

Rocks of Virginia on Display

Petersburg Granite (first three rocks below): **IGNEOUS** rock. These samples are approximately 330 million years old. Typically, a light bluish-gray to gray, fine to medium-grain Granite. Generally formed from minerals, such as Quartz, Orthoclase Feldspar, Plagioclase Feldspar, Mica, and Hornblende.



Fine Grain **Petersburg Granite** with a Quartz-Feldspar vein.



Monzonite

White **Petersburg Granite.** Orthoclase and Plagioclase Feldspar, with a bit of Quartz.





Granite Gneiss (pronounced "n<u>ice")</u>

A **METAMORPHIC** rock with essentially the same minerals as Granite. The original Granite was subjected to heat and pressure which caused similar minerals to migrate together, and form distinct layers or mineral banks.



Catoctin Greenstone

A **METAMORPHIC** rock created from a volcanic lava flow, called Basalt. 500 million years old. During geologic processes that created the Blue Ridge Mountains, Epidote and Chlorite minerals infused the rock, giving it a green color. Found in the Charlottesville area.



Is this a zebra hiding in the grass? No! It is a zebra rock!

"Zebra Rock": Porphyritic (different-sized crystals) Petersburg Granite. The smaller white crystals are Orthoclase, and the light to dark gray minerals are Quartz and Plagioclase. There is a Microcline vein (pink) running through the rock, and the black areas are "xenoliths" of Bedrock (see IGNEOUS rock for additional information)

Specks of Fools Gold: Look closely at this dark rock and you will see scattered golden specks of the mineral Pyrite. Since it looks like gold, but isn't, Pyrite is also called Fool's Gold.





A SEDIMENTARY

rock. This sample is about 200 million years old. Fossils of Trilobites (sea animals) can be found in some Shale deposits in Virginia.



Layers of the Earth

No humans have been to the center of the Earth, but geologists have learned a lot about it. Geologists believe the Earth is neither liquid nor solid all the way through. It is made up of different layers. Some of these layers are solid, some are liquid and some are both. The layers of the Earth have special names - the Crust, the Mantle, and the Core. These layers vary in thickness and in temperature.



CRUST

Everything you see is part of the crust. It is where you find rocks, grow plants, look for squirrels, and play with friends. It is like a thin skin that covers an apple. The Earth's crust is anywhere from 3-30 miles (5-50km) thick, depending on whether you are measuring from the bottom of the ocean or the top of a mountain.

MANTLE

The layer under the crust is called the mantle. This is the thickest laver of the Earth and made of mostly molten (liquid) rock called magma and some solid rock. Can vou imagine a rock that is so hot that it melts? It is about 1,800 miles (2,900km) thick and makes up 84% of the Earth's total volume. The mantle is very hot - about 5,400*F (3,000 *C) in some spots.

CORE

The layer under the mantle is the core. The core is about 2,200 miles (3.500km) thick and extremely hot - up to 10,8008F (6,000*C). This is as hot as the surface of the sun! It is divided into an inner core and outer core. The outer core is liquid layer of melted nickel and iron. The inner core is made of solid nickel and iron.

The Rock Cycle It never stops!

Every rock has a story, just like a book. Once you know how it was made and what is in it, you know the story of how it got here and where it came from.



MAGMA

Magma is melted rock. There is lots of magma beneath the Earth's surface (crust). When a volcano erupts and releases magma on the surface of the Earth, we call it lava.



IGNEOUS ROCK

When magma cools, it turns into **IGNEOUS** rock. It might cool under the surface, or come out of a volcano. Some **IGNEOUS** rocks, especially Granite, contain chunks of other stray rocks that got trapped in it while it was forming. We call these strays xenoliths. There are xenoliths on display here. They are the separate dark black chunks in our Zebra Rock.

SEDIMENT

Next, the weather, rivers or streams, and other events can slowly break up (erode) all types of rocks into small pieces of gravel, sand, silt and clay, called sediment. Sediment may even include remains of living things, such as shells, leaves, wood, or bones. These might turn into fossils.

SEDIMENTARY ROCK

As sediment builds up and hardens over hundreds to thousands of years, pressure from layers above can squeeze it into a different kind of rock, called **SEDIMENTARY** rock. Examples: Coal, Shale (on display in the park), Limestone, and Sandstone.

METAMORPHIC ROCK

Any type of rock may later get covered with more sediment or other rocks. It may even be pushed deep into and under the Earth's crust, such as during an earthquake. The deeper into the Earth this material goes, the hotter it gets, and the more pressure there is. When the heat and pressure get high enough, this rock material can turn into something completely different. It turns into **METAMORPHIC** rock. Examples: Marble, Kyanite, and Granite Gneiss (pronounced like "nice"). The pressure that forms gemstones! If this same **METAMORPHIC** rock continues to get even more heat and pressure, it can melt and turn back into magma. This starts the whole process over, and is why it is called the rock cycle. Rocks are always changing!

Many thanks to Luck Stone Corporation for these rocks on display. All were quarried on Luck Stone's properties, and generously donated to Bellemeade Park.