DIY Air Force Activities:

Rock Cycle Research

Materials:

- empty egg carton
- cereal bowl
- vinegar
- nail
- magnet
- smooth cement
- rocks!
- pen or pencil
- small notebook or paper

*You can use a magnifying glass to examine rocks if you have one!

Rocks come in all shapes and sizes! They are constantly changing. Scientists who study rocks are called geologists, and they can gain a lot of information about the history of the earth by looking at rock formations. Geologists study the earth, the structure of the materials that make it up, and the processes acting upon it that make it change. The following activity will introduce you to some basic geology! Geologists classify rocks by how they are made or formed. There are three major types: igneous, metamorphic, and sedimentary (see back of sheet for more details). These types are the foundation of the rock cycle. Rocks are constantly changing and moving through the cycle. This change happens very slowly, and can take millions of years. The rocks you find each day are really part of the earth's history! In today's activity we will go on an adventure to collect some rocks of our own, then take a look at the three main types of rocks and see if we can recognize them in our collection. You can also collect rocks when you visit different ecosystems, like beaches, forests, lakes, rivers, and open fields. Compare these rocks to the ones in your neighborhood! We will also learn how to do a test for a specific type of sedimentary rock called limestone.

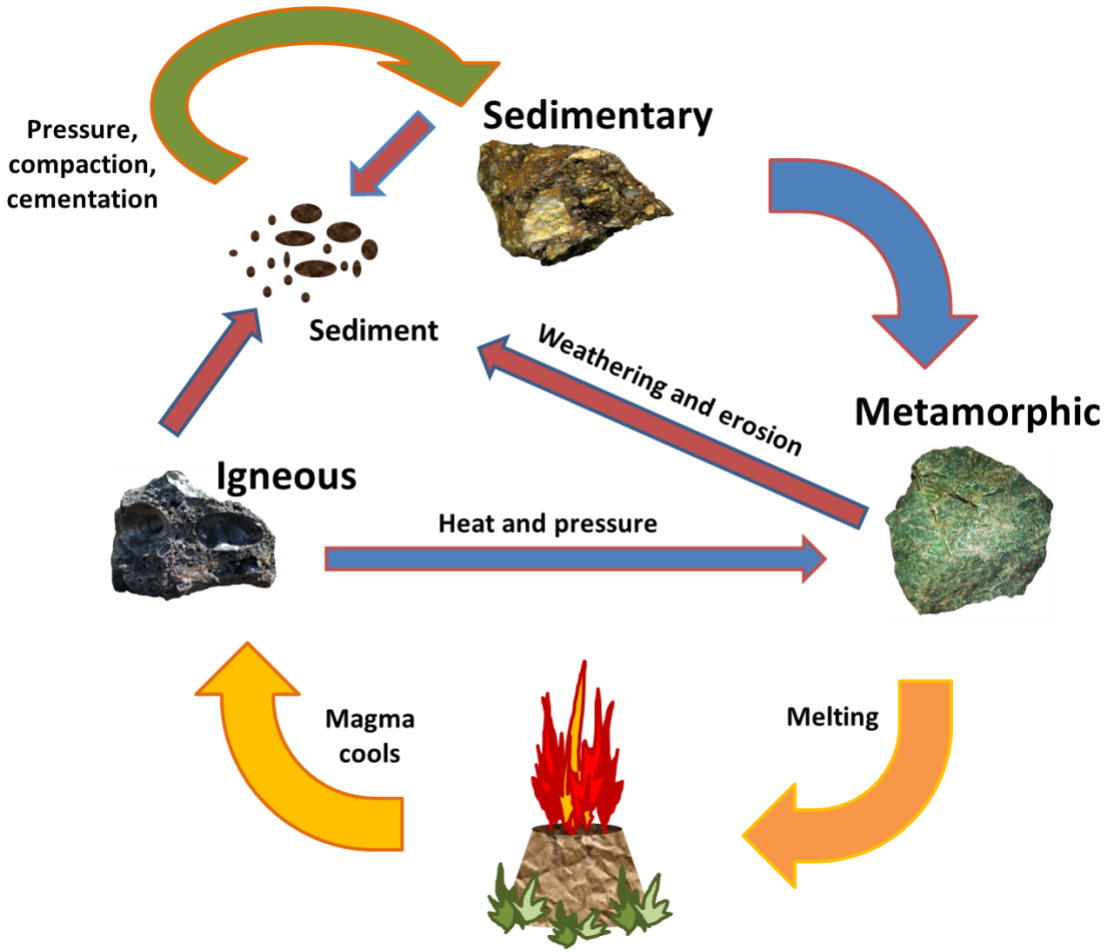
Directions:

1. Number the slots in your egg carton.
2. Have an adult help you explore outside to find rocks from different places in your yard or neighborhood. If possible go for a hike! When you find a rock, place it in your egg carton and label the lid above that space with the location you found it.
3. When you get home, clean your rocks off and look at each closely. What makes each unique? Can you scratch them with the nail? What happens when you rub them on the cement, do they leave a mark? Where did you find the rock? Are the edges smooth or jagged? Write down the number from your carton and record your observations on your paper or in your notebook.

To learn more about the types of rocks and how to classify them, look for information on the rock cycle, fossils, minerals, and Mohs Scale. There are also awesome and affordable rock testing kits online!

Air Force Associations:

Military geology is a branch of geology that studies the geological structure of terrain to evaluate the conditions for military purposes. These scientists will evaluate possibility of terrain, organization of troop water supply, and determine the requirements to fortify structures, create airfields, roads, and bridges. Although Napoleon Bonaparte was the first to employ geologists in military operations in 1798, military geologists were not deployed in the battle field until World War I.



Igneous: These types of rocks are formed when the molten magma from the core of the earth cools and hardens. When it cools slowly, sometimes small crystals are formed and the rock glitters. When it cools quickly, the surface is shiny and smooth. Gas bubbles may also become trapped, leaving tiny spaces or holes in the rock.

Metamorphic: These rocks are formed under the earth's surface over hundreds of years. Intense pressure and heat squeeze particles and fuse them together. You may observe layers in the rock, or crystals formed by minerals growing over time on the surface.

Sedimentary: These rocks are formed when sediment (small particles, sand, shells, and bone) accumulate in layers and become cemented, or stuck, together. These rocks are usually softer and break apart and scratch more easily. You may even find fossils in sedimentary rocks! To check, have an adult break the rock apart.

Rocks are broken down by weathering and erosion (see our Erosion Experiment DIY) and the cycle begins again! Rocks may change from one type to another over millions of years. The same type of rocks can be made of different materials or minerals, making each rock unique and special!

Limestone test:

Limestone is a type of sedimentary rock that contains fragments of bones and shells, which are made of calcium carbonate. This material reacts with vinegar (an acid) and creates carbon dioxide gas! This makes it simple to test if a rock is made of limestone! Limestone is usually tan or yellow and has layers. These rocks may even have fossils! To test:

1. Place the rock in your bowl or dish (glass or ceramic is best, avoid metal).
2. Pour a small amount of vinegar on the rock (cover it halfway) and make observations. Did the rock bubble or fizz? If the answer is yes, you have found some limestone and the bubbles are the carbon dioxide gas!

To learn more about acids and bases try our pH Indicator DIY.