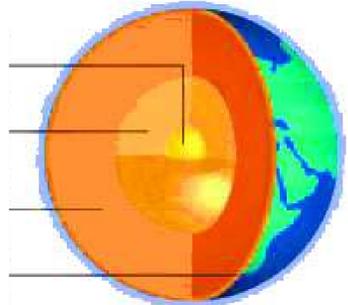


Cross-section through Earth

- Inner core:** Solid - nickel & iron
- Outer core:** Liquid - nickel & iron
- Mantle:** Molten rock
- Crust:** Solid rock



Rocks are constantly being formed and deformed, worn down and formed again. This is known as the rock cycle. For rocks to change takes millions of years. Rocks are divided into 3 main types:

- **Igneous**
- **Sedimentary**
- **Metamorphic**

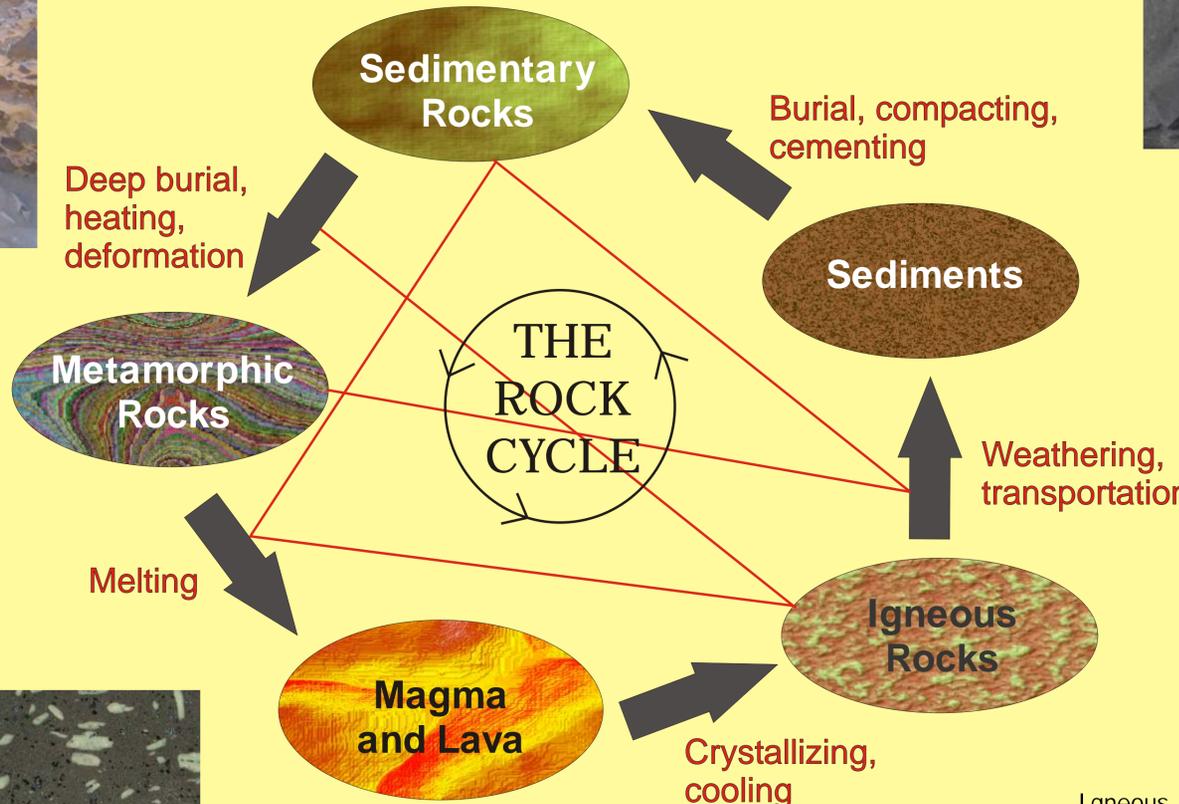


Sedimentary Rocks

As mountains are worn away by erosion over millions of years, most of the rocky debris ends up in streams and rivers flowing towards the sea. Eventually, as the water slows down - this load of sediments settles to the bottom of a lake or ocean, or along the river course. After further millions of years, pressure from the growing sediment pile compacts the lowermost layers and turns them into **clastic** sedimentary rocks. **Chemical** sedimentary rocks form by precipitation of non-organic or organic chemicals, e.g. the skeletons of tiny organisms like diatoms.

