

YEAR 4: SPRING 1 – SURVIVORS

GEOGRAPHY: PHYSICAL – MOUNTAINS AND VOLCANOES

UNDERSTAND, DESCRIBE AND EXPLAIN: FORMATION OF MOUNTAINS AND VOLCANOES

Physical Geography: Understanding the physical change/impact to land terrain over time: The formation of mountains & volcanoes	<i>Mountain</i>	<i>Earth's crust</i>	<i>Tectonic Plate</i>	<i>Plate boundary</i>	<i>Fold mountain</i>	<i>Fault-block mountain</i>	<i>Volcanic mountain</i>
	<i>Earth's core</i>	<i>Earth's mantle</i>	<i>Earth's crust</i>	<i>Molten rock</i>	<i>Magma/Lava</i>	<i>Convection currents</i>	<i>Converging plates</i>
	<i>Volcano</i>	<i>Erupt/ion</i>	<i>Active</i>	<i>Dormant</i>	<i>Igneous rock</i>	<i>Minerals</i>	<i>Fertile land</i>

Re-visit and revise:

Key concepts: Y3 & 4 Locational knowledge, land changing over time, rocks and soils.
Key vocabulary: hill, mountain, land-use, fertile, molten, crust, volcano, igneous rock.

What are mountains and volcanoes?

A **mountain** is a **geological landform** that **rises above** the surrounding **land**.

Typically, a mountain will rise **at least 1,000 feet above sea level**.

The **tallest** mountain in the **world**, Mount **Everest** in the **Himalayas**, rises above sea level by **29,036 feet (8,848m)**.

Small mountains (**below 1,000 feet**) are usually called **hills**.

THINKING POINT:

What is the difference between a mountain and a hill?



How are mountains and volcanoes formed?

Mountains are most often **formed** by **movement** of the **tectonic plates** in the **Earth's crust**.

The Earth's surface – **the crust** - is made of different sections called **plates** (like a **cracked egg shell**).

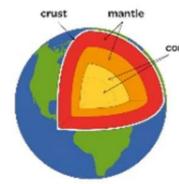
Tectonic plates are pieces of the **rocky outer layer** of the **Earth** known as the **crust**.

These plates are **constantly moving**, and volcanoes, earthquakes and sometimes mountains are found at the plate boundaries.

Tectonic plates move very **slowly**. It can take **millions and millions of years** for mountains **to form**.

There are **eight major plates**: Eurasian, Pacific, IndoAustralian, Antarctic, Nazca, North American, South American and African.

Great mountain ranges, like the Himalayas, often form **along the boundaries** of these **plates**.



THINKING POINT:

What are the names of the eight major tectonic plates of the Earth's crust?



The **Earth's plates** are **constantly moving**; on average, this movement is **between 1 and 10 cm per year**.

Convection currents in the **mantle** cause the **tectonic plates to move**.

The **mantle** is made of **molten rock (magma)**. As the **magma** moves, so do the plates above.

Occasionally, two **plates move closer** to each other, or **converge**; this creates **intense pressure**, causing the **plates to buckle and form a mountain**.

Fold mountains, **fault-block** mountains **and dome** mountains are generally **formed** within the **main body of the plate** (central).

Volcanic mountains are generally formed on the **plate boundaries**.

THINKING POINT:

What is it that causes the plates to move?

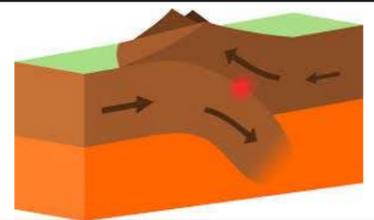


What are the different plate boundaries?

Destructive plate boundary:

At a **destructive plate boundary** (also called **convergent** boundaries) two **plates** move **towards** another. One plate is then **pushed underneath** the other. (It is the **heavier plate** that is **forced beneath** the lighter plate). The **point** at which one plate is **forced beneath** the other is called the **subduction zone**. The **plate** then **melts** to become **molten rock (magma)**. The **magma** then **forces** its way up to the plate boundary to **form a volcano**.

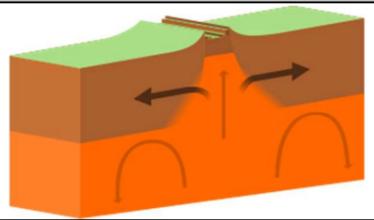
Example: Eurasian plate and Pacific plate where over 400 volcanoes are formed – most underwater.



Constructive plate boundary:

Constructive plate boundaries (also called **divergent** boundaries) **move apart** from each other. As they **move apart**, **molten rock (magma)** rises from the **mantle**, then **cools** and **hardens** to form new rock.

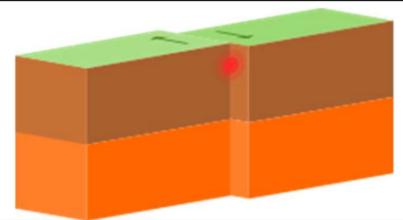
Example: Eurasian plate and North American plate (Iceland)



Transform plate boundary:

At **transform plate boundaries** two **plates move past each other**.

Friction (rubbing) may **cause them to stick**. But, when they eventually **become unstuck**, often with a **violent jolt**, an **earthquake** results.



THINKING POINT:

What are the three different types of plate boundary and what are the main differences between them?

