

Rocks and Minerals

5th Grade

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Benchmark and SLC#:

SLC 12: A. Students will classify rocks by their characteristics.

Objectives:

Students will classify rocks by their characteristics; learn different types of rocks, and how rocks and minerals are used in everyday items.

Materials:

- Rocks and Minerals Packet for each student
- Box of rocks for each group/table
- One rock for each student
- Magnifying glass
- Vinegar
- Pennies
- Butter Knives (dull)
- Steel Nails
- Glass
- Crystalline minerals
- Magnets

Day 1

Initial Observation:

Break the class up into groups. Give each group a box of rocks each. Using the “Rock n’ Rule!” worksheet, the groups are to sort the rocks into two categories, labeling each circle and writing the total number of rocks in each circle. Students then create three categories with the “Rock n’ Rule II!” worksheet.

Target Observations:

- Rocks can be sorted into two groups by shape or size (i.e. round vs. square, small vs. big)
- Rocks can be sorted into two groups by color, texture, or hardness

Target Model:

-Rocks can be sorted by shape, size, color, texture, or hardness.

Procedure:

Pass out the “How are Rocks different?” worksheet. Ask each student to pick three rocks to use as A, B, and C. Have the students fill out the worksheet.

Target Observations:

- The rocks have different colors, textures, stripes, and shininess.

Procedure:

Show the students the crystalline minerals. What is different about these crystals from regular rocks? If you look really close, what are rocks made of? Think of sandstone – it is just a

bunch of sand stuck together. But what does sand look like up close? The crystals don't have to be the same in a rock – they can change. The crystals are called **minerals**.

Target Observations:

- The minerals are big crystals
- Rocks are not big crystals, but are made up of really small crystals
- Sand is a bunch of small crystals; sandstone is a bunch of small crystals stuck together

Target Model:

-Rocks can be sorted by shape, size, color, texture, or hardness.

-Minerals can be rocks, and rocks are made of minerals. Not every rock is only one mineral. Some rocks have lots of different types of minerals in them.

Discussion:

This would also be a good opportunity to talk about if rocks are alive, plants or animals. Ask the students why we study the earth and its life, especially as recorded in rocks.

Day 2:

Discussion:

Review with the students the different ways they sorted their rocks. Discuss with them that scientists have three main categories they classify their rocks in to. Read through the sedimentary, igneous, and metamorphic sheets discussing how they are made and how long they take to be made. Look at the rock cycle to see how all the rocks are tied together and without one element, it would throw the whole cycle off.

Target Model:

-Rocks can be sorted by shape, size, color, texture, or hardness.

-Minerals can be rocks, and rocks are made of minerals. Not every rock is only one mineral. Some rocks have lots of different types of minerals in them.

-Scientists sort rocks into sedimentary, igneous, and metamorphic rocks because of the different ways the rocks are made.

Discussion:

Discuss with students how a rock key works. Do at least one example of keying a rock and review the three types of rocks they could have. Explain to students the importance of a hardness test, how to do it, and what it tells us. Students then are given their own rock to perform tests 1 through 6 in Like A Rock. Discuss different characteristics of everyone's rocks and how scientists use these tests for history of land (looking at aging and fossils) and for creating things we use everyday.

Day 3:

Discussion:

