VULCANICITY

This is a process through which molten rocks (magma) are either intruded within the earth's crust or extruded onto the earth's surface.

Vulcanicity is aided by the process of faulting which forms cracks in the earth's crust through which magma escapes.

When magma is intruded within the earth's crust, it cools down and solidifies to form intrusive volcanic features e.g. batholiths, sills, dykes, lapolith and laccolith.

When magma is extruded onto the earth's surface, it changes to lava leading to the formation of lava plateaus, calderas, craters, hot springs, steam fumaroles and geysers.

Types of Lava:

They are three types namely;

Acidic lava.

This is magma or lava that is rich in silica (above 66%) flows for a short distance from the point of eruption. The lava is highly viscous (thick and sticky) and solidifies even at hot temperatures. It is immobile and therefore it builds steep cones.

Intermediate lava.

This flows at an intermediate distance from the point of eruption (vent).

Basic lava.

This is magma or lava that has low silica content (below 40%) flows for a long distance from the point of eruption. It has low silica content and highly mobile, therefore it builds up gently sloping cones, lava plateau and plains.

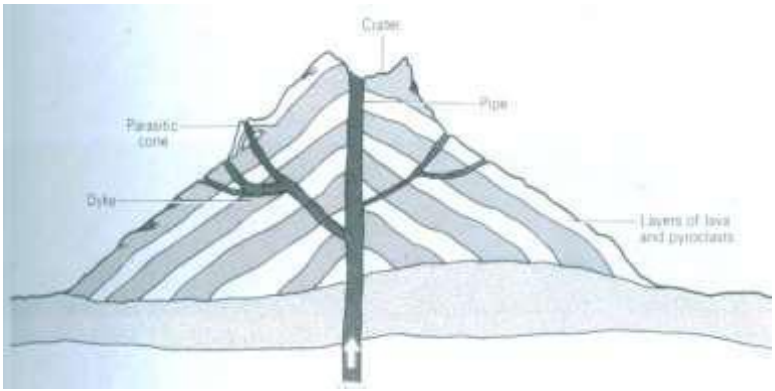
Extrusive features:

These are formed as a result of lava solidifying on the earth's surface. The features formed include;

Volcanoes: They are formed as a result of subsequent eruptions through which magma is ejected onto the earth's surface.

These volcanoes are mainly made up of alternating layers of ash and lava/cinder hence they are also called **composite cones**

or ash and cinder cones e.g. mountain Kilimanjaro, Muhavura and Mt. Kenya.



Formation of composite volcanoes

These are formed as a result of volcanic eruptions leading to the extrusion of ash and cinder/lava at different intervals. With time, ash and Cinder cones develop parasitic cones e.g. Kibo and Mawenzi peaks on Mt. Kilimanjaro.

N.B. Volcanoes are grouped according to their present states.

There are three types of volcanoes i.e.

Active volcanoes.

These are volcanoes which have erupted in recent years and still show signs of eruption e.g. Muhabura/Muhavura(Mufumbiro ranges), Oldoinyo Lengai, Mt. Longonot.

Dormant volcanoes.

These have never erupted but still show some signs of eruption e.g. Mt Kilimanjaro, Mt Kenya and Mt. Elgon.

Extinct volcanoes.

