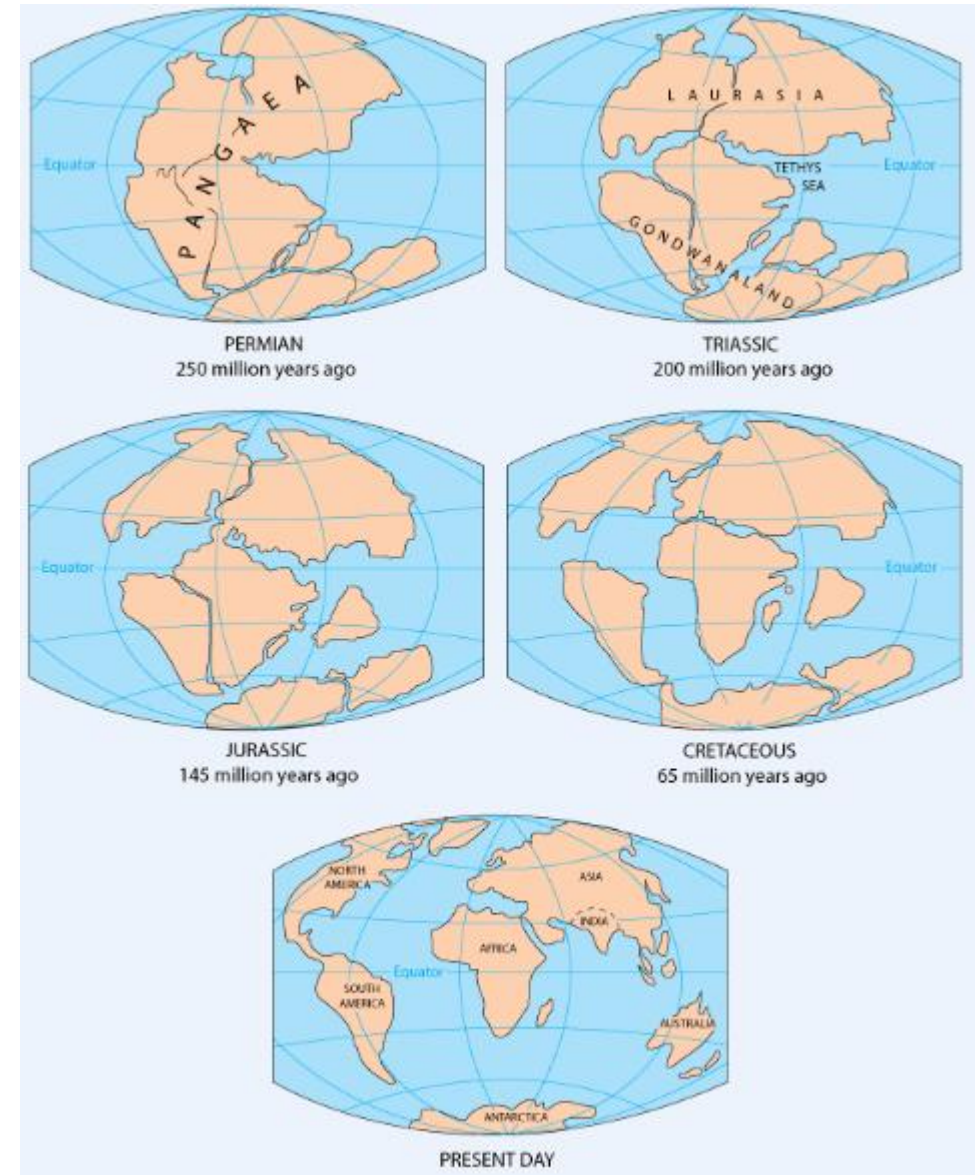
How has the Earth's land mass changed over time?

Why has the Earth's land mass changed over time?

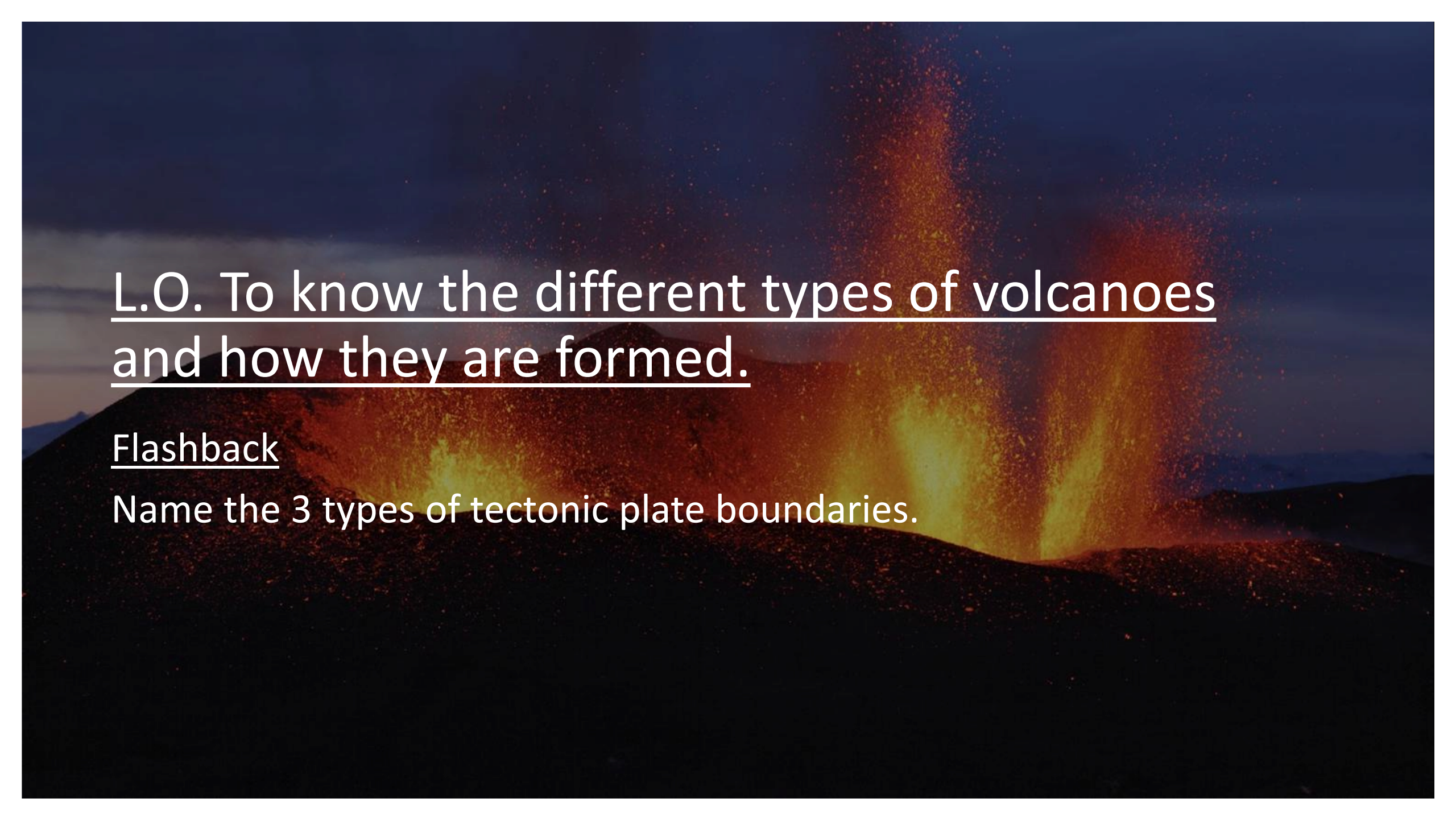
Glue in the image of the plate boundaries and explain.