Examples of sedimentary rocks are sandstone, shale, and limestone. Some sedimentary rocks contain fossils of plants or animals, which were preserved as they were buried under fresh layers of sediment before they had time to decay. Where there are large amounts of organic matter contained within the sedimentary rocks, coal, oil, or natural gas deposits may form from their carbon content.

- The **Crust** makes up less than 1% of the Earth's mass, and consists mainly of oxygen, magnesium, aluminum, silicon, calcium, sodium, potassium, and iron, which form rocks and minerals. Continental crust is about 35 km, oceanic crust some 7 km thick.
- The **Mantle** is the solid casing of the Earth's core and is about 2900 km thick. It makes up about 70% of Earth's mass, and consists of silicon, oxygen, aluminum and iron.
- The **Core** is mainly made of iron and nickel and makes up about 30% of Earth's mass. The **Outer Core** is ca. 2200 km thick and liquid, while the **Inner Core** is 1300 km thick and solid.



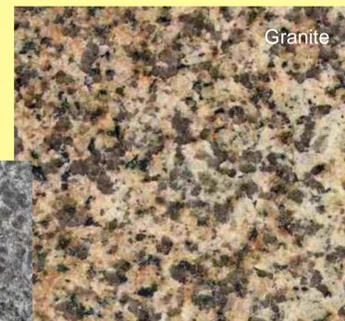
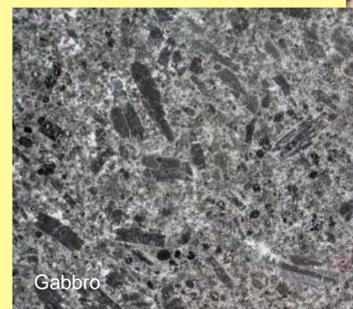
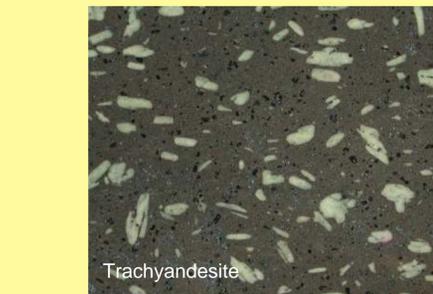
Metamorphic Rocks

Metamorphic rocks were originally igneous or sedimentary, but due to movement of the earth's crust, or continued sedimentation and deep burial, have undergone conditions of extreme heat and pressure, which have altered both their appearance and physical properties (from Greek meta = change and morphos = form).

Examples of metamorphic rocks are marble (originally limestone), schist (originally shale) and gneiss (high-grade metamorphic rock derived from either igneous or sedimentary precursors).



Cross-section through a volcano showing magma "channels"



Igneous Rocks

Igneous means related to fire or heat. When molten rock comes up to the Earth's surface, new igneous rock is created. While it is still liquid and inside the Earth's crust, it is called magma. Below the surface the magma cools and solidifies slowly to become granite, diorite or gabbro, depending on its chemical composition (intrusive igneous rocks).

However, when the magma reaches the Earth's surface and flows out during a volcanic eruption, the viscous liquid is called lava. When lava cools and hardens, it turns into obsidian, lava rock (e.g. basalt, rhyolite, andesite) or pumice, depending on its composition and the nature of the volcanic event, i.e. effusive or explosive (extrusive igneous rocks).