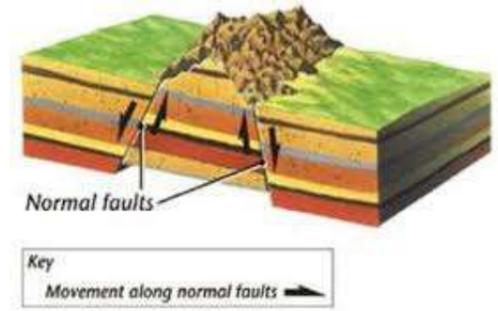


Learning links:
Geography:
Y6: Earthquakes Earth's crust/ Tectonic plates/ Plate boundaries/ Fault lines
Learning links:
Science:
Y3: Rocks Magma/Molten/ Igneous/ Minerals

What are the different types of mountains that can be formed?

FOLD MOUNTAINS: are the *most common* type of *mountain*.

As *two plates* move *towards* each other they *buckle* and the *crust pushes upwards*, forming a *mountain*. Fold mountains are generally formed between 40-50 million years ago, which is geologically-speaking, young. They are often *high with steep faces*. *Examples* of fold mountains include The *Himalayas*, The *Andes*, The *Rockies* and The *Alps*.

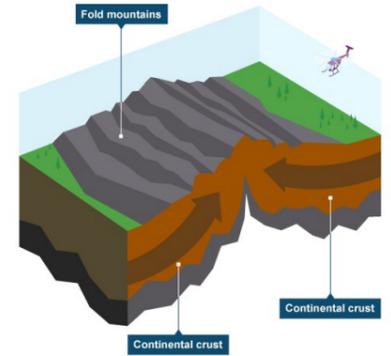


FAULT-BLOCK MOUNTAINS: are *formed* when *two plates* move *towards each other*.

Rather than the crust folding under the pressure of the moving plates, it *cracks along lines of weakness* called *fault lines*.

The *crust* then *breaks into blocks*, some of which are *pushed upwards* to *form mountains* or *downwards* to *form valleys*.

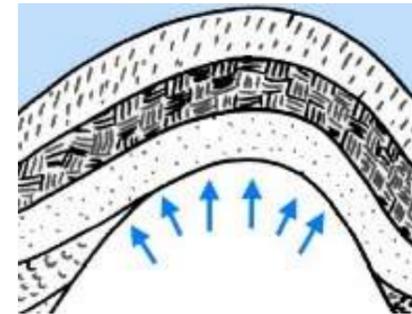
An example of a fault block mountain range is the *Sierra Nevada* in Eastern *California, USA*.



DOME MOUNTAINS: are the *result* of a great amount of *molten rock (magma)* pushing its way *up* under the Earth's crust.

Without actually *erupting* onto the surface, the *magma pushes up* the *crust* which then *bulges upwards*. Eventually, the *magma cools* and *forms hardened rock*.

An example of a dome mountain range is the *Black Hills* in *South Dakota, USA*.



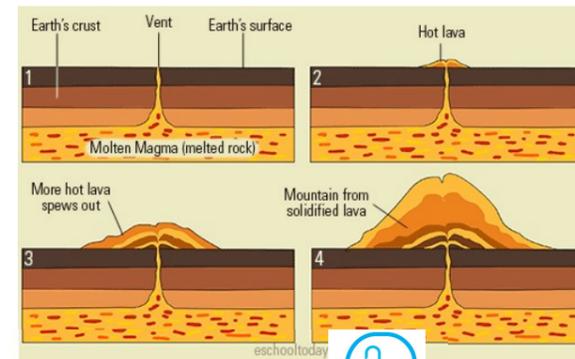
VOLCANIC MOUNTAINS: are *formed* when *molten rock (magma)*, deep within the earth, *erupts* and *piles upon the surface*.

Magma is called *lava* when it *breaks through* the earth's *crust*.

When the *ash and lava cools*, it *builds a cone of rock upon the crust*.

Over *long periods of time* and *multiple eruptions*, rock and lava *pile up, layer on top of layer* to *form a mountain*.

Examples of volcanic mountains are *Mt. Vesuvius* in *Naples, Italy*, *Mt. Etna* in *Sicily, Italy* and *Mt. St. Helens* in *Washington, USA*.



THINKING POINT:

What are the four main types of mountain and can you explain how are they formed?



KEY ASSESSMENT QUESTIONS AND SCENARIOS:

EXS:	GDS:
How are mountains and volcanoes formed? What is the difference between the two? Describe and explain this process with diagrams and technical vocabulary.	How do volcanoes change the surrounding land and how do humans benefit from this?

FIELDWORK IN THE LOCAL AREA – OBSERVE, MEASURE, RECORD AND PRESENT:

Traffic survey: Report the traffic conditions of surrounding roads	Ask questions/find problems and plan ways of finding answers or solutions	Design a survey format to collect answers systematically and accurately	Represent the data and find answers (tables, graphs)	Present the findings to others and how this impacts the local area	Plan for action – what would support change?
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LOCATIONAL KNOWLEDGE – USE RESOURCES TO LOCATE:

Globe:	The 7 continents	The 5 Oceans	Major seas	2 poles	The Equator	The Tropics
Atlas: (4 point grid reference)	Locate specified countries within Europe and their capital cities	Locate Italy and its major cities		Locate major rivers, seas, mountains and volcanoes of Europe (Physical)	Locate major man-made areas of interest of Europe (Human)	
OS Map (Dorset):	Locate towns and villages of Dorset	Plan a trip from Ocean Academy around Poole to pass/see local areas of interest			Use the key and some OS symbols to locate areas of interest in Poole	
			Sch			
		Church	School	Viewpoint	Museum	Country park

Compass: Use N, NE, E, SE, S, SW, W, NW to give and follow simple directions to reach a chosen destination in close range. Begin to use the 'direction of travel arrow' and 'rotating dial' on the compass to follow directions (e.g. Walk 20 steps North East).

