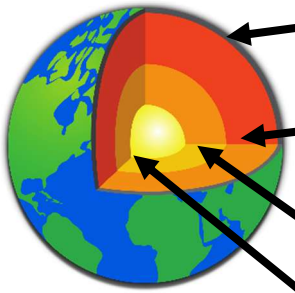
Mountains, Earthquakes and Volcanoes

Structure of the Earth



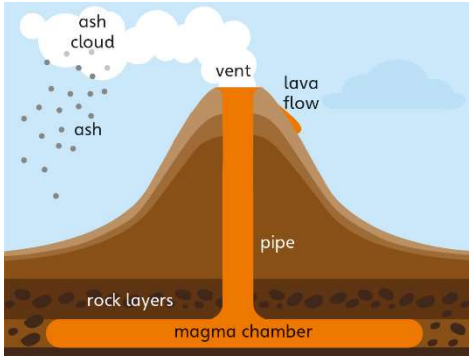
Crust
Solid rock, 0–70 km thick; continental (granite) and oceanic (basalt); made up of tectonic plates

Mantle
Solid rock, approx. 2,900 km thick

Outer Core
Liquid metal: iron and nickel; approx. 4,500°C

Inner Core
Solid metal: iron and nickel; approx. 6,000 °C

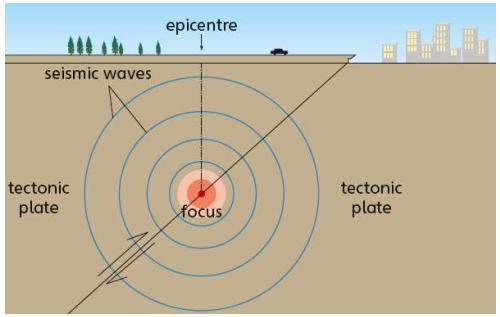
Volcanic Eruptions



Volcanoes erupt when magma rises to the Earth's surface through vents, or gaps, in the crust. Magma is made when the Earth's mantle melts, due to the movement of tectonic plates. As magma collects in a magma chamber, pressure in the chamber builds up. Eventually, this pressure forces the magma to burst up through the Earth's crust and erupt as lava.

How do Earthquakes occur?

When plates get stuck, they keep on pushing against each other. Energy builds up until the plates suddenly move past each other, and this causes an Earthquake. The point where an earthquake starts, deep in the Earth's crust, is called the focus of the earthquake. The point on the surface directly above the focus is called the epicentre.



Case Studies – Fuego Volcano and Tohoku Earthquake

Case study: The Tohoku earthquake

Location: Japan, Asia
Date: 11 March 2011
Size: 9 on the moment magnitude scale


The Tohoku earthquake was the most powerful earthquake ever recorded in Japan

Immediate effects:
- Thousands of people killed or injured
- Thousands of people missing
- Buildings and farmland destroyed


The earthquake caused a huge tsunami, which flooded the affected area

Secondary effects:
- Triggered a huge tsunami
- Tsunami flooded the area and caused damage as far as 10 km inland
- Major disruption to roads and transport links
- Nuclear power station damaged

Immediate response:
- Military aircraft used to find the areas in greatest need of help
- Roads cleared to bring in water, food, medical items and tents for those affected

Long-term response:
- Rebuild roads, railways, power supplies
- Training and education about earthquakes
- Regular safety drills (safety practice sessions)

Case study: The Fuego eruption

Location: Guatemala, South America
Date: 3 June 2018
Explosivity level: 3 (moderate)


The Fuego volcano eruption produced huge clouds of ash and gas

Immediate effects:
- Hundreds of people killed or injured
- Hundreds of people missing
- Buildings and structures destroyed

Secondary effects:
- Heavy rain caused landslides
- Crops destroyed so food supplies became limited
- Major disruption to roads and transport links

Immediate response:
- Search and rescue teams sent out to rescue people
- Roads cleared to bring in water, food, medical items and tents for those affected
- People in the area evacuated (taken to a safe place)

Long-term response:
- Rebuild roads, railways, power supplies
- New and improved emergency response systems
- Regular evacuation drills (practice sessions)

A volcanic eruption can have similar impacts to an earthquake. People can be hurt or killed, and if their local area is destroyed it can cause problems relating to money and the environment. It can cost a country many millions of pounds to recover fully and fix the damage caused by a volcanic eruption.

Year 3 Knowledge Organiser Spring One

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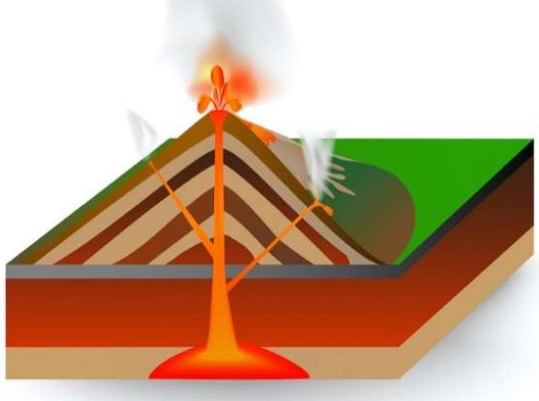
Vocabulary

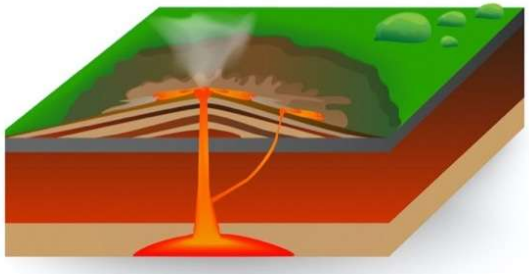
Epicentre	The point on the Earth's surface directly above the focus. An earthquake is felt most strongly at the epicentre.
Focus	The point deep underground where an earthquake starts
Fold mountain	A mountain created when tectonic plates collide and cause the plates to wrinkle upwards
Friction	A force between two things that are trying to move past each other
Lava	Magma that has reached the Earth's surface
Magma	Molten (melted) rock beneath the Earth's surface
Magnitude scale	A scale from 1–10 to measure the strength of earthquakes
Pressure	A physical force created when solid things push against each other, or when gasses build up inside something and push against the sides
Seismic waves	Waves of energy created by an earthquake that travel through the Earth
Tectonic plates	Large sections that make up the surface of the Earth

Volcanoes

Shield volcano	Largest volcanoes on Earth; wide base, low height Example: Kilauea (Hawaii) and Erta Ale (Ethiopia)
Strato-volcano	Most of the world's volcanoes are stratovolcanoes; high with steep sides Example: Mount Vesuvius (Italy) and Barðarbunga (Iceland)
Active volcano	A volcano that has erupted at least once in the last 10,000 years and still shows some signs of activity
Dormant volcano	A volcano that has erupted in the last 10,000 years but is not showing signs of activity; however, it is expected to erupt again at some point
Extinct volcano	A volcano that has not erupted in the last 10,000 years and shows no signs of activity



Stratovolcano



Shield volcano