

Formation of volcanic features| sample answer

Q: 'Explain the processes that have led to the formation of any two volcanic landforms' (2006 Q3 C.)

Molten rocks (magma) from the mantle forces its way through weakness in the crust (faults, plate boundaries and rifts) towards the surface because of plate tectonics (convection currents).

When magma cool under the surface it forms intrusive features. These features only become visible when the surface rock layers are weathered/eroded when the surface rock layers are weathered/ eroded (denudation) away. eg Granite- slow cooling, big crystle.

Intrusive volcanic features include dykes, sills, laccoliths, laccolith and the greatest intrusive feature; Batholith.

A batholith is a large mass of igneous rock (granite) hat formed as magma from the mantle pushed (intruded) into the crust.

It then, after thousands of years cools and solidifies. Batholiths are up to 20k deep and in Ireland there is a huge granite batholith formed 400m years ago during the 'Caledonian fold mountains building period'.

When the magma cooled inside the folded rocks, the heat metamorphosed the rock above it, forming a metamorphic aureole around it.

Then this metamorphic rock gets weathered and eroded, leaving mounds of granite on the surface eg wicklow mountains.

Volcanic features found on the earths surface (external features) are caused by lava emerging from the mantle through the crust and cools when it reaches the surface. These features include; lava plateau, craters and calderas, volcanic plugs and the main feature; **volcanic cones**.

Volcanic cones are extrusive volcanic landforms. They form when magma rises from the mantle and forces its way to the surface through a weakness (vent) in the crust.

When magma reaches the surface, a volcanic eruption occurs, gradually forming a volcanic cone. There are many types of cones depending on their shape and their constituents. These include;

Dome Volcano; These are also known as acid lava cones.

They are made of thick, silica rich, acidic lava. The lava does not flow far because of the consistency of the lava, so therefore the cones are tall, steep and convex eg Mount Pelee.

Shield Volcano; they are also called basic lava cones. Contrasting the dome volcano the lava that emerges is thin, runny, iron and magnesium rich.

This lava has a lower melting point aswell so it so it flows further, also a great amount comes out when it erupts

This makes the cone more convex with gentle slope and is very high because of the amount of lava. eg. Mount Loa, Hawaii.

When ash and cinder burst out in an eruption the cinders float to the bottom and the ash floats away. This creates a steep concave ash and cinder volcano. eg Mount St. Helen's in western USA