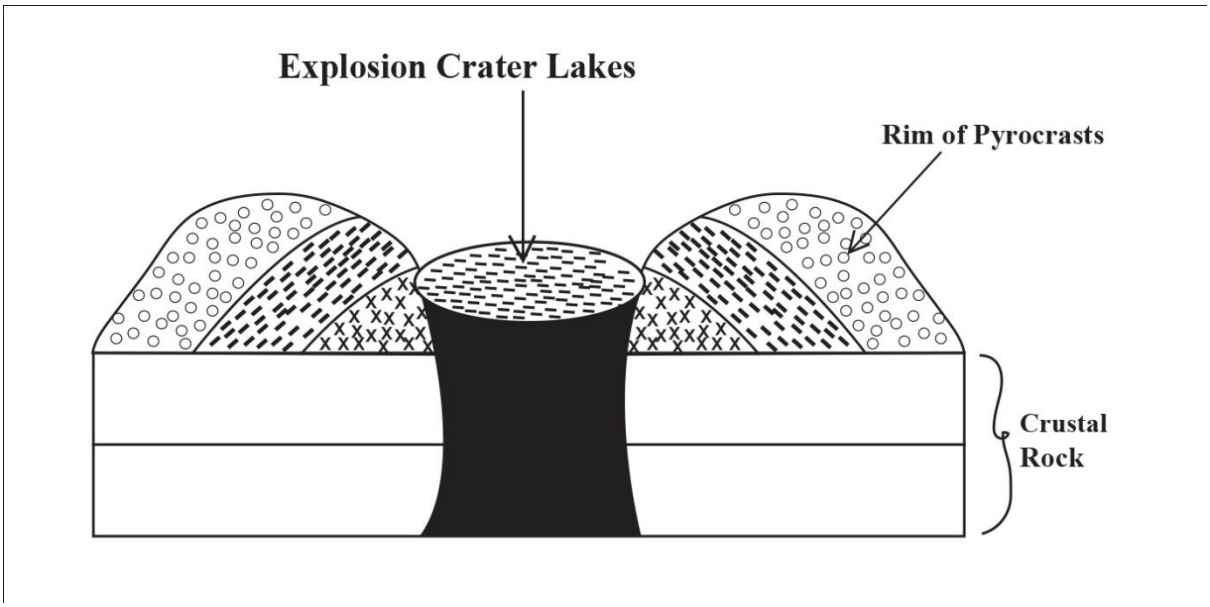
They are volcanoes that have ever erupted and show no signs of further eruptions and the original shape of the mountain has been destroyed/modified by denudation processes e.g. Mt. Moroto.

Crater:

This is a shallow and funnel shaped depression found on top of a volcanic mountain after a violent eruption. It's formed as a result of magma cooling in the vent without subsiding /sinking back to the magma chamber. When a crater is filled up with water, it becomes a crater lake (Explosion crater lake) e.g. Lake Katwe,

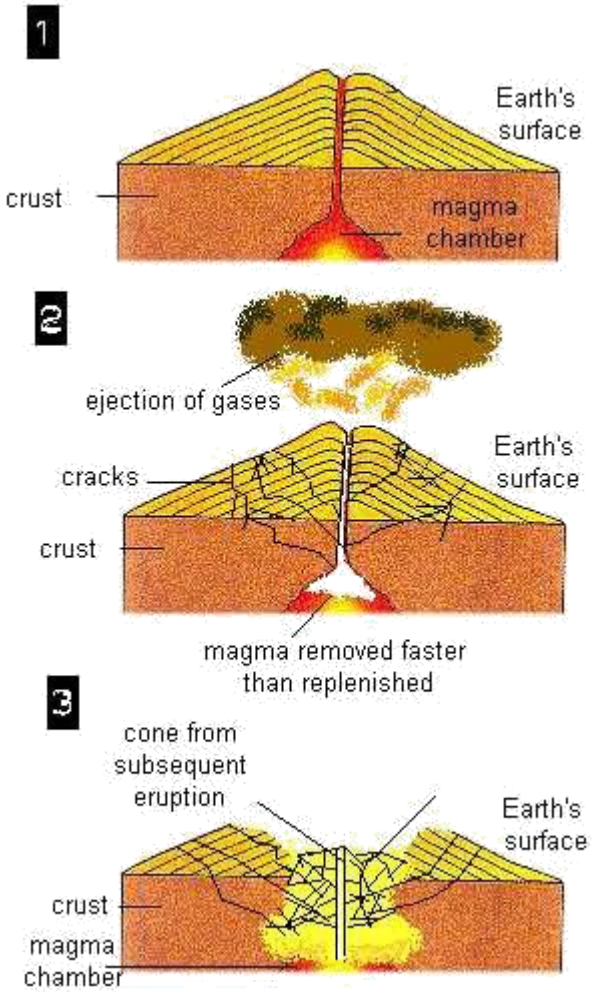
Lake Kyamwiiga, L. Nkugute (Rutooto), L. Munyanyange, L. Nyamunuka, L. Nyungu and L. Nyamusingiri.