What are the different types of plate boundaries and how do they work?

You can present this work in the form of a poster.



https://www.youtube.com/watch?v=2_e0PuPl9js

A dramatic photograph of a volcanic eruption at night. A massive, bright orange and yellow plume of fire and ash rises from a dark, silty volcano, illuminating the dark sky. The foreground shows the dark, textured slopes of the volcano.

L.O. To know the different types of volcanoes and how they are formed.

Flashback

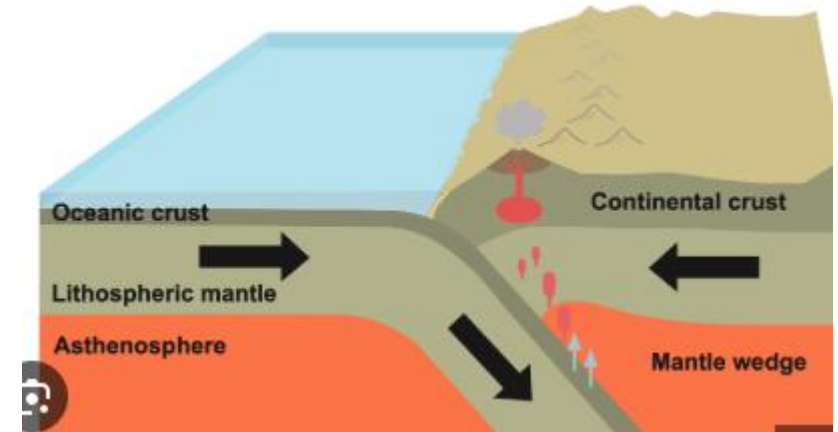
Name the 3 types of tectonic plate boundaries.

<https://www.amnh.org/explore/ology/earth/power-of-plate-tectonics/volcanoes#:~:text=Most%20of%20the%20world's%20volcanoes,under%2C%20a%20thicker%20continental%20plate.>

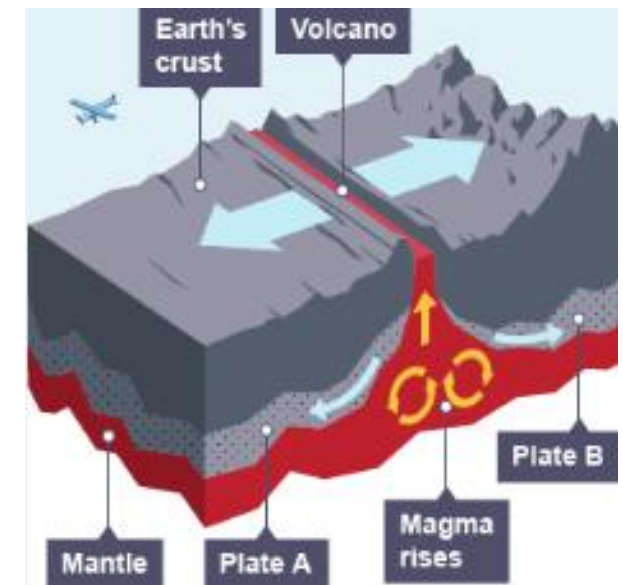
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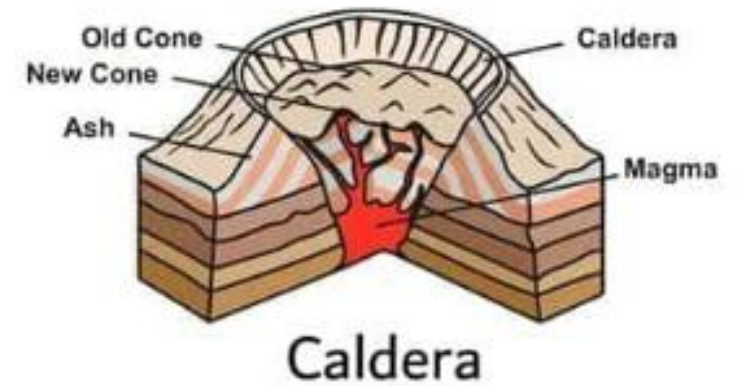
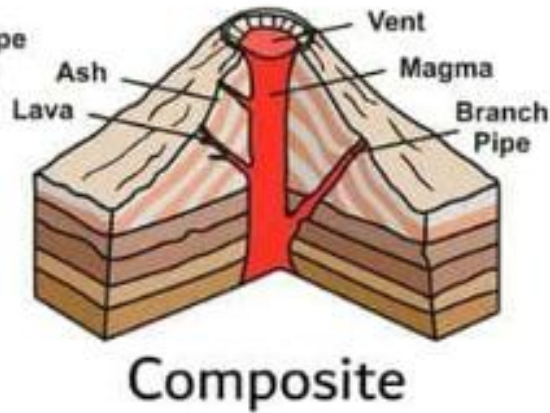
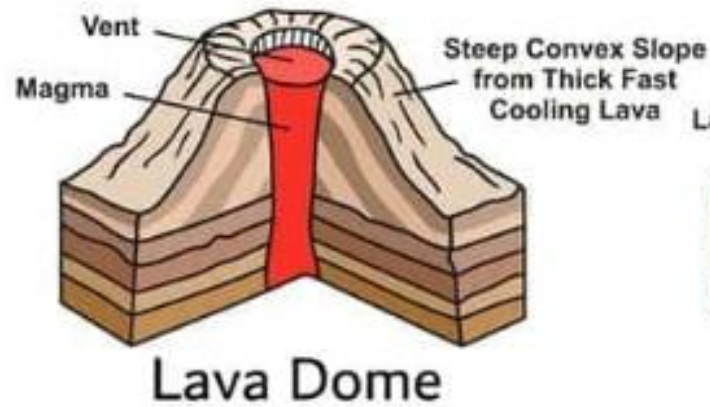
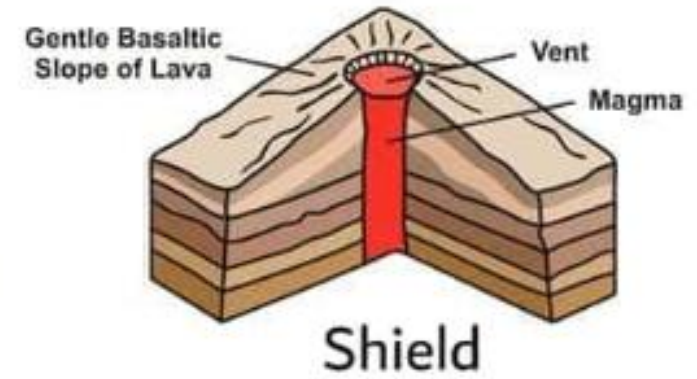
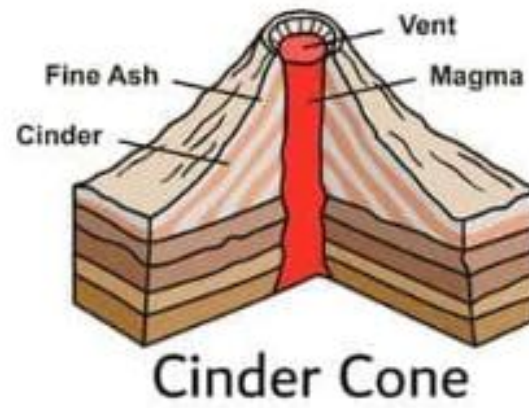
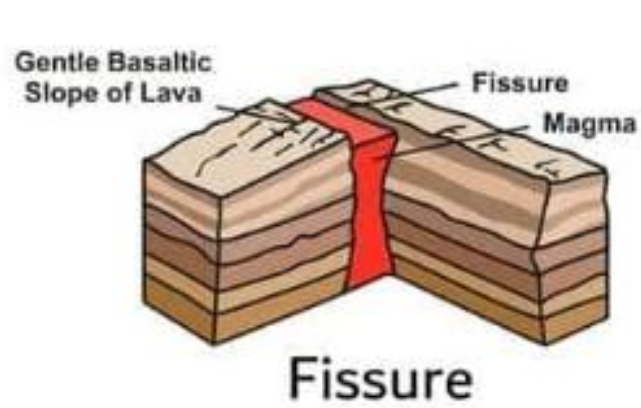
Destructive

