

Scratch Patch Interpretive Signs

A Rocky History

Rocks seem solid and steady and we tend to believe they stay the same forever. But, over millions of years, they can be created, broken up, stuck back together, squished, or cooked! Just like everything on our planet, rocks are constantly changing. All of the rocks you ever find will be one of three types:

- Igneous
- Sedimentary
- Metamorphic

Igneous Rocks

All rocks start their life as igneous rocks. They are formed directly from magma -- liquid rock far below the surface of the earth. Some of them become rocks while still under ground and emerge slowly. Others make a more explosive entrance before hardening into their rock shape.

Igneous rocks that form below the Earth's surface are called **intrusive** igneous rocks. They form when magma enters an underground chamber and cools very slowly. Igneous rocks cool their heels below the surface of the earth for a long, long time. When they eventually surface, their crystals are well-formed and easy to see.

Igneous rocks that form above the Earth's surface are called **extrusive** igneous rocks. These form when lava cools quickly at or well above the Earth's surface. These igneous rocks sometimes look like dark-coloured glass because their crystals are very, very small.

A different kind of grain

You can tell different kinds of igneous rocks apart by their **texture**, starting with the size of the mineral grains. Extrusive rocks cool quickly (over periods of seconds to months) and have invisible or very small grains. Intrusive rocks cool more slowly (over thousands of years) and have small to medium-sized grains.

Can you figure out what kind of igneous rock is sitting by the door of the Scratch Patch?

Sidebar:

Basalt is a very common igneous rock. In fact, it is the most common rock in the Earth's crust. It covers about 70% of our planet's surface, including all of the ocean floors.

Did You Know?

- When liquid rock (or magma) emerges from the earth, it is called lava.
- Basalt is not only found on our planet. It has also formed on Earth's Moon, Mars, Venus, and even on the asteroid Vesta.
- Shield volcanoes, such as those that make up the islands of Hawai'i, are composed almost entirely of basalt, as are most oceanic islands.

SEDIMENTARY ROCK

Rocks are attacked by wind and rain as soon as they appear on the earth's surface--These forces break rock down into smaller pieces called sediment. The smaller pieces get carried along by rivers or land masses, until deposited in ocean or lake beds. The tremendous weight of the water above compresses the bits and pieces over many years until they become new sedimentary rocks.

Sidebar:

When rocks become sedimentary stones, they are in one of the most interesting phases of their lives because they often contain fossils. The different layers of sedimentary rock can help scientists determine the ages of various fossils -- the deeper the layer in which they are found, the older the fossil.

Sidebar:

Sandstone is one of the most commonly found sedimentary stones. Most sandstone is composed of quartz and/or feldspar because these are the most common minerals in the Earth's crust.

Uluru (Ayer's Rock) in Australia is one of the most famous sandstone formations in the world. It stands 348 meters (1,142 ft) high and measures 9.4 km (5.8 mi) in circumference!

Sidebar:

Stalactites are made from a sedimentary rock called limestone. These sedimentary rocks are not formed through weathering and erosion. Limestone is created when a single drop of water falls, leaving behind a thin ring of the mineral calcite. Over the course of years, many drops fall, leaving behind their calcite rings and the stalactite grows longer and longer.

METAMORPHIC ROCK

Metamorphic rocks have had a very hard life. As igneous or sedimentary rocks, they are forced back below the surface of the earth where they are exposed to extreme pressures (they get squished) or temperatures (they get cooked). However, these trials make them stronger and more beautiful than ever. Some of the most popular precious and semi-precious gemstones are associated with metamorphic rocks.

Sidebar:

The Rocky Mountains are made of very old metamorphic rocks that formed deep inside the Earth and were then pushed upwards through the movement of tectonic plates. The town of Whistler near Vancouver is built on the metamorphic rock Schist.

Sidebar:

Most metamorphic rocks have taken millions of years to form. But there is one form of metamorphism that can happen very quickly.

When a meteorite hits the Earth, the heat and force of the crash changes the surrounding rocks. They instantly become metamorphic rocks. Moldavite is a rare metamorphic rock that was created when a meteorite struck what is now the Czech Republic about 15 million years ago.

Sidebar:

Schist is a metamorphic rock that can form from shale, slate, basalt, or granite. Sometimes schist can be found containing valuable minerals like garnet. Garnet is popular in jewellery. It is also the birthstone for January.

Sidebar:

One of the most famous metamorphics is diamond. Graphite and diamond are two minerals that are made entirely out of carbon. If we put graphite under a huge amount of pressure, the carbon atoms will be squeezed together and will rearrange themselves into the more compact crystal structure of diamonds.

Did You Know?

- Magma has a temperature of about 1,000 degrees Celsius (about 2,000 degrees Fahrenheit). This is five times hotter than a very hot oven.
- Most metamorphism happens about 20 kilometres (12 miles) deep in the Earth's crust.

VOLCANO

Did you know that you can see a volcano from Sidney? The cone-like profile of Mount Baker is the dominant landmark on Vancouver's southern skyline and is visible on clear days from the shore just a few metres from this spot. While surrounding lower mountains have formed by the slow uplift of the land, Mt. Baker has been built by repeated volcanic eruptions of lava and ash over the last 40,000 years. This volcano's last eruption was in the 1800s.

Pillow lava is the lava structure typically formed when lava emerges from an underwater volcanic vent. The viscous lava gains a solid crust on contact with the water and this crust cracks and oozes additional large blobs or "pillows" as more lava emerges from the advancing flow. The Sooke Potholes, on Vancouver Island's southwest coast features large pillow lava formations.