Many explosion craters are found in Mt. Rwenzori National park acting as tourist attractions.

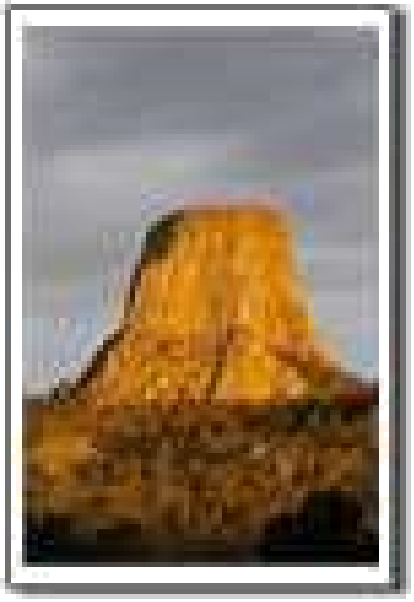


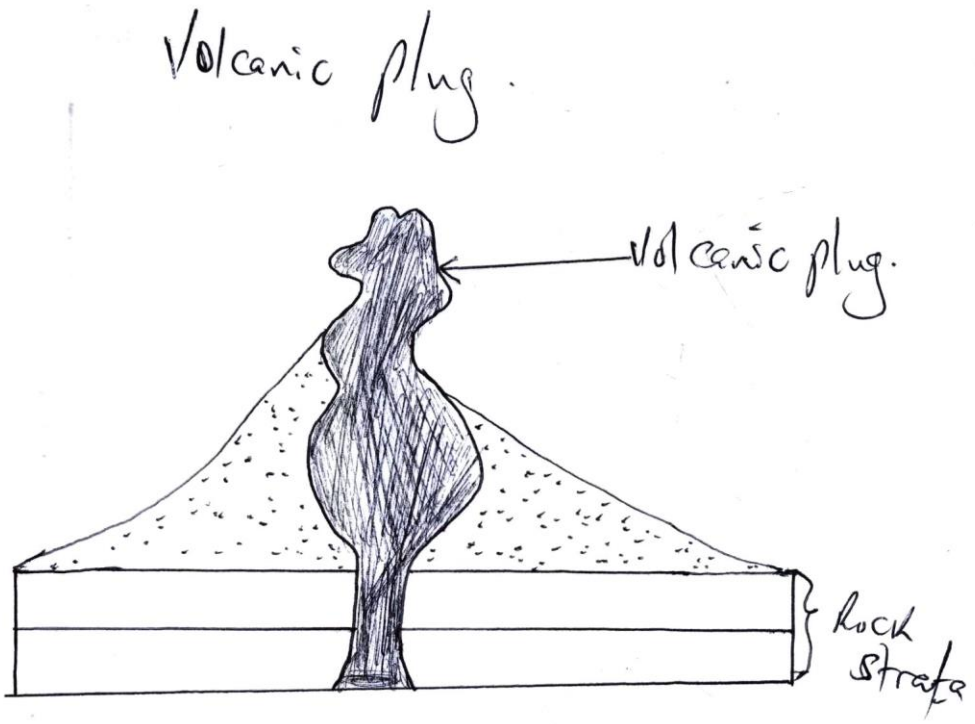
Caldera: This is a large and rounded shallow depression on top of a volcanic mountain. It's formed when violent explosions blow off a mountain top with a crater leaving behind a large and rounded shallow depression. Examples in East Africa include; Ngorongoro, oldoinyo Lengai, Napak and Longonot.

