

Study notes for Geography topic Rocks and volcanoes

Hello guys, today in geography section we will be studying about rocks, volcanoes and their types. So, let's discuss about it.

Rocks

Geology is the study of rocks and **Geologists** are the people who study them. Rocks are said to be a solid mineral material. It is a large piece of rock that has become detached from a cliff or mountain. It forms part of the surface of the earth and other similar planets. Each rock has varying minerals which is why there are so many different ones. Some of the most well-known minerals are **calcite, quartz, olivine and mica**. Minerals are made naturally in the Earth and are made from chemicals. There are majorly three types of rocks:

Igneous rocks

Igneous rocks form when hot, molten rock crystallizes and solidifies. The melt originates deep within the Earth near active plate boundaries or hot spots, then rises toward the surface. Igneous rocks are divided into two groups depending upon where the molten rock solidifies:

Intrusive igneous rocks: They are also called plutonic rocks. This type of igneous rock is formed when magma is trapped deep inside the Earth. When the huge globs of molten rock rise toward the surface, some of the magma comes on the Earth's surface, but most remain trapped below, where it cools very slowly until it solidifies. Slow cooling means the individual mineral grains grow to a relatively large size. Intrusive rocks have a coarse-grained texture. For example - diorite, gabbro, granite, pegmatite, and peridotite.

Extrusive igneous rocks: They are also called volcanic rocks. They are produced when magma exits and cools above (or very near) the Earth's surface. They form active volcanoes and oozing fissures. The magma, called lava, is produced but solidifies when it experiences a relatively cool atmosphere. Quick cooling means that these rocks have a very fine-grained or even glassy texture. For example - small crystals.

Sedimentary rocks

Sedimentary rocks are formed from pre-existing rocks or pieces of once-living organisms. The most important geological processes that lead to the creation of sedimentary rocks are erosion, weathering, dissolution, precipitation, and lithification. Such rocks are characterized by the presence of distinct sediments or layers in them. Some examples of sedimentary rocks are limestone, shale, conglomerate, clays, quartz and dolomite are the common dominant minerals. They can be divided into 3 categories:

Common sedimentary rocks - include sandstone, limestone, and shale. These rocks often start as sediments carried in rivers and deposited in lakes and oceans.

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Clastic sedimentary rocks - are made up of pieces (clasts) of pre-existing rocks. Pieces of rock are loosened by weathering and then transported to some basin or depression where sediment is trapped. Clastic sedimentary rocks may have particles ranging in size from microscopic clay to huge boulders.

Biological sedimentary rocks - They are formed from the dead & decaying matter of living organisms. Chert is an example of this type of rock. Limestone is formed from this.

Metamorphic rocks

These are formed when igneous & sedimentary rocks are subjected to intense heat and pressure and are influenced chemically by active gases. Important metamorphic rocks which take part in the weathering process are formed from shale' marble (formed from limestone), schist (formed from shale) and quartzite (from sandstone). Dominant minerals are quartz, clays and calcite. The parent rock can be either sedimentary, igneous, or even another metamorphic rock. The word "metamorphic" comes from Greek and means "To Change Form".

Volcanoes

A volcano is defined as a vent or fissure in the planet's crust through which lava, ash, rock and gases erupt. A volcano is also a mountain formed by the accumulation of these eruptive products. Hawaii's **Mauna Loa** is the largest active volcano on our planet. Rising gradually to more than 4 km (2.5 m) above sea level. Geologists generally group volcanoes into four main kinds:

- 1. Composite Volcanoes:** They are also called stratovolcanoes. They are typically steep-sided, symmetrical cones of large dimensions built of alternating layers of lava flows, volcanic ash, cinders, blocks, and bombs and may rise as much as 8,000 feet above their bases. For eg: Mount Fuji in Japan, Mount Cotopaxi in Ecuador, Mount Shasta in California, Mount Hood in Oregon etc.
- 2. Cinder cones:** They are the simplest type of volcano. They are built from particles and blobs of congealed lava ejected from a single vent. They are numerous in western North America.
- 3. Shield volcanoes:** They are the third type of volcano, and are built almost entirely of fluid lava flows. They are built up slowly by the accretion of thousands of highly fluid lava flows called basalt lava. Kilauea and Mauna Loa on the island of Hawaii— two of the world's most active volcanoes.
- 4. Lava domes:** They are formed by relatively small, bulbous masses of lava too viscous to flow to great distance. They commonly occur within the craters or on the flanks of large composite volcanoes. For eg: Mont Pelée in Martinique, Lesser Antilles, and Lassen Peak and Mono domes in California.

Important volcanoes of the world



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- **Mauna Loa, Hawaii:** It is the biggest volcano on Earth. It is 9,170 meters tall. It is a shield volcano. Mauna Loa is a hot spot in the Pacific plate.
- **Mount Fuji, Tokyo, Japan:** It has a symmetric cone. It is an active volcano and is a stratovolcano. It is 3,776 meters tall. It is the tallest peak in Japan.
- **Mayon Volcano, Albay, Philippines:** It is an active stratovolcano. It has steep slopes that form a symmetrical classic volcano. It is 8,081 feet tall.
- **Mount St. Helens, Washington, USA:** It erupted in 1980 and was one of the most devastating eruptions in the USA. It is an active stratovolcano. It's 8,366 feet tall.
- **Popocatepetl Volcano, Mexico:** It is one of the most active volcanoes in Mexico. Popocatepetl means Smoking Mountain. It is an active stratovolcano and is 5,426 meters tall.

Hope you liked the blog and any doubts related to this topic are clear.

