

# UNIT 2. RELIEF

## THE STRUCTURE OF THE EARTH

### The Crust (corteza):

The largest and thinnest layer of the Earth. Consists of the continents , the sea and ocean floors.

It is made out of solid rock.

### The mantle (manto):

Is the middle layer which is between 70 km and 2900 km Deep. Temperature in this layer are high, which causes rocks to melt. These mantle rocks that are in semi solid state are called magma.

### The core (núcleo):

Is the deepest layer.

It is though to be made of heavy minerals that appear in a viscous state in its outer and a solid state in its inner section.

Outer core surrounds the inner core and extends between 2900 and 5100. due to the extremely high temperatures the rocks are molten.

Inner core. Is at the centre of the earth. The inner core is solid composed mainly of iron.

## THE LITHOSPHERE AND TECTONIC PLATES

The Earth's relief is diverse: mountains, plateaux, plains, depressions...

The Earth's relief changes.

In 1912 the German Alfred Wegener outlined his continental drift theory. According to this theory 200 millions years ago there was a single giant land mass (one supercontinent), called Pangaea. This Pangaea was surrounded by a single ocean, called Tethys Sea.

The Pangaea broke up, forming the continents. These continents are no fixed, but they are moving, because the crust (the Earth's layer where we live) is divided into several plates, called tectonic plates.

These plates are not fixed, but they are moving slowly over the mantle. When a plate collides with another one, earthquakes and eruptions of volcanoes are caused.

The most important tectonic plates in the world are the Eurasian plate, the African plate, the North American and South American plates, the Pacific plate, the Indo-Australian plate, etc.

## PLATES MOVEMENT

**Divergent boundaries** -- where new crust is generated as the plates pull away from each other.

**Convergent boundaries** -- where crust is destroyed as one plate dives under another.

**Transform boundaries** -- where crust is neither produced nor destroyed as the plates slide horizontally past each other.

## CONTINENTS AND OCEANS

On the earth's crust there are emergent and submerged lands:

Continents. Continents occupy 30% of the land surface and are surrounded by oceans and seas. There are six continents: Asia, America, Africa, Antarctica, Europe and Oceania. Most of the emerged land is in the northern hemisphere.

Oceans. Oceans are large masses of salt water. There are five oceans: The Pacific Ocean, The Atlantic Ocean, The Indian Ocean, The Arctic Ocean and the Southern Ocean. Most oceans are in the southern hemisphere.

## LAND RELIEF

Continental relief

The Earth's surface isn't flat, there are mountains, plains, plateau, valleys, etc. The relief of the continents is very varied.

The relief is the result of the internal forces of the Earth (plate movements, volcanoes, earthquakes, etc.) and external agents (wind, rain, temperatures, rivers, groundwater, lakes, ice... and human-beings). The internal forces are responsible for the origin and the elevation of topography and external agents cause the erosion and modelling of the Earth's relief.

## VOCABULARY

Plains are large areas of flat land with no hills or slopes.

Plateau is a plain at a high altitude.

Depressions are plains which are lower than the surrounding land.

Hill are small elevation in the ground. They have lower altitude than mountains.

Mountain is a big elevation in the ground.

Valleys are low areas between mountains. Rivers are often found in valleys.

## CONTINENTAL WATERS

Continental waters are: rivers, glaciers, groundwaters, lakes and inner seas.

A river is a natural stream of water that flows in a channel. The flow is the amount of water that the river carries. Rivers are fed by overland runoff, groundwater seepage, and meltwater

released along the edges of snowfields and glaciers. Direct precipitation only provides very small amounts of water.

The mouth is where the river flows into the sea. It can be:

A delta: Low-lying plain composed of stream-borne sediments deposited by a river at its mouth.

An estuary: A flow of water in a channel like a small river.

### Vocabulary

- Archipelago. A group of islands.
- Ria. A river valley invaded by the sea.
- Beach. Accumulation of sand and gravel on low areas of the coast.
- Gulf, bay and cove. A body of water indents in the coastline. The name varies according to its size
- Peninsula. A piece of land surrounded by water, except for the isthmus that connects it to the mainland
- Cape. A large area of the coast that extends into the sea
- Delta. A deposit of materials transported by the river to the river mouth
- Cliff. A vertical wall at the edge of the land.
- Estuary. Where the river flows into the sea at the river mouth and fresh water mixes with salt water.

### GLACIERS

A glacier is a large mass of ice that forms on land through the recrystallization of snow and that moves forward under its own weight.

The movement of glaciers forms U-shaped valleys, lakes and deposit of rocks and mud, called moraines.

### GROUNDWATERS

Groundwaters are water that occurs below the surface of the Earth.

### LAKES

Lakes are standing waters that occupy an inland basin.

### LAND RELIEF

Coast relief and ocean bed relief

The coast is a broad area of land that borders the sea. Among the different types of coast relief we have to find beaches, gulfs, cliffs and capes.

On the ocean bed relief there is the continental platform, continental bank, abyssal, dorsal oceanic plain and ocean basin.

## NATURAL RISKS

The displacement of the plates also gives rise to other phenomena: volcanoes and seisms or earthquakes.

## VOLCANOS

A volcano is a huge eruption of ash, smelly gases, and melted rock below the earth. A volcano forms above the ground. However no eruption of a volcano is a single event. Along with an eruption, comes major destruction.

The main parts of a volcano are:

- Magma chamber, where the magma accumulates
- Chimney, the opening through which the magma rises inside the volcano.
- Crater, the upper part of the chimney where the materials are ejected
- Volcanic cone, a raised area around the volcano created by materials ejected from the volcano

## EARTHQUAKES

An earthquake is a shaking of the ground caused by the sudden breaking and movement of large sections (tectonic plates) of the earth's rocky outermost crust. The edges of the tectonic plates are marked by faults (or fractures). Most earthquakes occur along the fault lines when the plates slide past each other or collide against each other.

The hypocentre is the point in the earth's interior where there is a great explosion or rupture.

The epicentre is the point in the Earth's surface directly above the hypocentre.

The strength of an earthquake is measured on the Richter scale.

When an earthquake is produced under the sea, it causes a tidal wave. When this happens, the seismic waves are almost undetectable but can cause giant waves called tsunamis, which can reach up to 60 m.