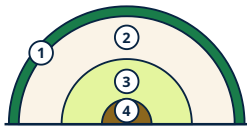


Volcanoes and plate tectonics



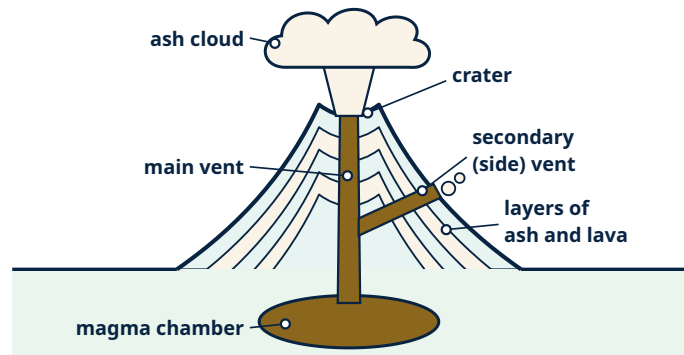
1 Layers of the Earth



- 1 **Crust:** thin and solid; thicker under continents than under oceans.
- 2 **Mantle:** the thickest layer; mostly solid rock that flows very slowly.
- 3 **Outer core:** liquid iron and nickel.
- 4 **Inner core:** solid iron and nickel.

Not to scale: the crust is drawn thicker.

2 Inside a composite volcano



3 Plate boundaries: where two plates meet



Convergent destructive

Plates move **towards** each other. The denser oceanic plate sinks under the other (**subduction**) and magma rises.

BRINGS **composite volcanoes, earthquakes**

E.G. **Mount St Helens, USA**

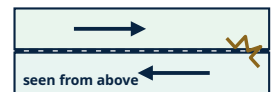


Divergent constructive

Plates move **apart**. Magma rises to fill the gap, then cools and hardens to make new crust.

BRINGS **shield volcanoes, ocean ridges**

E.G. **Iceland (Mid-Atlantic Ridge)**



Conservative or transform

Plates **slide past** each other. No magma rises, so no volcanoes. Plates stick, then slip suddenly.

BRINGS **earthquakes, but no volcanoes**

E.G. **San Andreas Fault, USA**

4 Key vocabulary

crust the thin, solid outer layer of the Earth.

mantle the thickest layer: mostly solid rock that flows very slowly.

tectonic plate a huge, slowly moving slab of crust and upper mantle.

magma molten (melted) rock below the Earth's surface.

plate boundary the place where two tectonic plates meet.

convergent (destructive) plates move towards each other.

divergent (constructive) plates move apart; magma fills the gap.

conservative plates slide past each other; crust is not made or destroyed.

lava molten rock that has reached the Earth's surface.

composite volcano steep; layers of ash and thick (viscous) lava; explosive.

shield volcano gentle slopes, runny (low-viscosity) lava, gentle eruptions.

pyroclastic flow a fast-moving current of hot gas, ash and rock fragments that rushes down the side of a volcano.

5 Key facts

- ◆ Most volcanoes and earthquakes are at **plate boundaries**.
- ◆ Plates move **a few centimetres a year**, about as fast as your fingernails grow.
- ◆ The core is **metal, not lava**; the mantle is not a sea of magma.
- ◆ Mauna Loa, Hawaii, is a shield volcano over a **hotspot** in the middle of a plate.

6 Famous eruptions

○ **AD 79**

Vesuvius, Italy: buried the Roman towns of Pompeii and Herculaneum.

○ **1883**

Krakatoa, Indonesia: a huge explosion and deadly tsunamis.

○ **18 May 1980**

Mount St Helens, USA: a huge landslide, then a sideways blast.

○ **2010**

Eyjafjallajökull, Iceland: its ash cloud disrupted air travel across Europe.

Cover, recall, check

Cover page 1. Recall from memory. Check and correct in a new colour.



NAME _____ CLASS _____ DATE _____

LEARNING GOAL**I can recall and explain the key ideas about plate tectonics and volcanoes.****SUCCESS CRITERIA**

- ☐ I can define key words such as magma and lava.
- ☐ I can explain the three types of plate boundary.
- ☐ I can label and compare volcanoes.

1 Magma and lava: what is the difference?

/2 _____

2 Name the four layers, from the outside in./1 1 _____ 2 _____
3 _____ 4 _____**3** True or false? "The mantle is a sea of liquid magma." Circle, then correct it. ☐ True ☐ False

/2 _____

4 How fast do plates move? Give a comparison.

/1 _____

5 Convergent boundary: which plate sinks? Why?

/2 _____

6 Divergent boundary: what happens? Name a place.

/2 _____

7 Conservative boundary: why are there no volcanoes?

/2 _____

8 Give two differences: composite vs shield.

/2 _____

9 What is a pyroclastic flow? Why is it deadly?

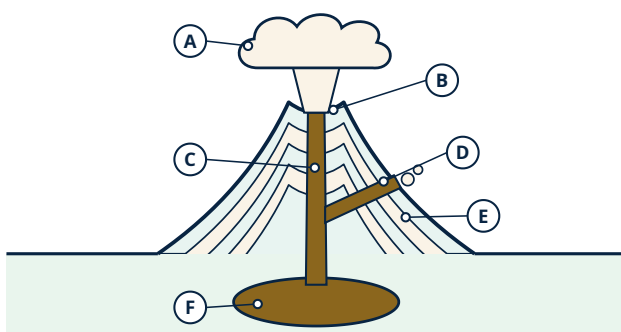
/2 _____

10 Number 1 to 4, earliest first. Circle the eruption that disrupted air travel across Europe.

- | | |
|-----------------------------------|---|
| ☐ Krakatoa | ☐ Mount St Helens |
| ☐ Vesuvius | ☐ Eyjafjallajökull |

11 Label the composite volcano

6 marks



- A _____
- B _____
- C _____
- D _____
- E _____
- F _____

PEEK LAST
 crater
 magma chamber
 ash cloud
 layers of ash and lava
 main vent
 secondary vent

**GO FURTHER** Why does Iceland have volcanoes, but the San Andreas Fault has none?

