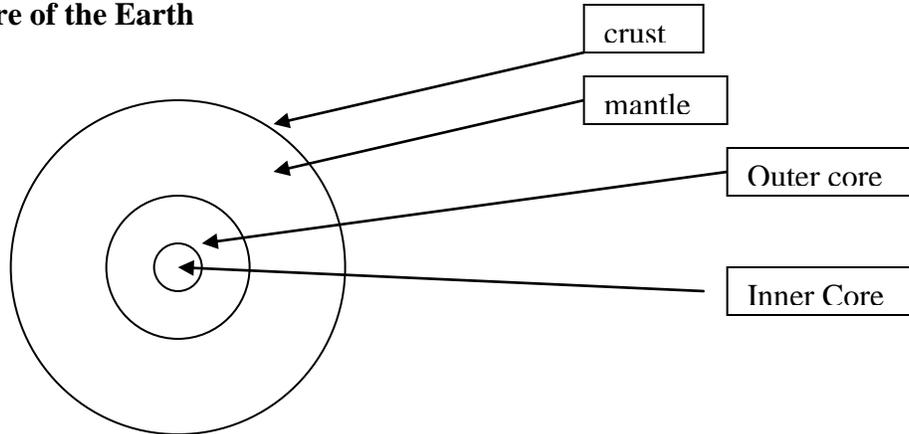


## Vocabulary : Geology and Earth's History

1. **Geology:** The study of the Earth

### 1. Structure of the Earth



a. **Core:** The center section of the Earth

**Inner Core:** hottest layer of Earth. It is solid iron and nickel because of the tremendous amount of pressure it is under.

**Outer Core:** Surrounds the inner core. Made up of liquid iron and nickel. Slightly cooler than inner core.

b. **Mantle:** Surrounds outer core. Thickest part of the Earth that contains more matter than any other layer of the Earth. Some parts of the mantle are solid rock, other parts are somewhat “fluid”. Convection currents in the mantle are what make the tectonic plates making up the Earth’s crust move.

c. **Crust:** Thin rocky skin that surrounds the mantle. Made up of all of the continents and ocean floors. It is thickest at the mountains and thinnest along the ocean floors. Made up of approximately 26 tectonic plates that float on the liquid mantle.

2. **Lithosphere:** Rocky outer shell of Earth, which is made up of the crust (including the ocean floors) and the rigid upper part of the mantle.

3. **Atmosphere:** The mixture of gases that surrounds the Earth. It extends from the Earth’s surface to approx. 600 km into space.

4. **Hydrosphere:** All of the bodies of water on Earth.

### 5. **Types of Rock:**

a. **Sedimentary Rock:** Formed in Layers called **Strata** from the sediments you get from rocks that have undergone weathering and erosion. The Layers of sediment undergo cementation and compaction (lots of pressure from the weight of sediments make the lower rock sediments stick together). Fossils may be present.

b. **Igneous Rock:** Formed from magma that has cooled and hardened.

1. **Igneous Intrusion:** a “layer” of rock made when molten rock cooled and hardened underground.

2. **Igneous Extrusion:** a “layer” of rock made when molten rock cools and hardens above the ground.

c. **Metamorphic Rock:** Can start out as sedimentary, igneous, or metamorphic rocks, and are “changed” or “transformed” due to heat or pressure.

6. **Lithification**: The process by which rock sediments are compacted and cemented to form sedimentary rocks.
7. **Crystallization**: The process by which molten rocks cool and harden to make igneous rocks.
8. **Metamorphism**: The process by which rocks are changed or transformed by heat, pressure, or chemicals to become metamorphic rock.
9. **Rock Formation**: A group of rocks arranged in a certain way.
  - a. **Anticline**: an upward fold in rocks that looks like an arch
  - b. **Syncline**: a downward fold in rocks that looks like a trough
10. **Fault**: A break in the crust along which movement occurs.
11. **Weathering**: The breaking down of rock by the action of water, ice, plants, animals, and chemical changes.
12. **Erosion**: The process by which sediments (rock particles) are carried away from their “source” by wind, moving water, or moving ice (glaciers). The driving force behind erosion is gravity.
13. **Unconformity**: A surface of eroded rock that separates younger rock layers from older rock layers.
14. **Principle of Uniformity**: The processes that changed the Earth in the past still exist today: weathering, erosion, volcanoes, earthquakes, etc.
15. **The Law of Superposition**: The lower the rock layer is, the older the rock layer is because the lower layers had to be deposited first in order for the other layers to form above them.
16. **Fossils**: The preserved remains or traces of plants or animals that lived long ago. Most fossils consist of the hard parts of animals such as bones, teeth, or shells which are preserved in rock. Plant fossils are rare because they have few hard parts. Fossils provide a record of past life on Earth. They show that many species from the past have become extinct.
17. **Index Fossil**: The fossil of a plant or animal that lived only during a brief period of geologic time, generally over a wide area. If you find an index fossil in a piece of rock, you know that the rock was formed during the time period when the given species was alive. Index fossils can be used to find an approximate age of a layer of rocks.
18. **Eras**: The history of the Earth is divided into 4 major divisions called Eras. They are: Precambrian Era, Paleozoic Era, Mesozoic Era, Cenozoic Era. Each Era has ended with major changes in landscape and climate throughout most of the world. Major changes in plants and animals also took place.
19. **Periods**: Each Era is divided into time sections called periods.
20. **Extinct**: A species of plant or animal that is no longer living is said to be extinct. Reasons that animals went extinct: they could not adapt to their environment- climate may have changed, changes in food supply, changes in the types of competition necessary for resources, etc.
21. **Absolute Dating**: Process that allows you to determine the actual age of rocks in years.

