

Rocks Talk!

A Blandy Experimental Farm Program

Pre Trip information for teachers

Before your students come to Blandy, they should be familiar with the following vocabulary:

- **Rocks** are naturally formed aggregates of mineral matter constituting a significant part of the earth's crust.
- **Sedimentary rocks** are formed either by cementation of rock and mineral fragments that have been eroded from existing rocks, transported and deposited in basins, or by precipitation of dissolved minerals.
- **Igneous rocks** are formed when magma cools sufficiently to become solidified. This includes magma that rises to the earth's surface to become lava in volcanoes.
- **Metamorphic rocks** are pre-existing rocks that have been changed by the effects of higher temperatures and pressures and/or chemically active fluids in the earth's crust
- **Rock Cycle:** A series of events through which a *rock* changes, over time, between *igneous*, *sedimentary*, and *metamorphic* forms.
- **Weathering:** Any of the chemical or mechanical processes by which rocks exposed to the weather undergo changes in character and break down. It contributes to the process of soil formation.
- **Erosion:** The transportation of weathered material by natural processes, such as wind.

Attached you will find a classroom handout that you can easily copy (pages 2 and 3) to help you give students a firm grasp of the rock cycle before your program at Blandy. **We suggest copying page 2 as an overhead transparency to use for class discussion.**

Inside the classroom at Blandy, we will discuss the rock cycle and the three different types of rocks (igneous, metamorphic, and sedimentary). Then students will use tools and a dichotomous key to identify common rocks such as limestone, granite, slate, gneiss, shale, sandstone, etc. To re-emphasize the concept of metamorphic rock formation, students will do an exercise matching metamorphic rocks to their parent rocks.

Students will also explore our grounds looking for evidence of erosion and weathering, and we will provide "places of interest" so that students can observe rocks in the field.

We have also attached a fun activity you might like to do with your students after you return to school (page 4 and 5). It is a fun way to learn about sedimentary rocks, and to demonstrate the process of how these rocks are formed.

We look forward to seeing you soon! Please let us know if you have any questions.

Sincerely,

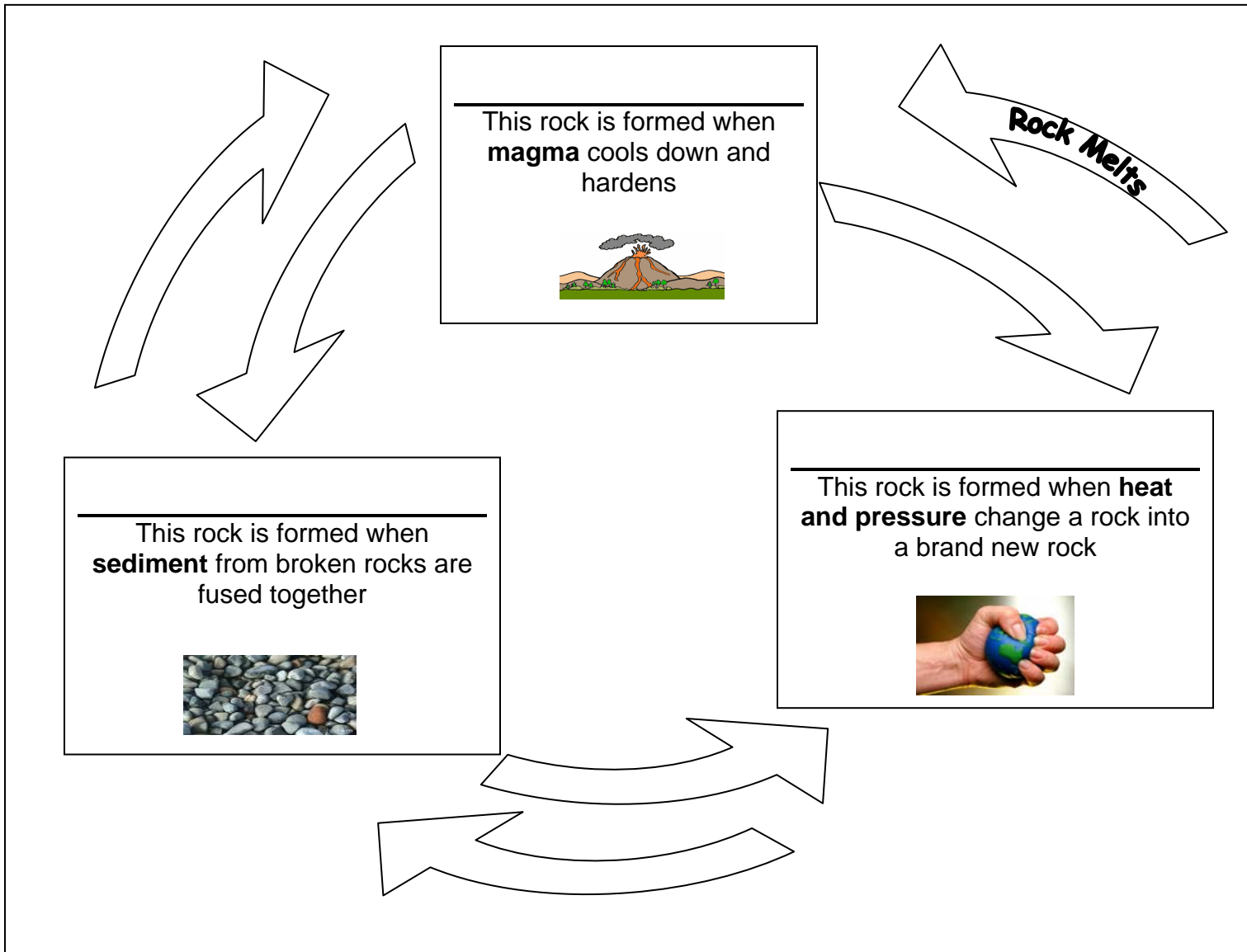
The Education Staff at the State Arboretum of Virginia