Illustration of a caldera

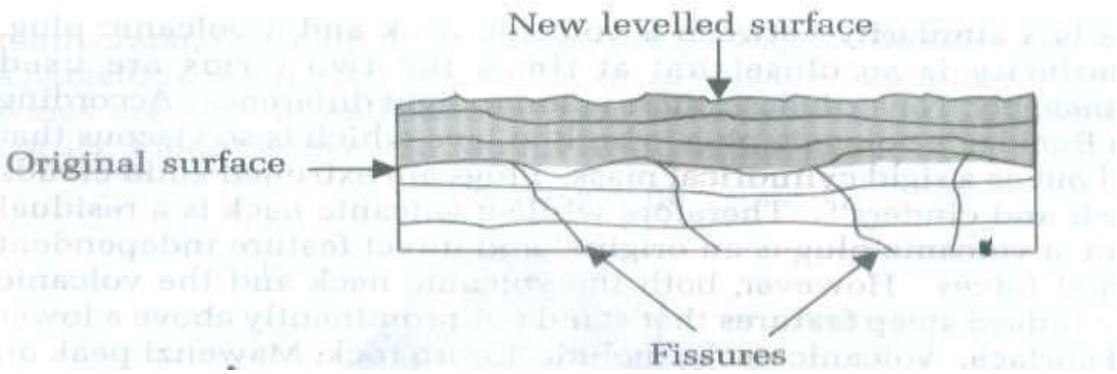


Volcanic plug: It's also known as a volcanic neck. It's formed when magma solidifies and cools in the vent. It's then exposed as a result as of erosion leaving behind a hard and resistant rock e.g. Tororo rock and Mwadui plug.





Lava plateau: It's an extensive upland formed as a result of ejection of lava through many vents e.g. Kericho plateau, Yatta plateau,



Nyika plateau, Aberdare ranges, Kaputiel plains and Kisoro plains.

(f) Geysers and hot springs:

These are formed through ejection of hot water and steam from the underground water aquifers. Examples in East Africa include;

