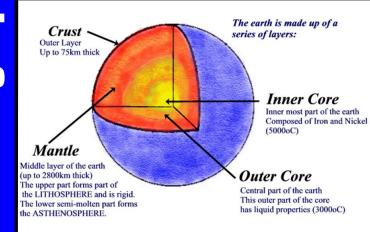
# **VOLCANOES**

### 1. STRUCTURE OF THE EARTH



### 2. PLATES AND PLATE MOVEMENTS

The earth's crust is divided into a series of plates these move on top of the mantle below.



The earth's plates move partly due to convection currents in the mantle. Molten rock is heated and becomes less dense rising towards the surface and spreading out underneath the plates moving them.

"SLAB PULL" 700 km Outer Core

As the molten rock cools it becomes dense and sinks back down.

As the plate descends into the mantle below (subducts), it 'pulls' the rest of the plate behind it, further explaining the movement — this is known as slab pull.

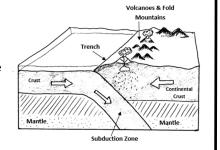
The movement of plates, carries continents on top and over time continents move position—known as continental drift

### 3. PLATE BOUNDARIES

### There are four different types of Plate Boundary:

### **Destructive**

Here two plate move towards each other - one is oceanic and one is continental e.g. Nazca Plate and South American plate – form the Andes



Constructive Oceanic Ridge e.g. Mid-Atlantic Here two plates move away from each other due to 4 convection cur-Crust rents - e.g. at the Mid-Atlantic ridge

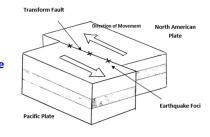
### Collision

Here two plates both consisting of continental crust collide

forming mountain ranges (no volcanoes occur here only earthquakes) - e.g. the Himalayas



earthquakes e.g. San Andreas



Fold Mountains

Continental

Two plates move together (one oceanic and one continental)

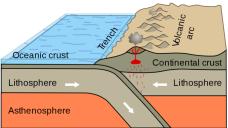
4. VOLCANO FORMATION AT DESTRUCTIVE BOUNDARIES

• The oceanic plate is denser so it goes down (subducted) under the continental plate

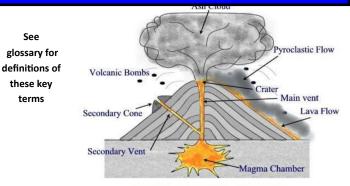
• As it is subducted the oceanic plate melts due to heat from inside the earth forming molten

 This molten rock (magma) is lighter than that around it so it rises and erupts at the surface

rock



### 5. FEATURES OF A VOLCANO

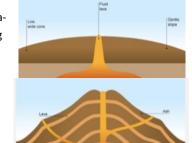


Main Features of a Volcano

### 6. TYPES OF VOLCANO

**SHIELD VOLCANOES** – these are wide based and gentle sided volcanoes formed due to faster flowing lava

**COMPOSITE VOLCANOES – these** are formed of layers of ash and lava they have a much steeper slope and narrower base and are due to lava which is slow flowing and explosive.



## **VOLCANOES MAY BE IN ONE OF THREE**



**Dormant** – a volcano that is not erupting at the moment but is expected to erupt again.

Extinct – a volcano no longer with a magma source which will not erupt again



## **VOLCANOES** continued...

### 7. VOLCANIC HAZARDS

PYROCLASTIC FLOW	– these are very fast moving avalanches of hot ash, gas and dust which can move at speeds of around 200 miles/hour and be temperatures of up to 700°C
LAHAR	these are volcanic mudflows which are formed when heavy rainfall mixes with ash
VOLCANIC BOMBS	material thrown from the volcano bigger than 64mm
LAVA	very hot molten rock which flows from a volcano
POISIONOUS GASES	sulphur dioxide and carbon dioxide are released by volcanoes – these can be very poisonous – and are a silent killer as they can't be seen but can overcome