Draw and label the two types of plate boundary to demonstrate how volcanoes are formed. Do you know of any other names for these plate boundaries?



Constructive

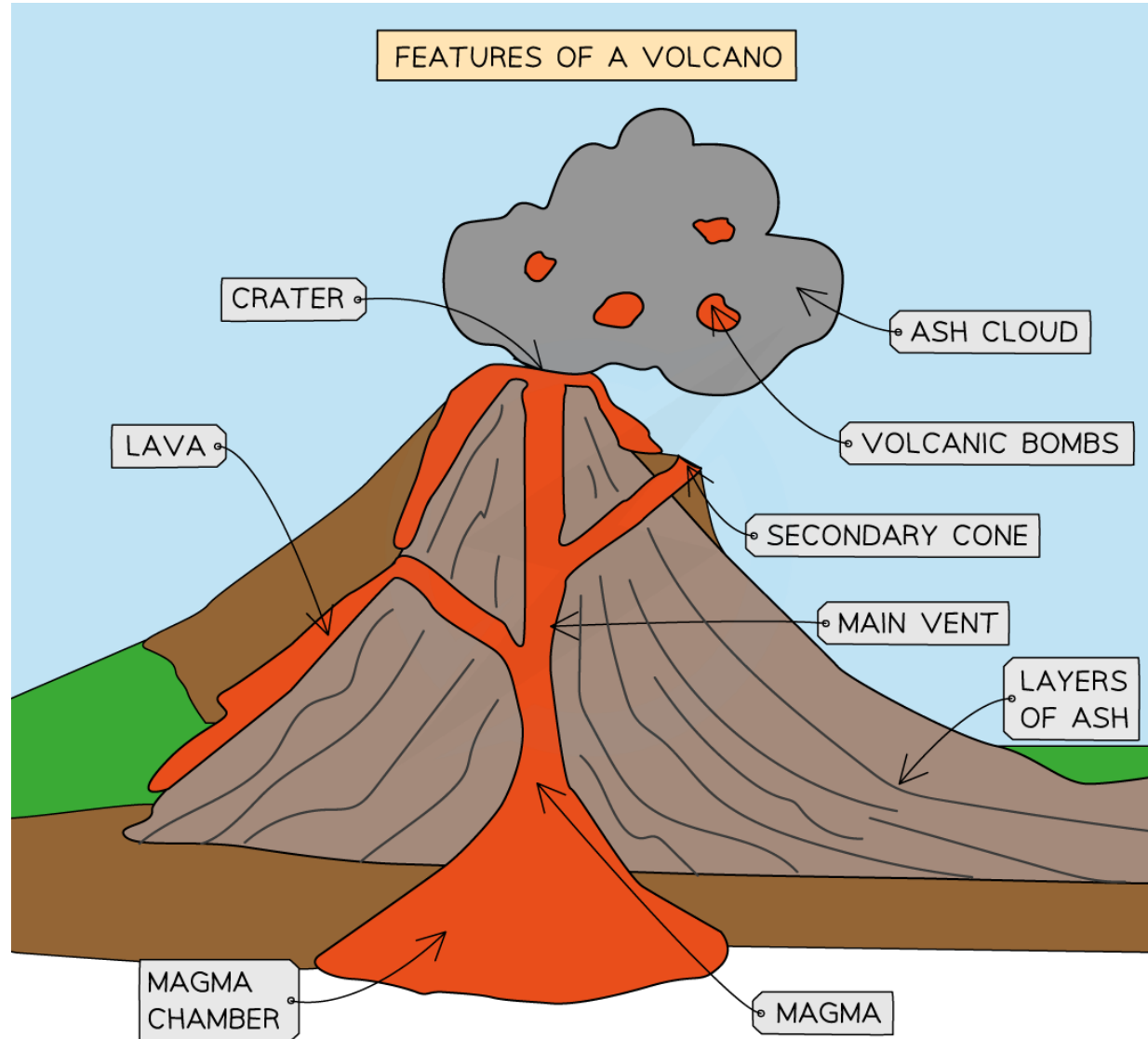




Draw and label the different types of volcano and explain how they are formed.



