

LEARNING OUTCOMES:

- Internal Structure of the Earth
- Classification of Rocks
- The Rock Cycle
- Intrusive Igneous Activity and associated features
- Overview of landforms associated with different rocks

INTERNAL STRUCTURE OF THE EARTH

The Earth is made up of four layers.

The Crust

- **Outermost layer of the Earth.**
- **Comparatively thin layer – ranges from 8 km to 40 km in thickness.**
- **Divided into two types: continental crust and oceanic crust.**
- **Boundary between the crust and the mantle (next layer) is called the Mohorovicic Discontinuity (Moho Discontinuity).**

Continental Crust

- **Consists mainly of Granite rocks.**
- **Thicker layer with low density.**
- **Granite rocks composed of silicon and aluminium.**
- **Called SIAL.**

Oceanic Crust

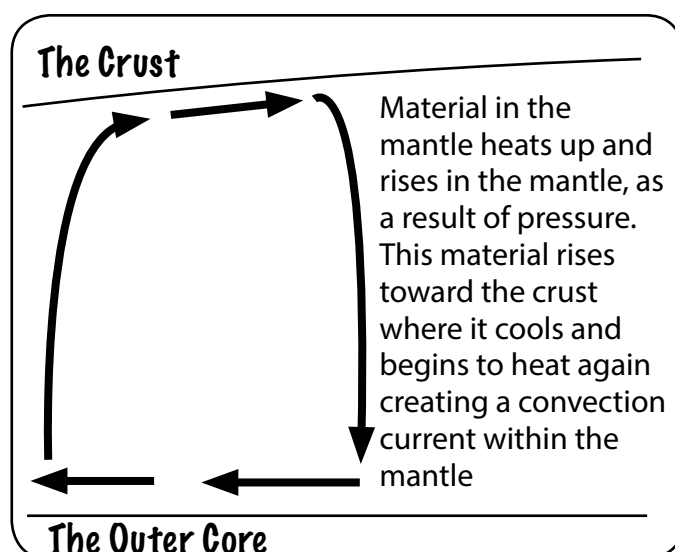
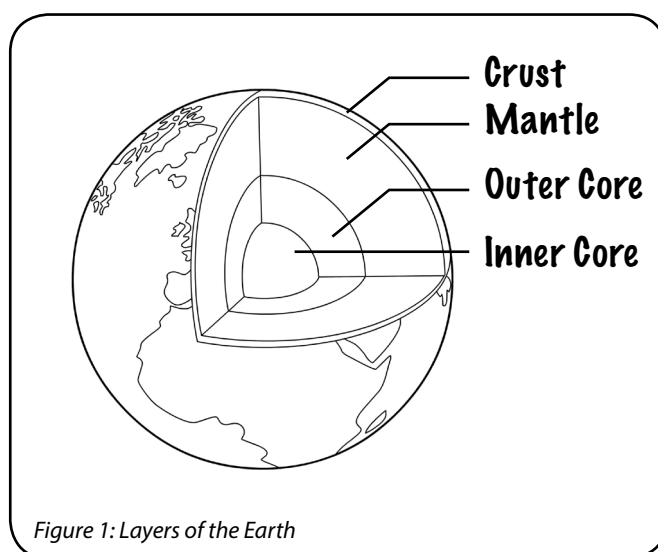
- **Mainly composed of basalt and is a thinner layer with a higher density.**
- **Rich in silicon and magnesium.**
- **Called SIMA.**

The Mantle

- **Next layer (beneath the crust).**
- **Thickness of about 2900 km.**
- **Consists of molten rock (semi-fluid or semi-melted material).**
- **Temperatures may reach 500°C.**

The Core

- **The core is in the centre of the Earth: consists of an outer core, that is liquid, and an inner core that is solid.**
- **The combined radius of the core is about 3475km.**
- **The core's temperature is above 2000° C.**
- **The core is made of Nickel and Iron.**



The layers can also be divided into different sections. Namely,

Lithosphere: *the rigid outer part of the Earth, consisting of the crust and upper mantle.*

Asthenosphere: *the upper layer of the Earth's mantle, below the lithosphere, in which there is relatively low resistance to plastic flow and convection is thought to occur.*

Mesosphere: *The mesosphere refers to the mantle in the region under the lithosphere and the asthenosphere, but above the outer core. The upper boundary is defined as the sharp increase in seismic wave velocities and density at a depth of 660km.*

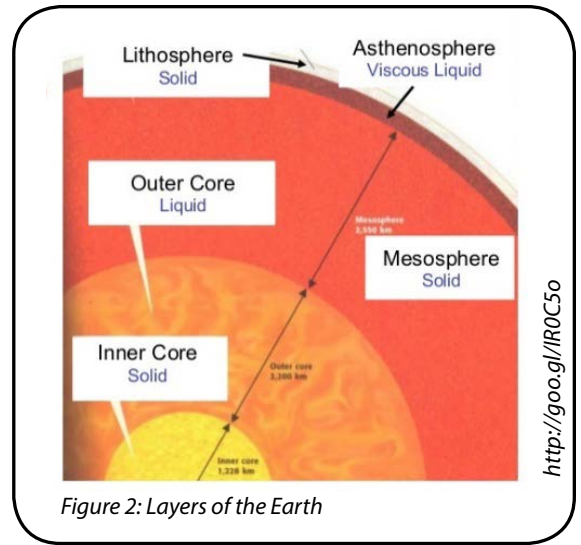


Figure 2: Layers of the Earth

ACTIVITY 1

For each of the igneous intrusions below; write a description of the intrusion and draw a sketch diagram of what the intrusion would look like.

Intrusion	Description of formation and identifying features	Sketch Diagram
Batholith	<i>is a large emplacement of igneous intrusive (also called plutonic) rock that forms from cooled magma deep in the Earth's crust.</i>	<i>Use images from the diagram given to learners.</i>
Laccolith	<i>a mass of igneous rock formed from magma that did not find its way to the surface but spread laterally into a lenticular body, forcing overlying strata to bulge upward.</i>	
Lopolith	<i>a mass of igneous rock similar to a laccolith but concave downward rather than upward.</i>	
Dyke	<i>a long, narrow, cross-cutting mass of igneous rock intruded into a fissure in older rock.</i>	
Sill	<i>a tabular body of intrusive igneous rock, ordinarily between beds of sedimentary rocks or layers of volcanic ejecta.</i>	
Monolith	<i>A large intrusion that often stands above the surrounding land as a towering wall of rock.</i>	
Pipe	<i>Central vents of volcanoes.</i>	

GRADE 10	TERM 2	SOCIAL SCIENCES (GEOGRAPHY) GEOMORPHOLOGY UNIT 1: THE STRUCTURE OF THE EARTH - MEMO
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SOME DEFINITIONS:

Strata	<i>Horizontal layers of sedimentary rock.</i>
Magma	<i>Liquid rock inside the Earth.</i>
Lava	<i>Liquid rock that flows on the Earth's surface.</i>
Weathering	<i>The process that breaks down large rock surfaces into smaller boulders, stones, pebbles and grains of sand.</i>
Erosion	<i>The process whereby weathered material is carried away by wind, water or ice rubs away the surface of the Earth.</i>