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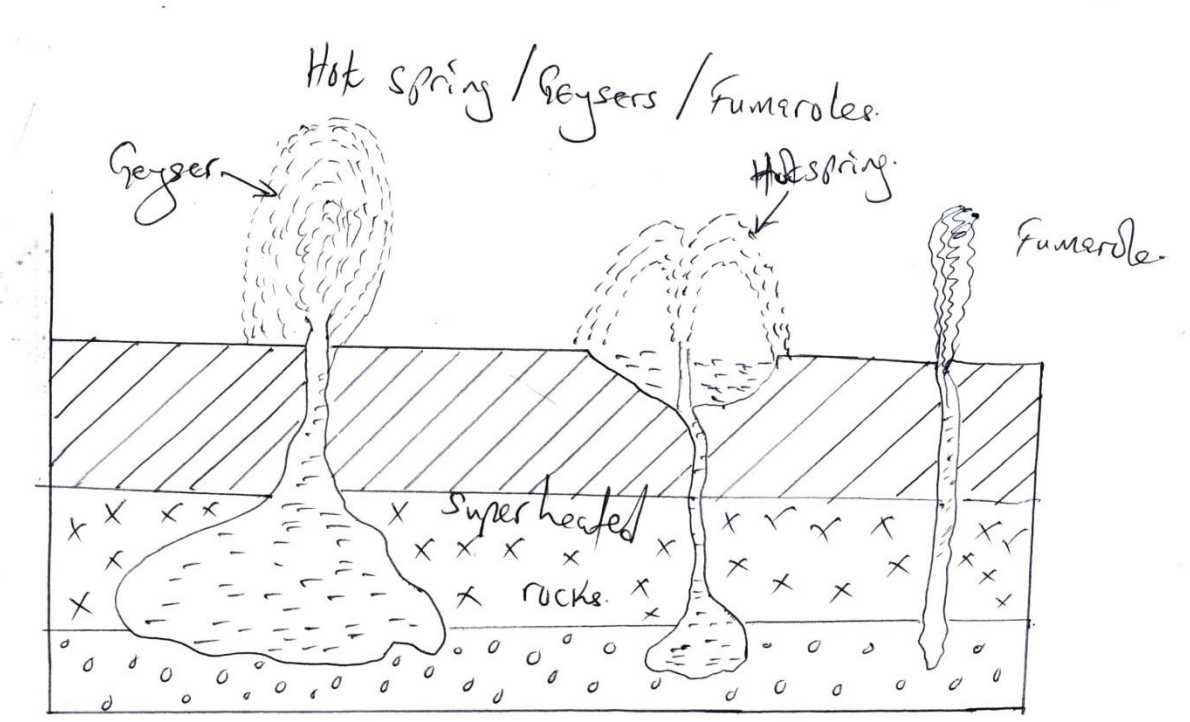
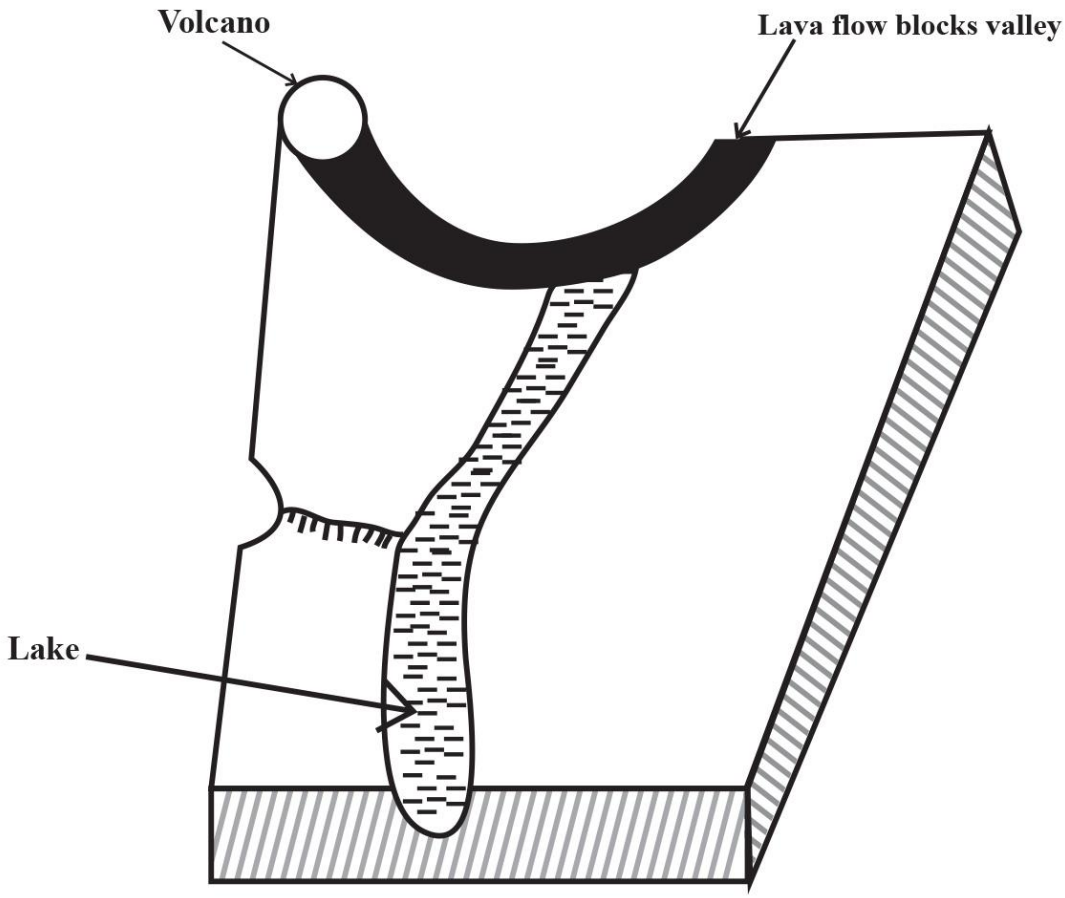


Sempaya in Bundibugyo and Kitagata in Sheema, Maji-Moto in Tanzania.

Lava dammed Lakes (Lava dammed Lake basins**):**

These are formed when a mass of flowing lava blocks a river channel to form a Lake e.g. Lake Bunyonyi, Lake Mutanda, L. Chahafi, Lake Murehe, L. Kayumba & L. Saka (Kabarole).

LAVA DAMMED LAKE



Intrusive volcanic features

Batholiths: This is a very large mass of magma which often forms the root of a volcanic mountain. It is made up of granite and it is formed very deep in the earth's crust but can be exposed on the surface by the denudation forces like weathering, mass wasting and erosion to form an Inselberg. Examples include; Singo in Mubende and the central parts of Tanzania.