L.O. To identify the
features of a volcano
and study volcanoes
from around the
globe.



The impact of eruptions: Eyjafjallajökull, Iceland



Geography

Unit: Mountains and volcanoes

Keywords

Diverge

To **diverge** is to go in different directions from the same starting point.

Economy

The **economy** is the way money in a particular area is made and spent.

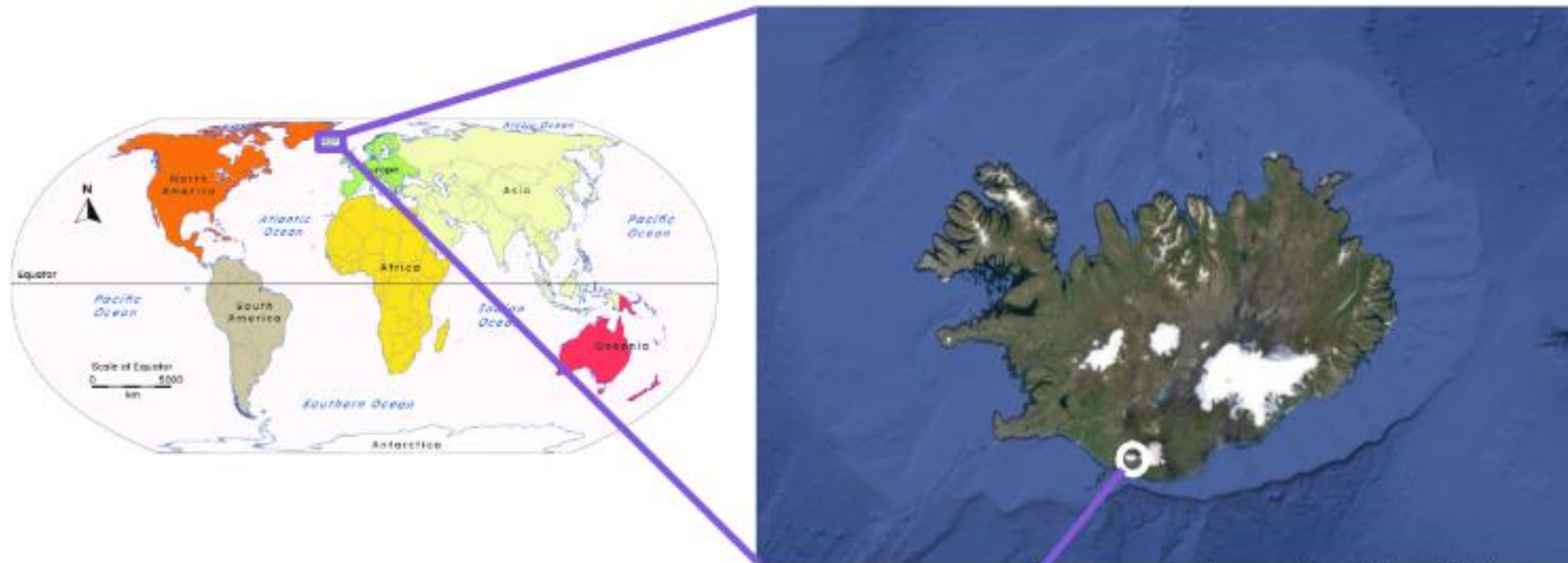
Meltwater

Meltwater is water from the melting of snow or ice.

Why is the Mid-Atlantic Ridge important?



Eyjafjallajökull is a volcano located in southern Iceland.



Eyjafjallajökull

Imagery ©2024 TerraMetrics,
Map Data ©2024



Why is the Mid-Atlantic Ridge important?



It erupted on 14 April 2010. The eruption continued for over one month.



Why is the Mid-Atlantic Ridge important?

