

Earthquakes and Volcanoes | Sample Answer

Intrusive and extrusive features formed by volcanic activity on the Irish landscape. (2017 Q1)

A lava plateau is an extrusive feature of volcanic activity that forms on the Irish landscape. Sills, dykes and batholiths are intrusive plutonic landforms that have been developed by volcanic activity. Extrusive features are surface landforms whereas intrusive features form from inside the earth.

A lava plateau is a steep-sided, flat topped basalt upland that covers a large land area. It is formed from volcanic eruptions of basic lava that pours from fissures in the crust. During each eruption, the lava flows out, solidifies and builds up layer upon layer each time. Basic lava has less than 55% silica so it has very few trapped gases. The lava is very fluid and runny allowing the gases to escape easily. Examples of lava plateaux include the Antrim Plateau in Co. Antrim. It was formed at a constructive plate boundary 60 million years ago. When the plates began to move apart, the landscape would have resembled present day Iceland. The earth's crust was stretched and huge fissures formed that basic lava flowed out of. These lava flows continued for 2 million years producing an 1,800m high lava plateau. The lava flows cooled to form basalt, a dark coloured, fine-grained rock which is resistant to weathering and erosion. As the lava cooled and contracted, the basalt formed polygonal columns. At the Giants Causeway, the columns are hexagonal, and an important tourist attraction in the region.

Plutonic landforms occur beneath the earth's surface when magma cooled and hardened into rocks, but they are visible today as weathering and erosion have removed over-lying rock. A batholith is a large mass of granite that formed as magma from the mantle pushed into the crust, and cooled and solidified over thousands of years. An Irish example of a batholith is the Leinster Batholith in the Wicklow Mountain range, a granite batholith which formed 400 million years ago during the Caledonian fold mountain building period. Magma was injected and cooled inside the folded rocks. Heat from the magma metamorphosed the overlying rock forming a metamorphic aureole around the batholith. Weathering and erosion removed the rock above so that we can see the exposed batholith as a low, rounded granite mountain today. Sills form as magma pushes its way between layers of rock, then cools and solidifies as large, flat areas of igneous rock e.g. Fair Head, Co. Antrim.

Dykes form as magma forces its way across rock layers, cools and solidifies. They are walls of basalt or granite running perpendicular to the rock layers. They are very common in volcanoes

where magma forces its way through fissures in the cone, and then cools. E.g. Basalt dyke in Newry, Co. Down.