

Global Distribution of Volcanoes | Sample answer

Examine how the tectonic cycle helps to explain the global distribution of one of the following: • Volcanoes

Volcanoes' geographical locations can be where plates collide and diverge. However, sometimes they can be found in the middle of plates at hotspots far from any plate boundary. There are about 120 known hotspots in the world. A hot spot is when a narrow column of extra hot molten magma, called a plume, rises up towards the earth's crust. The crust becomes weakened by the pressure of the rising magma and forces its way up to the surface. This kind of volcanic activity causes volcanic island to form such as the Hawaiian islands. An example of such a volcano would be Mauna loa on the main island of Hawaii which is still active. In time, the plate will move over the area of the hot plume and new volcanoes will form. The old ones will eventually become extinct as the plate continues to move away.

The crust is broken up into huge slabs of rocks called plates, there are seven major plates and several minor plates. The plates float on semi-molten rock of the lower mantle and are moved around by slow but powerful convection currents of magma beneath them. Constructive plate boundaries occur where plates separate and new crust is formed. Volcanoes can be found here. As the plates separate, cracks and fissures occur within the crust. Super hot (1000 degrees), basic lava with a low silica content emerges and flows out quickly over a large surface, often creating shield volcanoes. As the American plate diverges from the Eurasian and African plate, the magma builds up a mid-atlantic ridge. These plates are continuously separating and volcanic activity is constantly heightening the volcanic mountains. Many of these mountains have been heightened so much they are now islands. Iceland is an example of such. Iceland is 18-20 million years old and has the active volcano St. Helens.

Volcanoes also occur at destructive plate boundaries, where two plates collide and crust is destroyed as a result. On the western edge of South America, the continental South American plate collides with oceanic Nazca plate. The heavier oceanic plate pushes under the lighter continental plate in the process of subduction. As the oceanic plate begins to be forced into the mantle it begins to melt. The now melted plate is still under tremendous pressure, and it forced into the mantle until it is forced to the surface. Th volcanic eruptions are violent as the acidic lava

has a high silica content as well as many trapped gases and streams within it. However, this liquid cools very quickly and does not spread out quickly, it forms many cone shaped volcanoes. For example, the Licanbars near the west coast of America.

Where the oceanic Pacific plate subducts under the oceanic Atlantic, a horse shoe shaped zone 40,000 km long of volcanoes forms . It is called the pacific fire. It has 452 volcanoes, with 75% of the world's active volcanoes.