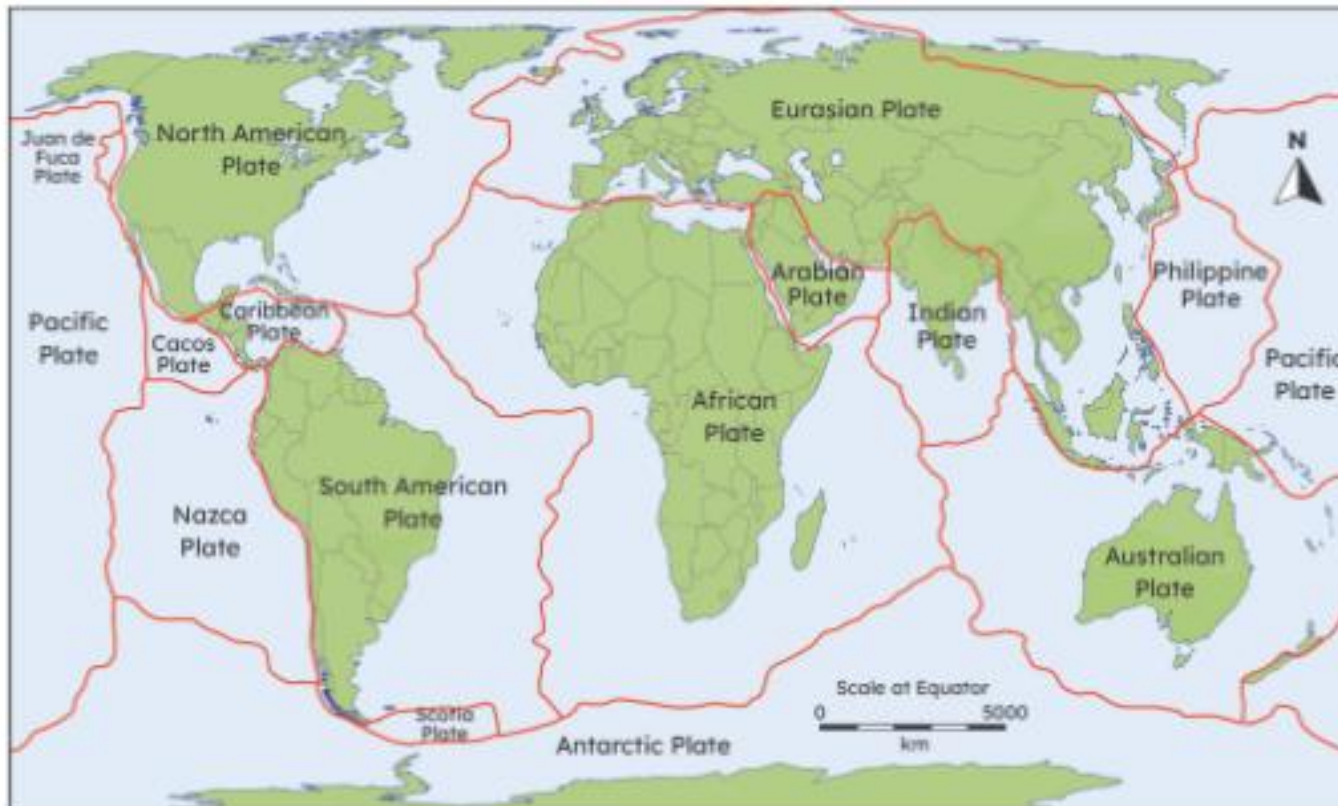


Eyjafjallajökull is a hard name for many of us to pronounce. Journalists gave it the nickname E15, which is more commonly used outside of Iceland.



Why is the Mid-Atlantic Ridge important?

Earth's crust is broken up into a series of pieces called tectonic plates.

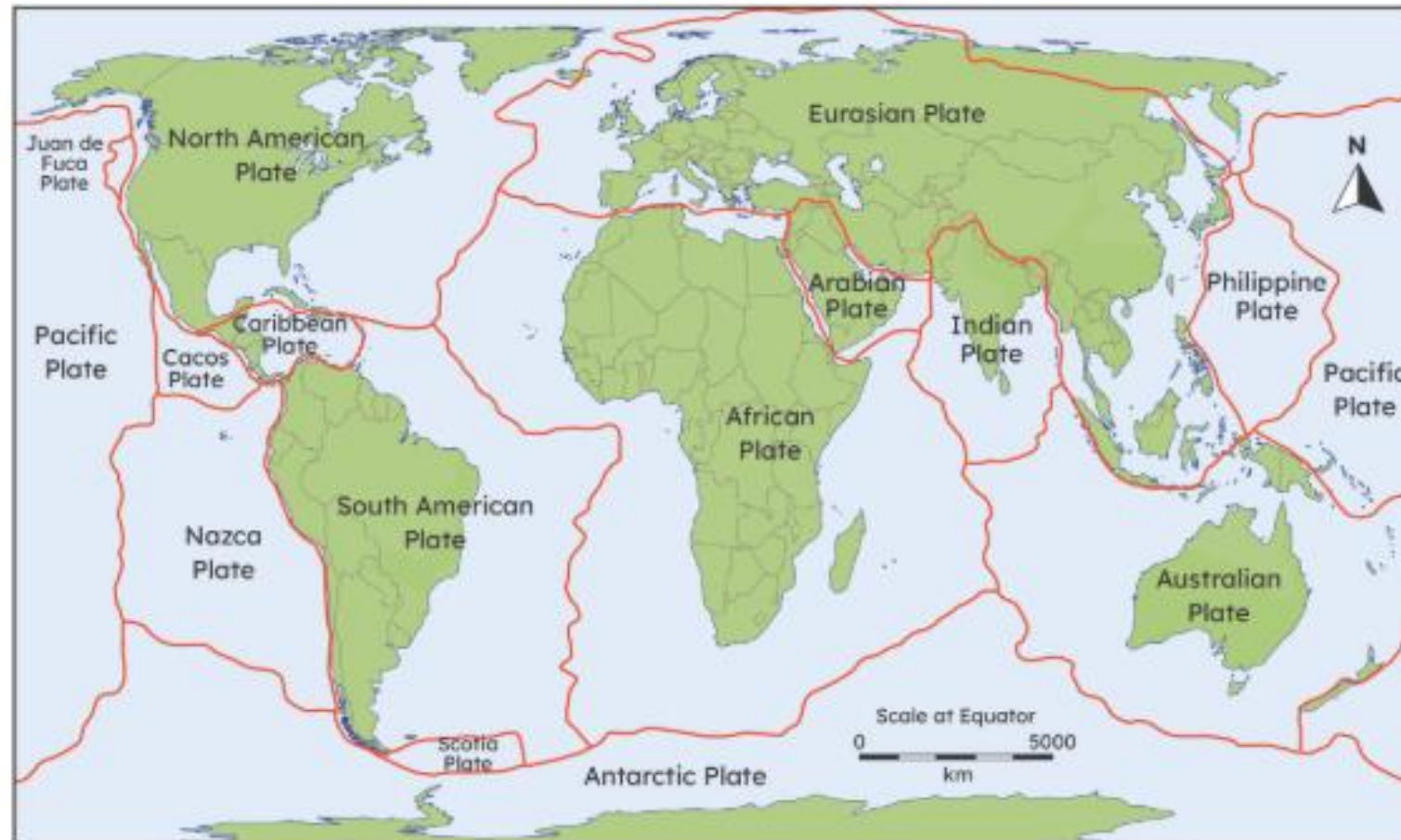


This map shows the boundaries of the tectonic plates and where they are in relation to the continents.



Why is the Mid-Atlantic Ridge important?

Do you know where Iceland is on a map?



Why is the Mid-Atlantic Ridge important?

What do you notice about where Iceland is located?



