

ESS 110: Introduction to Geology Dr. Woltemade Rocks Lab	Name: _____ Section (circle): 8:00 AM 9:30 AM 11:00 AM
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Comparing Igneous, Sedimentary, And Metamorphic Rocks

The three rock types each have a unique appearance that helps to distinguish them.

Igneous Rocks

Igneous rocks have a “crystalline” appearance due to inter-grown mineral crystals formed by the cooling of magma or lava. Igneous rocks are classified based on texture and mineral composition.

Common textures of igneous rocks include:

Phaneritic - igneous rocks with crystals large enough to be seen with the naked eye cooled slowly and are intrusive.

Aphanitic - igneous rocks with crystals too small to be seen with the naked eye cooled more rapidly and are extrusive.

Porphyritic – a mixture of some large crystals (slow cooling) embedded in a background of small crystals (rapid cooling).

The mineral composition of igneous rocks may be:

Felsic – lighter colors due to dominant minerals such as quartz and feldspar.

Mafic - darker colors due to minerals rich in magnesium and iron (olivine, hornblende, augite, etc.)

Sedimentary Rocks

Sedimentary rocks are composed of lithified sediments (small rock fragments or precipitated materials). Sedimentary rocks can be distinguished from igneous and metamorphic rocks since they form in layers (or “strata”). Another key feature that sets them apart is their fossil content. Fossils are rarely found in igneous and metamorphic rocks.

Sedimentary rocks can be classified by three factors: (1) Clastic (or “detrital”) rocks containing particles from pre-existing rocks, which are classified by particle size and sorting, (2) Organic rocks made from shells, silica based mineralization (chert), or carbon based development (coal), (3) Chemical rocks in which the minerals were produced by chemical precipitation. Note that “bio-clastic” sedimentary rocks include characteristics of the first two categories.)

