

# Gneiss Encyclopedia Article

## Gneiss

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# Gneiss

Gneiss (pronounced "nice") is a **metamorphic rock** consisting mostly of **quartz** and **feldspar** and showing distinct layering or banding. The layering of a gneiss may be weak or well-developed and consists of varying concentrations of biotite, garnet, hornblende, mica, and other **minerals**. These structures do not record a layered deposition process but arise from preferential recrystallization along flow or stress lines during metamorphosis of the parent **rock** (protolith).

The gneisses are a very varied group, including both **igneous rocks** and metamorphosed **sedimentary rocks**, and may be categorized as quartzofeldspathic, pelitic, calcareous, or hornblende gneiss.

Quartzofeldspathic gneiss forms by metamorphosis of either **silicic** igneous rocks such as **granite**, **rhyolite**, and rhyolitic tuff—or silicic sedimentary rocks such as **sandstone**. Quartzofeldspathic gneiss containing eye-shaped feldspar **crystals** is termed augen gneiss after the German *augen* (eyes).

Pelitic gneiss is formed by metamorphosis of clay-textured sedimentary rocks, particularly those rich in **iron**.

Calcareous gneiss contains calcite ( $\text{CaCO}_3$ ). It is formed by metamorphosis of limestones and dolomites containing large fractions of **sand** and **clay**. Calcareous gneisses with large fractions of calcite blur conceptually with the marbles (metamorphosed limestones).

Hornblende gneiss contains a large fraction of hornblende in addition to its quartz and feldspar.

The gneisses can be alternatively categorized simply as orthogneisses and paragneisses. The former are metamorphosed from igneous protoliths and the latter from sedimentary protoliths.

The gneisses and schists are closely related. Both are metamorphosed igneous or sedimentary rocks showing foliation or layering. The difference is primarily one of degree; schists are less coarsely crystallized and more prone to cleave into flakes or slabs. Gneisses represent a higher grade of metamorphosis—more thorough melting—and are distinguished by their coarser texture and their resistance to cleavage.

## See Also

Migmatite