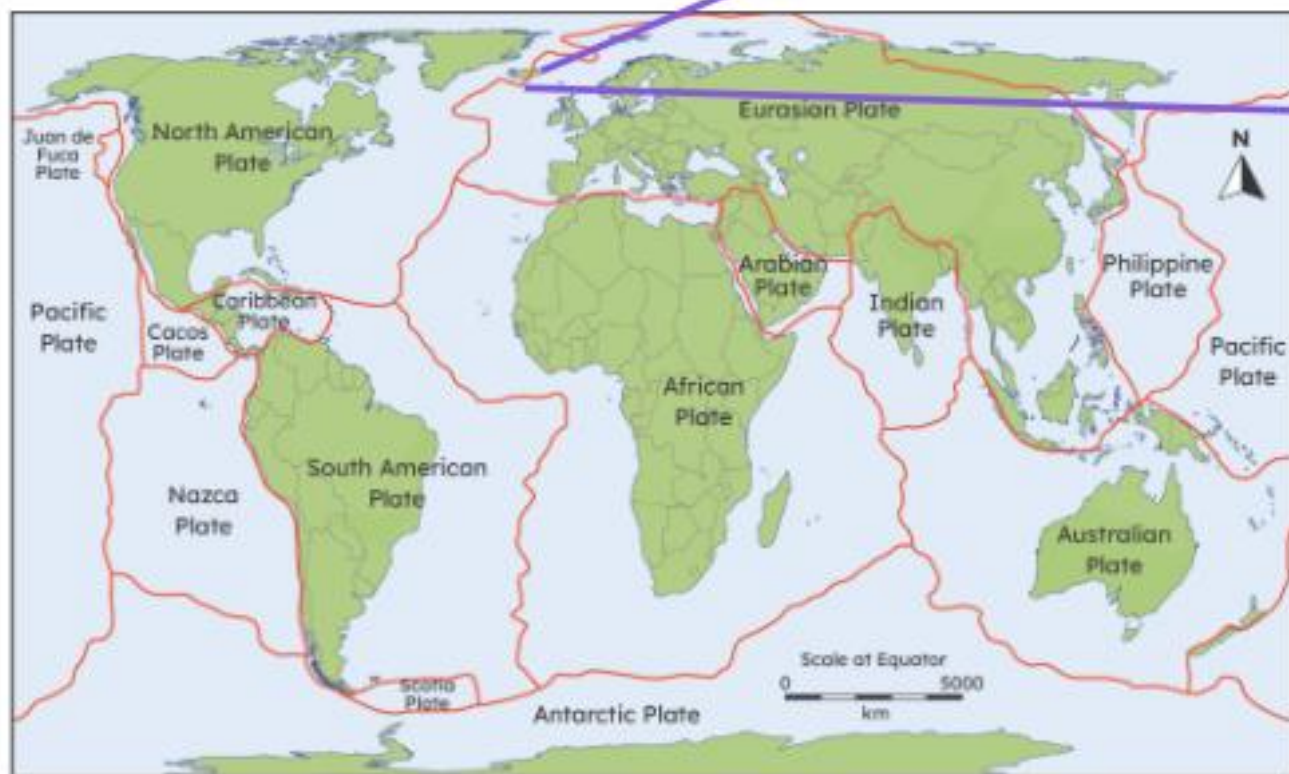
Iceland is located on the red line, which is a tectonic plate boundary.



Why is the Mid-Atlantic Ridge important?

Iceland is located on the **Mid-Atlantic Ridge**.

Iceland

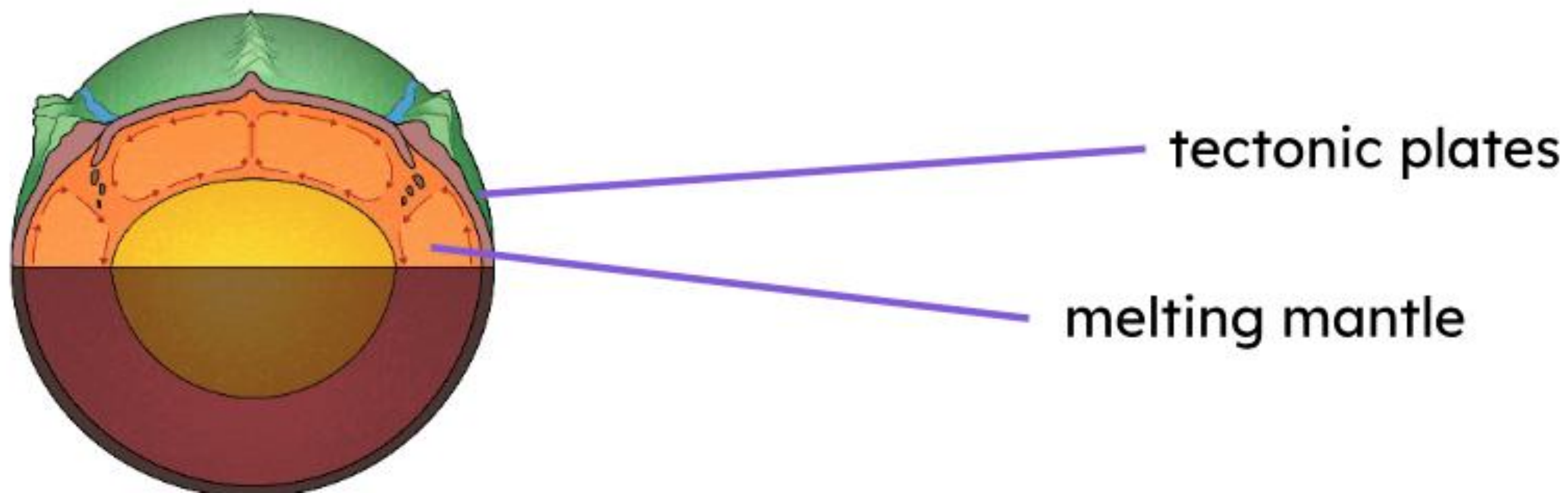


The Mid-Atlantic ridge is a 16,000km long tectonic plate boundary that cuts through the centre of Iceland.



Why is the Mid-Atlantic Ridge important?

Tectonic plates are constantly moving as they sit on top of Earth's mantle, which is constantly melting and moving.





Why is the Mid-Atlantic Ridge important?

At the Mid-Atlantic Ridge, two tectonic plates - the North American plate and the Eurasian plate - **diverge** or move apart.



Why is the Mid-Atlantic Ridge important?

The North American Plate moves to the west and the Eurasian plate moves to the east.

As the plates pull away from each other, molten rock rises between them to form volcanoes.



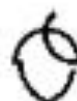
Why is the Mid-Atlantic Ridge important?

The North American Plate moves to the west and the Eurasian plate moves to the east.



As the plates pull away from each other, molten rock rises between them to form volcanoes.

On average, there is a volcanic eruption in Iceland every 5 years.



Fill in the missing words.