### 8. MONITORING VOLCANOES

What measure?	Instrument?	Why?
POISONOUS GASES	Spectrometer	Rise in gases can suggest magma is rising
CHANGE IN SHAPE	Tiltmeter	Rising magma can cause a bulge in the volcano
EARTHQUAKES	Seismometer	Rising magma can trigger earth- quakes
HEAT NEAR SURFACE	Thermal Imag-	Can detect heat from rising mag-

### 9. WHY LIVE NEAR VOLCANOES?

wnat measure?		wny?
TOURISM		People can get jobs in the tourist industry—e.g. around Mt Etna—Sicily
FARMING	ġ Ą	Volcanic soils are fertile due to nutrients from ash as it breaks down—e.g. Olives near Mount Etna
MINERALS	<u></u>	Many precious minerals e.g. gold copper, sulphur near volcanoes—money earnt from mining.
GEOTHERN ENERGY	1AL - (Ö)-	Heat from underground can used to produce hot water / create electricity.

### 10. CASE STUDY — Montserrat

Montserrat is a Caribbean Island with a volcano called the Soufriere Hills

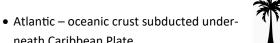


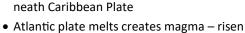
KS3 Schoology

SCAN ME

Volcanic Bomb

Cause - Destructive Boundary - Atlantic and Caribbean Plate





to feed the Soufriere Hills Volcano

• Date: 25<sup>th</sup> June 1997

### Effects:

19 people killed Capital city - Plymouth destroyed 100-150 houses destroyed About 8,000 residents left the island to live somewhere safer Airport evacuated and closed Farmland destroyed

### APPLYING YOUR KNOWLEDGE...

- How can we monitor volcanoes?
- How do volcanoes occur at destructive plate boundaries?
- Why despite the dangers do people still live close to volcanoes?

### Now Challenge yourself even further!

1. Why do you think some countries are more prepared for volcanic eruptions than others? Try and write an answer with examples.

2. Watch this YouthTED talk https://www.ted.com/talks/ joshua brown volcanic eruptions jan 2018 - choose a different volcanic eruption and try and write your own TED talk.

stay because they have always lived there and have family there.

THER	RESOURCES	5	

**BBC KS3 Bitesize - Plates** 

https://www.bbc.co.uk/bitesize/guides/zyhv4wx/revision/1 BBC KS3 Bitesize—Volcanoes





Key Term	Definition
Ash, Steam and Gas	Material erupted from a volcano—including sulphur dioxide and small rock particles.
Core	The central part of the earth
Composite Volcano	Steep sided volcanic cones made up of layers of ash and lava (also known as strato-volcanoes)
Continental Crust	Crust that consists of the earth's continents—permanent—cannot by destroyed.
Continental Drift	The movement of the earth's continents.
Crater	Bowl shaped depression at the top of a volcano containing the vent.
Crust	The outermost part of the earth (between 5-70km thick)
Earthquake	A sudden ground movement caused by a sudden release of energy
Lahar	A volcanic mudflow
Lava	Molten or semi-molten rock erupted from a volcano
Oceanic Crust	Crust found under the sea—thinner and denser than continental crust and constantly renewed and destroyed.
Magma	Molten or semi-molten rock underground
Magma Chamber	Large underground pool of magma
Mantle	Thickest part of the earth's interior (between the crust and core)
Pyroclastic Flow	Burning cloud of ash, gas and dust which travels at fast speeds down the side of a volcano
Secondary Cone	Small volcanic feature formed on the side of the main volcano by a secondary vent (often formed when main vent is blocked)
Shield Volcano	Low, gently sloping volcanoes formed by runny lava at constructive boundaries.
Spectrometer	An instrument used to measure volcanic gases
Tectonic Plate	A slab of the earth's crust that moves on the mantle below.
Tiltmeter	An instrument used to measure changes in the shape of a volcano
Thermal Imaging	An instrument used to detect heat underground
Vent	The point where volcanic material is erupted form
Volcano	An opening in the earth's crust through which molten rock

Large rock fragments thrown out of volcano To test yourself Read, cover , write, check OR try this guizlet. tiny.cc/KS3volc

reaches the surface.