



Fire & Ice Post-Visit Activity From Magma to Sand: The History of a Rock

Objectives:

Students will:

- Investigate the rock cycle
- Describe the processes that drive geologic change such as weathering and transport

State Learning Results Addressed (Grades 5–8):

Science and Technology: F.4, F.5, L.2

Materials:

Copies of the handout

Activity:

Trace the history of an individual rock particle in the sand to its origins as magma. This can be done by having the students create a creative writing piece, skit, or art project telling the story of the rock. Students could also look at world history through the “eyes” of the rock—how have things changed over time from the rock’s perspective? Some questions that could help trace the life of the rock are attached.

Continuations:

A similar activity could be done by tracing the history of a rock found in the student’s front yard. Another alternative would be to divide the students into three groups and give each group a different type of rock (sedimentary, metamorphic, and igneous) and have them develop the story for that rock.

From Magma to Sand: The History of a Rock

Teacher Copy

This list includes some possible answers, but other answers may also be correct.

Remember looking at the sand on Sand Beach with your hand lens? The sand was made up of many different particles. Many of the particles came from shells, but some of them came from rocks. Think about the pink rock particles. Where did they come from and what brought them to Sand Beach?

How were these particles deposited on Sand Beach?

Most likely they were deposited by the ocean, but it is also possible that they came directly off the mountains with runoff.

What type of rock did they probably come from? Where is that type of rock found? (Think about where on MDI you see pink rock.)

The pink particles are the potassium feldspar found in granite. Around here, the Cadillac Mountain Granite has the most distinct pink coloration. It makes up most of the eastern half of MDI and is most visible on the summits of the eastern mountains.

So if these pink sand particles were once part of a bigger rock, what forces broke down that parent rock into small pieces? What forces transported the small pieces from the parent rock to the beach?

Granite can be weathered by wind, water, weather (such as freeze-thaw cycles), vegetation, and mechanical forces (such as being crushed by other rocks). Wind, water, and gravity then brought the particles down the mountain and into the ocean. Along the way, the rock continued to be broken into smaller pieces. Ocean currents and waves brought the particles to Sand Beach, where it was deposited.

How was the parent rock formed? (Think about what type of rock it is: sedimentary, igneous, or metamorphic.)

Granite is an igneous rock, so it was formed by the slow, subsurface cooling of magma.

Where did the material come from that formed the parent rock?

Magma is molten rock that lies under the crust. Magma is formed when rock melts due to the high temperatures and pressures found deep in the Earth. For example, rocks melt when a plate is subducted at a convergent boundary.

Will these sand particles remain sand forever? How could they be transformed again?

Most likely not. With a lot of time and some pressure to compact it, the sand could form sedimentary rock in a processes called lithification.

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Student Copy

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