Iceland is located on the _____. Here two tectonic plates move apart or _____. These are the North American plate which moves _____ and the Eurasian plate which moves _____ to form volcanoes. The Mid-Atlantic ridge is _____ long and moves apart approximately _____ each year. The eruption here occurred on 14th April _____ and lasted over a _____.

2.5 cm

2010

west

Mid-Atlantic ridge

16,000 km

east month

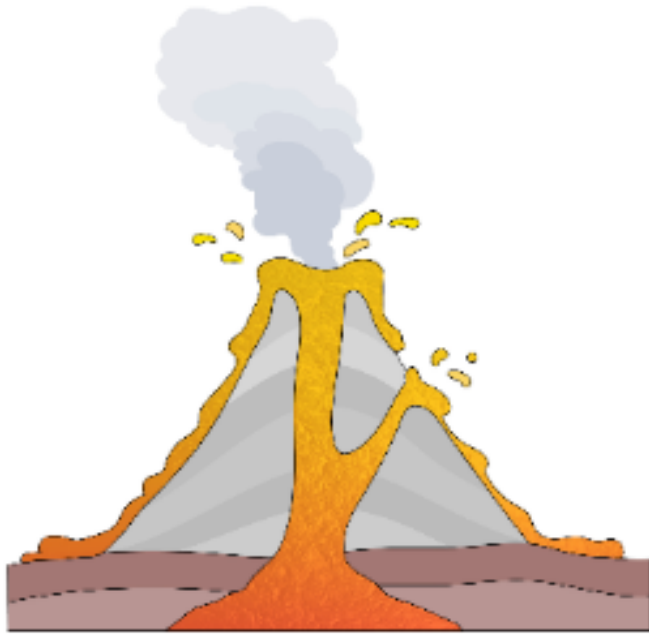
diverge



Check your answers.

Iceland is located on the *Mid-Atlantic ridge*. Here two tectonic plates move apart or *diverge*. These are the North American plate which moves *west* and the Eurasian plate which moves *east* to form volcanoes. The Mid-Atlantic ridge is *16,000 km* long and moves apart approximately *2.5 cm* each year. The eruption here occurred on 14th April *2010* and lasted over a *month*.

When E15 erupted, it lay beneath a 200m thick sheet of ice.



As the magma came to the surface, it caused an explosive eruption as **meltwater** mixed with the lava and formed huge amounts of ash.



The ash rose up to 10,000 km into the atmosphere -
the same height as airplanes.



CC-BY-SA 3.0 Árni Friðriksson

Ash can lead to engine failure so, for safety's sake, flights across Europe were cancelled for one week.

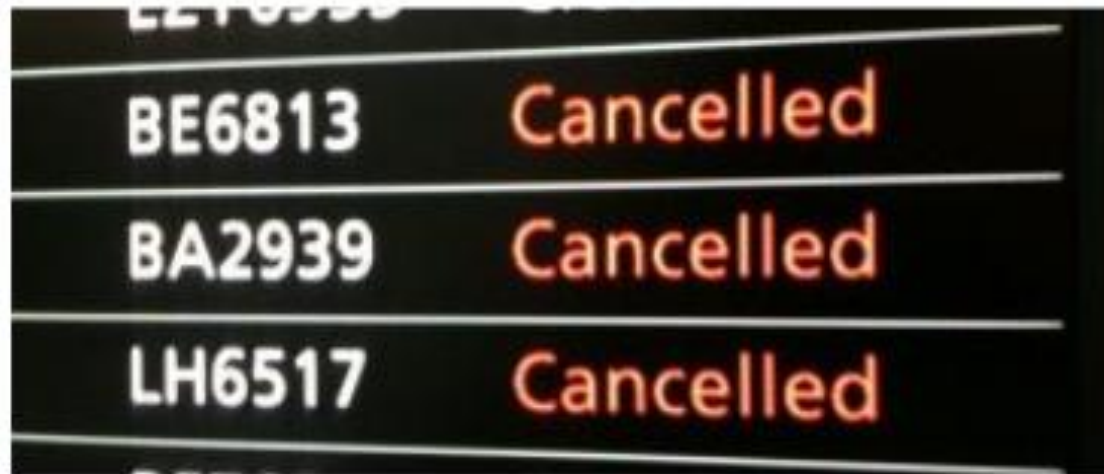


Ash can lead to engine failure so, for safety's sake, flights across Europe were cancelled for one week.



More than 100,000 flights were cancelled.

Cancelled flights caused many problems for Individual passengers and European businesses - this had a huge impact on the European **economy**.



A photograph of an airport flight information display board. The board has a black background with white and red text. It lists three flights that have been cancelled. The flight numbers are in white, and the status 'Cancelled' is in red. The flights are BE6813, BA2939, and LH6517.

BE6813	Cancelled
BA2939	Cancelled
LH6517	Cancelled

Tourism was affected.

Passengers flying into and out of Europe were stranded.

BE6813	Cancelled
BA2939	Cancelled
LH6517	Cancelled

Airline companies lost money in fares.

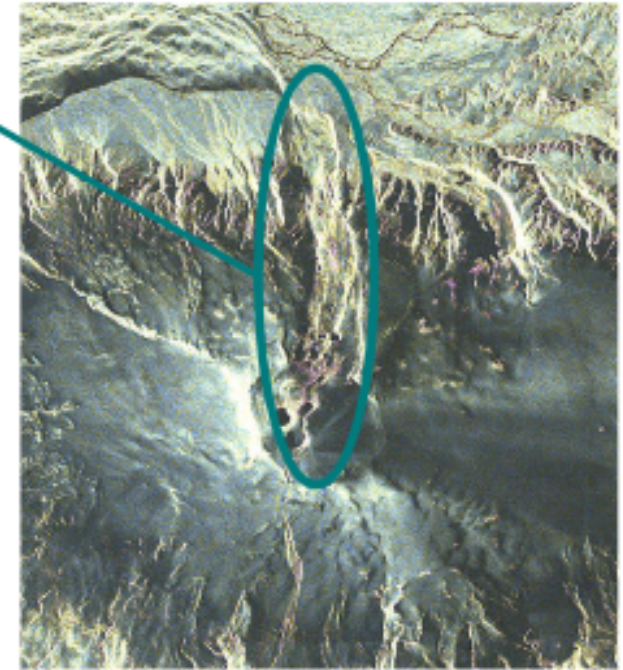
Producers of food and flowers were unable to export their goods to foreign countries so were left unsold.

Fuel was not needed for aircraft.

