

Year 10 Geology

Geology is the study of the formation of rocks and their make up, as well as the Earth's crust.

The Earth's Plates

The Earth's crust is made up of large pieces called plates. There are seven or so main plates. These are:

- ☐ The Australian/Indian Plate
- ☐ The Pacific Plate
- ☐ The Antarctic Plate
- ☐ The Eurasian Plate
- ☐ The North American Plate
- ☐ The South American Plate
- ☐ The African Plate

These plates form one layer of the Earth. The other three are the Mantle, the Outer Core, and the Inner Core.

The plates can move in three directions in relation to each other; past each other, away from each other and towards each other. When plates move away from each other, magma (molten rock) rises up and fills the gap left behind, creating mid-ocean ridges. The further away from the ridge, the crust is, the older it is. When plates move, certain geological events may occur on the boundaries:

- ☐ Faulting + folding,
- ☐ Mountain Formation
- ☐ Earthquakes
- ☐ Volcanoes
- ☐ Subduction Zones

Earthquakes

The movement of the plates causes the rock layer to bend and squeeze at the edges (boundary). This puts tremendous pressure on the rocks, and the rock

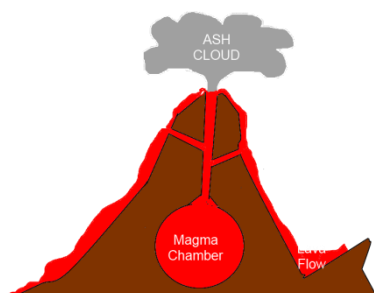
layer will crack and move. This crack in the

Earth's crust is called a fault line. The breakage of rocks, and movement that follows will cause an earthquake. The red dot is the focus of the earthquake; the exact point of origin, while the blue dot is the epicenter, the spot on the surface directly above the focus. This diagram shows a stress fracture, because of the way the plates are moving (past each other).



Volcanoes

This volcano diagram is the only thing about volcanoes you have to remember. Volcanoes generally form on subduction zones, when one plate folds under the other. This shows that the volcano is formed by the buildup of pressure in the Earth because of trapped



magma, that it forms vents to get out, and it usually produces an ash cloud. Lava also flows down the mountain. This lava cools to form Basalt, an igneous rock.

Types Of Rocks

There are three types of rocks; sedimentary, metamorphic and igneous rocks.

Igneous Rocks: Formed in the cooling and solidifying of molten rock (magma), as is formed in a volcano. Eg. Basalt, Scoria, Pumice.

Sedimentary Rocks: Formed when rock fragments/pieces are deposited in layers, often underwater. They are then subjected to high pressure. Eg. Sandstone, Mudstone, Limestone.

Metamorphic Rocks: Formed when rocks (igneous, metamorphic) are subjected to high pressure, and heat, over a long period of time, without melting. Eg Schist, Gneiss, Marble.

Rock Samples:

Name	Type	Description
Pumice	Igneous	Easy to scratch, white, textured, light
Quartz	Igneous	Hard to scratch, cream, textured/smooth, heavy
Scoria	Igneous	Hard to scratch, black, textured w/ holes, light
Basalt	Igneous	Hard to scratch, black/grey, smooth, heavy
Sandstone	Sedimentary	Shell-like, hard, grey, hard to scratch
Mudstone	Sedimentary	Grey, smooth, layered, easy to scratch
Schist	Metamorphic	Shiny, layered, grey, hard to scratch
Slate	Metamorphic	Grey, hard, thin, light, hard to scratch
Marble	Metamorphic	Hard to scratch, heavy, white, smooth

The Rock Cycle

The rock cycle is a cycle that rocks go through to change their appearance, texture and form from one type of rock, to another. This generally takes millions of years. This diagram illustrates the processes clearly.

However; this can be summarised:

- ☐ To form Igneous rocks, a rock is required to melt.
- ☐ To form Sedimentary rocks, a rock is required to break apart and cement together.
- ☐ To form metamorphic rocks, a rock is required to be placed in extreme heat and pressure without melting.