The Amazing Rock Cycle

How can we describe how rocks are formed and change through time? With the Amazing Rock Cycle!

Part 1: Fill in the blanks in the rock cycle below as you learn about the rock cycle. Use these words: **igneous, metamorphic or sedimentary**.



Part 2: Write words in the arrows to describe what is happening to the rock during that part of the rock cycle, such as in the example "Rock Melts".

Use the following phrases: **rock melts, rock is weathered, rock is buried**. You can use each phrase more than once!



Part 3: Clues for remembering rock types

For each picture clue, write in the name of the rock that is formed; igneous, metamorphic or sedimentary.



1: Like the “Mighty **Morphin’** Power Rangers”, this rock is formed by **changing** from another rock:

Example: Gneiss

See the bands that are formed when this rock was “squished” under intense heat and pressure?



2: This rock name has “**ig**” in it, which means “**fire**” (such as to *ignite*):

Example: Pumice

See how this lava cooled so *fast* that it trapped gas bubbles inside, making the rock all holey?



3: This rock is formed from **broken-up** pieces of other rocks (called **sediment**), which were broken apart by weathering:

Example: Sandstone

See the layers that were formed when sand was deposited and compacted over millions of years?



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Sedimentary Rocks Activity

Any time a rock is **weathered** (which means it is broken down into smaller parts by forces of the Earth), it leaves behind **sediment**. This sediment can be tiny pieces of rock dissolved in water, or it can be sand on a beach, or even pebbles along the bottom of a river.

If this sediment builds up in layers, and there is enough **time** and **pressure**, those layers can become fused together by minerals to form a hard, solid, sedimentary rock.

In this activity, **you** are going to supply the pressure that sediments need to become a solid sedimentary “rock”.

Materials:

3 different types of bread (white, wheat and pumpernickel (or rye) work well)
Book
Wax paper

Procedure:

1. Working in pairs, stack the bread, one slice of each kind. Each slice will represent different sediments, likely weathered from different rocks.
2. Look at the layers. Can the sediment (bread) still be separated easily?

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3. Pile the bread again on top of a sheet of wax paper on the floor. Cover the bread with another sheet of wax paper and place a book on top. (The waxed paper will protect the floor and the book).
 4. Each lab group member should stand on the book for 2 minutes. Each minute represents a million years of pressure!



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5. Remove the sediment (bread) layers from beneath the book. Can they be separated easily now? Explain:
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6. With a plastic knife or ruler, slice the bread carefully into pieces. Look at the cross sections of bread.

7. Draw a diagram of the layers of “sediment” that you observe.

8. Explain in detail what happened to the layers of bread.
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Question: In nature, where do you think the pressure comes from to create real sedimentary rocks?