22. **Radioactive Dating**: Method used for finding the age of rocks that is based on the rate of decay of certain radio-active elements (like uranium and Carbon 14). As these elements release radiation they decay (break down into lighter elements). Radio-active decay occurs at a constant rate- energy is released during the process in the form of electromagnetic radiation.
23. **Half-life**: The time that it takes for half of a radio-active material to decay (turn into something else).
24. **Equator**: an imaginary line drawn around the Earth half way between the poles. It divides Earth into northern and southern hemispheres. The equator is located at 0 degrees latitude.
25. **Latitude**: Describes positions north or south of the Equator. Latitude is measured using an imaginary set of lines called parallels that run east and west around the earth parallel to the equator. They are measured in degrees from 0 degrees (at the equator) up to 90 degrees North at the North pole and 90 degrees South at the South pole.
26. **Prime Meridian**: An imaginary line running from north to south through Greenwich , England. It is located at 0 degrees longitude.
27. **International Date line**: An imaginary line running north to south at 180 degrees East and West longitude (in the Middle of the Pacific Ocean) .
28. **Longitude**: describes positions east or west of the Prime Meridian. Imaginary lines called meridians are used to determine longitude. Meridians have longitudes between 0 degrees at the Prime Meridian and 180 degrees East or West at the International Date Line.
29. **Tectonic Plates**: The surface of the Earth is made up of approximately 26 chunks called tectonic plates. Some Tectonic plates are made up of continents only, some are made up of ocean floors only, and some are made up of a combination of continents and ocean floors. These Tectonic Plates sit on top of the molten rock of the Earth's mantle, and are constantly moving due to convection currents in the mantle.

\*There are 3 types of tectonic plate boundaries:

- a) **Convergent Plate Boundary**: two tectonic plates moving towards each other.
  - b) **Divergent Plate Boundary**: two tectonic plates moving away from each other.
  - c) **Transform Plate Boundary**: two tectonic plates sliding past each other.
30. **Seismograph**: a device used to record and measure the shock waves caused by earthquakes. The more severe the vibrations of the earthquake are, the higher the up and down strokes of the pen on a seismograph are.
  31. **Seismogram**: The print out from a seismograph machine.
  32. **Thee types of Earthquake waves**:
    - a) **Primary waves**: (P-waves) these waves move the fastest and are the first to be recorded by a seismograph. P-waves can travel through solids and liquids.
    - b) **Secondary waves**: (S-waves) move slower than p-waves and are the second type of wave to be recorded by a seismograph machine. S-waves can only travel through solids.
    - c) **Surface waves**: the slowest moving waves. These waves cause the Earth's surface to rise and fall causing the most damage during an Earthquake.

33. **Focus**: the exact center of an earthquake (It is underground)
34. **Epicenter**: the point directly above the focus of an earthquake located on the surface of the earth.
35. **Theory of Plate Tectonics**: Explains the major features of the Earth such as earthquakes, volcanoes, and mountains. The theory states that the Earth's crust is broken into chunks called plates that float on the liquid mantle.
36. **Theory of Continental Drift**: At one time the continents were all one land mass, and over millions of years the continents have drifted / moved apart. Theory was proposed by Alfred Wegener in 1912.
37. **Pangaea**: The name of the "super continent" when all of the continents were once clumped together to make one giant land mass.
38. **Glacier**: A moving mass of ice formed over many years in which snowfall exceeds melting. Glaciers are involved in erosion.
39. **Paleontology**: The study of prehistoric living things through fossils.