Flooding

The **meltwater** from the eruption also flowed down the volcano and caused flooding. Sections of the main road that circles the island were flooded.

However, trenches were dug through roads before flooding could destroy bridges. 700 people were evacuated. No lives were lost because Icelandic people are used to eruptions and are well prepared.



Make a flowchart to explain the impact of the eruption of E15. Use these images to help you.



BE6813	Cancelled
BA2939	Cancelled
LH65	

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Hotelstvedi, CC BY-SA 3.0

Task





E15 lay beneath a 200m thick layer of ice.

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Hotelstvedi, CC BY-SA 3.0

DLR, CC BY 3.0



When it erupted, the ice melted and mixed with lava. This sent up a huge cloud of ash.

EZ10550	
BE6813	Cancelled
BA2939	Cancelled
LH6517	Cancelled

No flights were allowed over Europe for over a week, which had a huge impact on the European **economy**.



Flooding meant that roads were destroyed and over 700 people had to be evacuated. ☹

L.O. To understand why we
have earthquakes and locate
major earthquakes on a map.

Flashback

How are volcanoes formed?



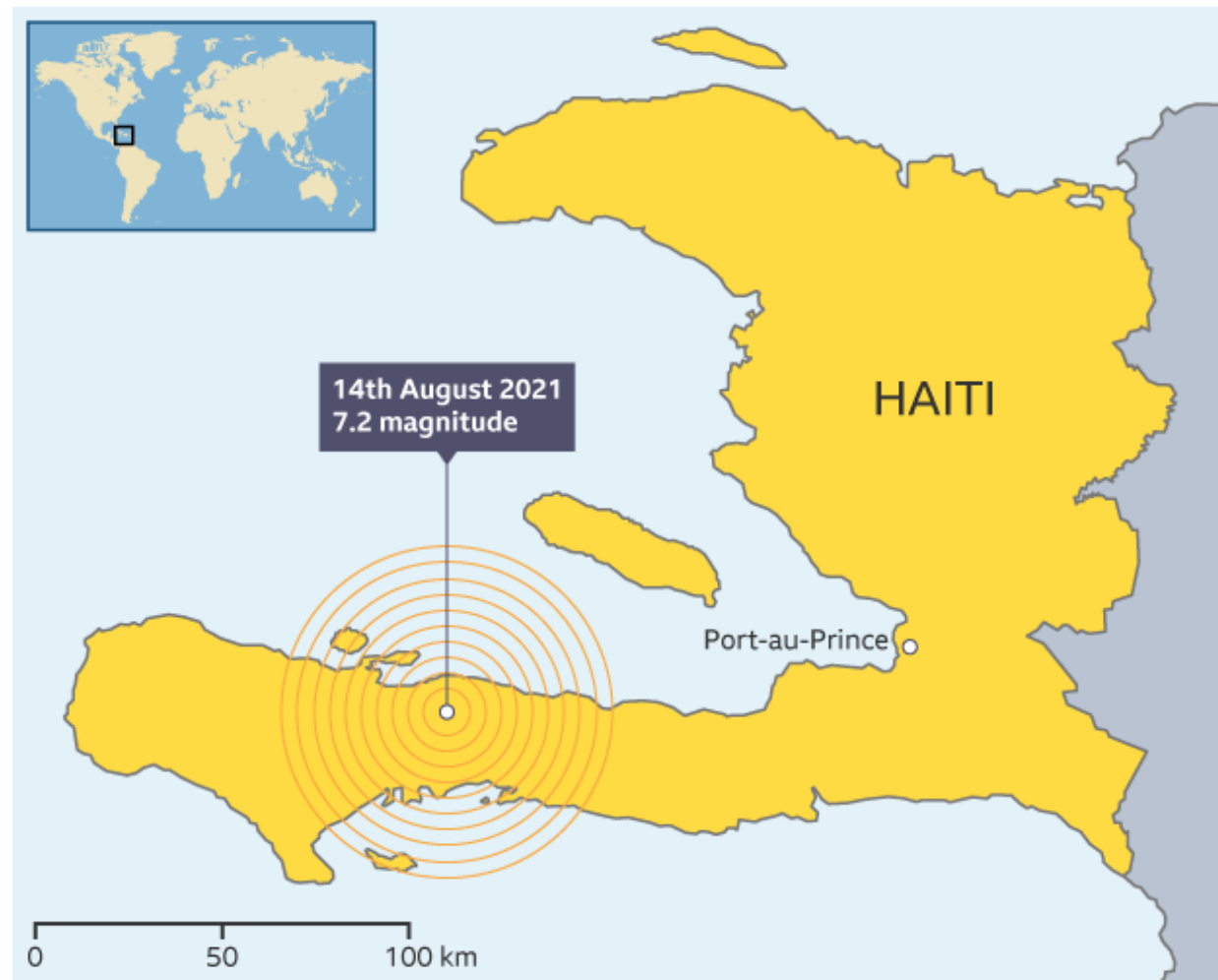


<https://www.bgs.ac.uk/discovering-geology/earth-hazards/earthquakes/>

<https://www.bgs.ac.uk/discovering-geology/earth-hazards/earthquakes/what-causes-earthquakes/#:~:text=Earthquakes%20are%20the%20result%20of,the%20ground%20surface%20to%20shake.>

<https://www.youtube.com/watch?v=oJhJD7NoTzA>

<https://www.bbc.co.uk/bitesize/guides/zgmdv4j/revision/4>



Case Study – Haiti 2021

What happened?

What were the
physical factors?

What were the
primary and
secondary
impacts?

How did the
country respond?

L.O. To describe why we have
tsunamis and discuss the
destruction they cause.

Flashback

Why do we have earthquakes?



<https://www.youtube.com/watch?v=Q-v-G1iL67w>

<https://www.natgeokids.com/uk/discover/geography/physical-geography/tsunamis/>

What is a tsunami and why do they happen?



Case Study – Indian Ocean Tsunami 2004

<https://www.youtube.com/watch?v=1UZ81D67Gf8>

Use the
Chromebooks to
help you
research.

What happened?

What caused the Tsunami?

Which countries were affected?

What was the death toll of the Boxing Day tsunami?

What was the economic impact of the Boxing Day tsunami?

What foreign aid was sent to help the victims of the Boxing Day tsunami?

Were there any physical impacts of the Boxing Day tsunami?

Assessment Piece

L.O. To create a leaflet to explain the different types of natural disaster and the destruction they cause.