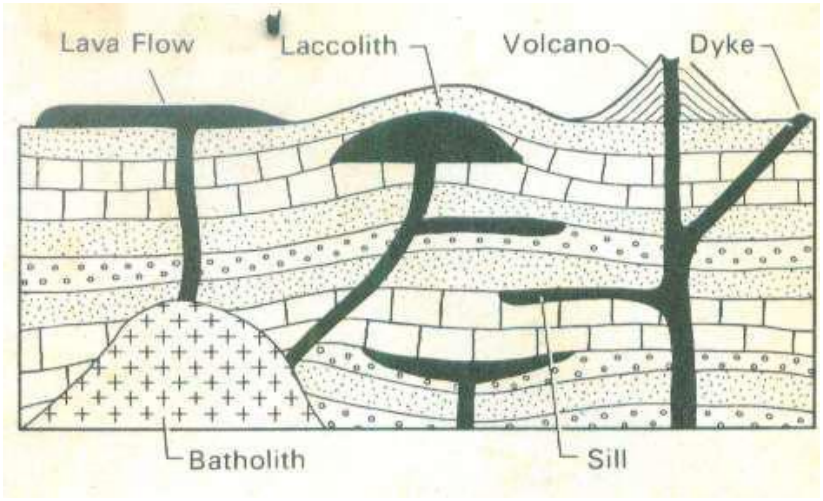
Sill: It is formed when a sheet of magma is intruded along the bedding planes (horizontally) in the earth's crust. It forms a ridge-like escarpment when exposed by erosion. Sills also lead to formation of water falls and rapids when they are crossed by a river e.g. waterfalls can be seen along Pakwach-Arua road.

Dyke: It's formed when a mass of magma cuts across the bedding planes and it forms a wall-like feature. The magma may either be steeply inclined or vertically inclined. Examples of such can be witnessed in East Africa e.g. in the Rungwa complex in Kisumu and Thika falls in Kenya.

Laccolith: This is a dome shaped feature formed when magma bulges near the surface.
The magma forces the upper layer of the earth's crust to bulge e.g. at Voi in Kenya.

Lapolith: This is a saucer shaped feature that is formed when the overlying rocks lead to the formation of depressions on the intruded magma.

Lapolith



Economic importance of Volcanicity

1. Sills can lead to formation of waterfalls e.g. Karuma falls which are good sites for generation of hydro-electric power.
2. Volcanic Mountains help in the formation of relief rainfall on the wind ward side which supports agriculture.
3. Hot springs provide medicinal water e.g. Kitagata hot spring water contains sulphur which is used to treat skin diseases.
4. Volcanicity leads to the formation of lakes which provide water for domestic and industrial use e.g. Lake Bunyonyi.
5. Crater lakes are a source of minerals which can be sold for money e.g. salt obtained from Lake Katwe hence improving people's S.O.L.
6. Volcanicity favours mining because it exposes valuable minerals near the surface of the earth e.g. Diamond mining in Mwadui plug in Tanzania.

7. Volcanic features attract tourists who bring in foreign exchange used for national development/infrastructural development.

8. Volcanic lava leads to production of fertile soil hence favouring agriculture e.g. coffee growing along the slopes of Mt. Elgon.

9. It's a basis for geographical studies hence improving on research and study purposes.

Negative importances

 Violent volcanic eruptions lead todestruction of property and human life.

- Volcanic mountains have caused rain shadows on the lee ward side of the mountain hence causing dry conditions that discourage agricultural practices.
- Salty volcanic lakes e.g. Lake Katwe can't support fishing and provision of water for human and domestic purposes.
- Mountains are covered with thick forests which hide dangerous animals e.g. Gorillas, lions and Monkeys which make human settlement very difficult.
- Mountains are used as hide outs for criminals and rebels who destabilize peace and sanity in the surrounding communities hence straining the defence budgets.
- Volcanic rocks that are not fully weathered to provide infertile soils that hinder agriculture.

Landslides are common along Mountain slopes which are destructive to human life.

Mountain tops are not suitable for human settlement due to extremely low temperatures.

Mountains accelerate soil erosion which leads to loss of soil fertility.

Dense population near mountains leads to land fragmentation on the lower slopes leading to land conflicts.

A sketch map of East Africa showing its major volcanic mountains.

KEY

- Mountains
- Lakes
- International boundaries