

GRANITE

Type of rock and how it forms:

Granite is an igneous rock. Igneous rocks form when magma crystallizes. This can happen underground (intrusive igneous rocks), generally giving rise to big crystals because crystallization is slower, or above ground (extrusive igneous rocks) which produces rocks with fine crystals or glass-like appearance. Granite is intrusive, it is formed underground.



Minerals in granite and variations in appearance:

Granite comes in many different shades of pink, grey, and white. The color variations result from the elements present. Pink granite has more potassium for example which shows up as large pink feldspar crystals. White/light grey crystals are quartz. The black crystals are the biotite (a mica), and there may be specs of black hornblende. The size of the crystals in granite also vary. The bigger they are, the deeper the rock formed underground- it took longer to cool and therefore crystals had more time to grow.

Where granite is found in NC:

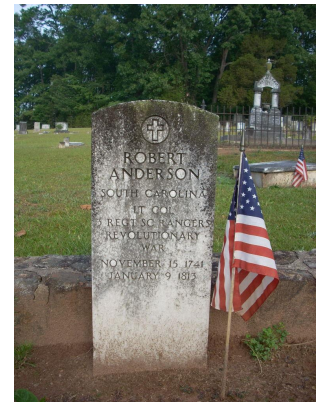
Granite is found in many NC counties such as: Avery, Mitchell, Rowan, Surry, Watauga, Wake, Davidson and Iredell Counties, mainly in the Blue Ridge Region but some in the Piedmont as well. The granite quarry in Mt. Airy, NC is the largest open-faced granite quarry in the world.

Uses:

Gravestones and memorials, buildings, kitchen counters, floor tiles and rock climbing!

Fun Facts

- Rock climbers love granite because of its sturdiness and cracks.
- The first commercial railroad (which was found in MA) was made for transporting granite.
- The platform on which the Statue of Liberty stands is made of granite.
- New Hampshire is known as the "Granite State".
- Granite is the official state rock of not only New Hampshire, but also: North Carolina, South Carolina (blue granite), Wisconsin (red granite) and Vermont.



SANDSTONE

Type of rock and how it forms:

Sandstone is a sedimentary rock. Sand is deposited when currents in bodies of water slow down to the point that it can no longer carry sand grains. Once deposited, the grains (called clasts) are buried under layers of other sediment. Groundwater brings in a cement that precipitates in the spaces between the clasts. The cement 'glues' the grains together.



Minerals in sandstone and variations in appearance:

The sand in sandstone refers to the size of the clasts that make it up. The composition of the clasts depends on the source material at the time of deposition. Most sandstones (called **arenites**) are made up of quartz because it is resistant to breaking down (weathering). Other sandstones that have mineral or rock fragments that have not moved far from their source (and not had the time to weather into something else) can be pink or reddish in color because they are rich in feldspar (called an arkose). Another type of sandstone is a **wacke** that is grey in color because of rock fragments typically eroded off a mountain/volcano.

Where sandstone is found in NC:

There are several formations that have sandstone under the Coastal Plain of NC. Thick sections of older sandstone are found just to the west along the border with TN.

Uses:

Sandstone can be used as a building stone since it is soft and easy to cut and carve. It is also used for decorative construction like fountains and sculptures.

Fun Facts

- The White House is made of a sandstone quarried in VA. It is white because of the sealant they put over the porous sandstone to keep moisture out.
- The national parks of the desert southwest US are dominated by sandstone. Many of the sandstones were sediments blown in by the wind. Left behind are crossbeds recording the direction that the wind was blowing millions of years ago.
- Sandstones can have fossils in them which preserve a record of life at the time the sand was deposited.



GNEISS

Type of rock and how it forms:

Gneiss is a metamorphic rock that forms during the building of mountain chains because of an increase in heat and pressure. Heat and pressure increase with depth, and also when plates collide (causing whole regions of the Earth's crust to become metamorphosed). The protolith (pre-existing rock) for gneiss can be many different rock types (granite, siltstone, etc.)



Minerals in gneiss and variations in appearance:

Gneiss is identified by its characteristic type of foliation called banding. Banding refers to the light and dark layers (seen as stripes when looked at from the side). This mineral segregation occurs because of the directed pressure during plate collision. The dark bands are usually made up of biotite, hornblende, garnet or graphite; the lighter bands are usually quartz or feldspar.

Where gneiss is found in NC:

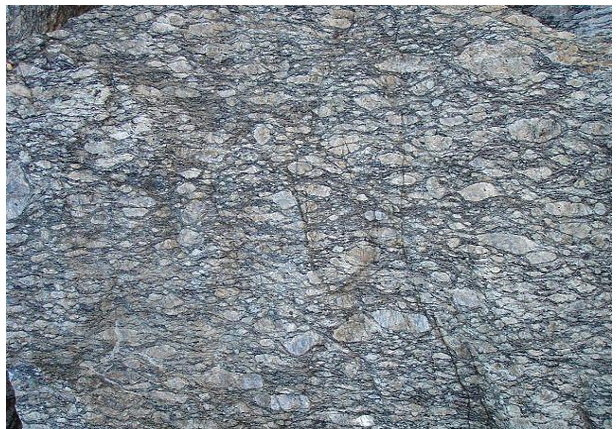
Gneiss is found throughout the mountains of NC, it makes up the core of the Appalachian Mountain Chain. Some well-known gneiss formations are: Wilson Creek, Grandfather Mountain, Cranberry and Blowing Rock.

Uses:

Gneiss is used as a building stone. It is foliated therefore it is often used as a cladding stone (to cover the outside of buildings) because it can be broken into flat slabs. It is also used as flooring, work surfaces and gravestones.

Fun Facts:

- Geologists study gneiss because the minerals in gneiss can tell them the temperature and pressures at which they formed. Knowing this can help a geologist understand how mountains formed.
- "Augen" gneiss (come the German for "eyes") is a type of gneiss with eye shaped crystals. For example the Blowing Rock gneiss.



MARBLE

Type of rock and how it forms:

Marble is a metamorphic rock formed by an increase in heat and pressure that recrystallized the calcite that makes up the sedimentary rock limestone. Marbles can also form from the metamorphism of dolostone. This metamorphism occurs mainly during mountain building events associated to plate tectonics, but can also happen when limestone is intruded by magma (this is called contact metamorphism).



Minerals in marble and variations in appearance:

Marble is made up of calcite or dolomite. It is usually white but can have streaks of other colors (usually black, grey, or pink) due to impurities (elements and minerals other than calcite - CaCO_3).

Where marble is found in NC:

There used to be more marble in NC, even a city named for its quarries (Marble, NC), but currently marble is only mined in two quarries in the Blue Ridge Region for aggregate.

Uses:

Marble is used as a building stone, monuments, and in artworks. It is also used in industry as an additive to cosmetics, toothpaste, paint, and paper. Marble is also used in crushed stone (aggregates).

Fun Facts:

- Many of the buildings and memorials in Washington DC, such as the Lincoln Memorial and the US Supreme Court are made of marble.
- The Taj Mahal in India is made entirely of marble.
- The “cultured marble” that many bathroom floors and tiles are made of is a man made product made from marble dust mixed with plastics and dyes to imitate real marble.

