



**Leaving Cert Agricultural
Science**

Free Notes

Soil Science



Soil Science:

- ✚ Soil may be defined as “the unconsolidated mineral and organic material on the immediate surface on the earth that serves as a naturally medium for the growth of land plants”.
- ✚ What does the above mean in simple terms?
- ✚ Soil is a mixture of mineral (inorganic) particles and organic material, with air and water spaces (pores) in between.

Types of rocks:

1) Igneous rock

- ✚ Formed by solidification (hardening) of molten Material/rock
- ✚ Quartz-coarse grained, Felspar, Mica, Basalt- fine grained (Give rise to *acid* soils), Antrim plateau, Galway has granite rock.



Composition of types of igneous rock:

Quartz	Feldspar
<ul style="list-style-type: none"> ✚ Made up of irregular surfaces with a colourless glass like appearance. ✚ This is made up of silicon oxides which is acid forming and leads to acidic soils when in large amounts. 	<ul style="list-style-type: none"> ✚ Silicates of aluminium, sodium, calcium and potassium. ✚ Have various colours; grey, white or pink

What is a mineral?

- ✚ Any inorganic substance that exists in nature with a complete definite chemical structure/composition

Granite	Basalt
<ul style="list-style-type: none"> ✚ Type of igneous rock ✚ Granite formed when lava cooled very slowly under the surface of the earth thus there was time for large 	<ul style="list-style-type: none"> ✚ Type of igneous rock ✚ In comparison to granite basalt formed when lava cooled quickly on the earths surface forming small

crystals of mica, feldspar, and quartz to from.	crystals that are only visible under a microscope
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2) Sedimentary rock

- ✚ Rocks subjected to weathering due to forces like wind rain frost & ice.
- ✚ Most common rock in Ireland.
- ✚ Sandstone – ACID Soils- Waterford/Cork/Kerry
- ✚ Shale- less acidic- North Kerry/West Limerick
- ✚ Limestone -Alkaline Soils(texture- Between sandy & Clayey)- Centre of the country.

Sandstone:

- ✚ Rocks that derived (comes from) cemented sand particles are called sandstones.
- ✚ One example into the existence of sandstone: These can come about from sediment washed into the sea from rivers and are sorted into different particle sizes (small clay particles) and can be further carried out to sea than sand grains. The sand is mainly made up of quartz. As this sandstone contains a lot of quartz, the sandstone is classified as being an acid rock.

Shale:

- ✚ These types of rock come from clay particles.
- ✚ They contain small amounts of quartz and are very fine – grained.
- ✚ This type of rock tends to have a high amount of clay content and is less acidic than those that develop into sandstone.

Limestone:

- ✚ As the name says; limestone contains lime (Calcium carbonate) either as the main content of this rock type or in a high amount.
- ✚ They come from the dead decaying remains of fossils of animals and shells of shell – fish.
- ✚ This is an alkaline rock because of the high amount of calcium carbonate which is a base.

3) Metamorphic rock

- ✚ Formed by action of intense heat or pressure on igneous or sedimentary rocks.
- ✚ This was due to heat given from magma and also pressure from movements of earths crust.
- ✚ They are usually found in the outer margins of granite and basalt areas.
- ✚ During this process new materials within the rock may form although the chemical composition does not change.
- ✚ When limestone changes into marble under immense heat (high temperatures), both rocks look very different but are the same n chemical structure (CaCO₃).
- ✚ Shale → slate (intense pressure)

- ✚ Gneiss and schist are formed from granite and shale by both pressure and heat.
- ✚ Quartzite is metamorphosed sandstone that gives rise to acidic sandy soils, but slate gives rise to clay soil with a lower level of acidity.

Locations: Schist, gneiss and quartzite: Connemara, Mayo, Donegal, Derry and Tyrone.

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