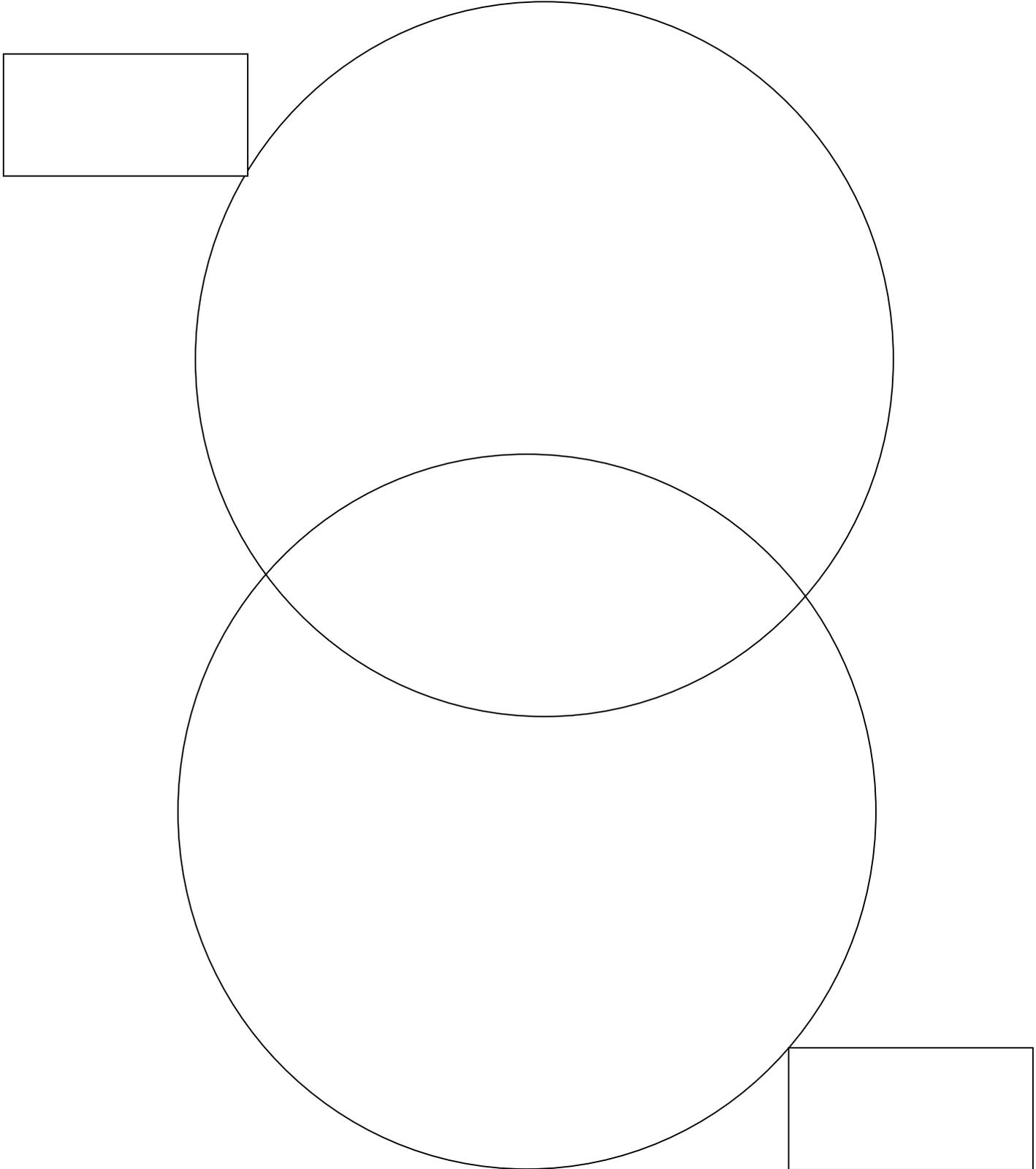
Do we need rocks and minerals in our everyday life? Where are these rocks and minerals? In what types of objects? Review “Rocks and Minerals in Everyday Things” sheet with the students. Where are some minerals in the classroom?

Target Model:

- Rocks can be sorted by shape, size, color, texture, or hardness.
- Minerals can be rocks, and rocks are made of minerals. Not every rock is only one mineral. Some rocks have lots of different types of minerals in them.
- Scientists sort rocks into sedimentary, igneous, and metamorphic rocks because of the different ways the rocks are made.
- Rocks and minerals are in many of the things we use everyday.*

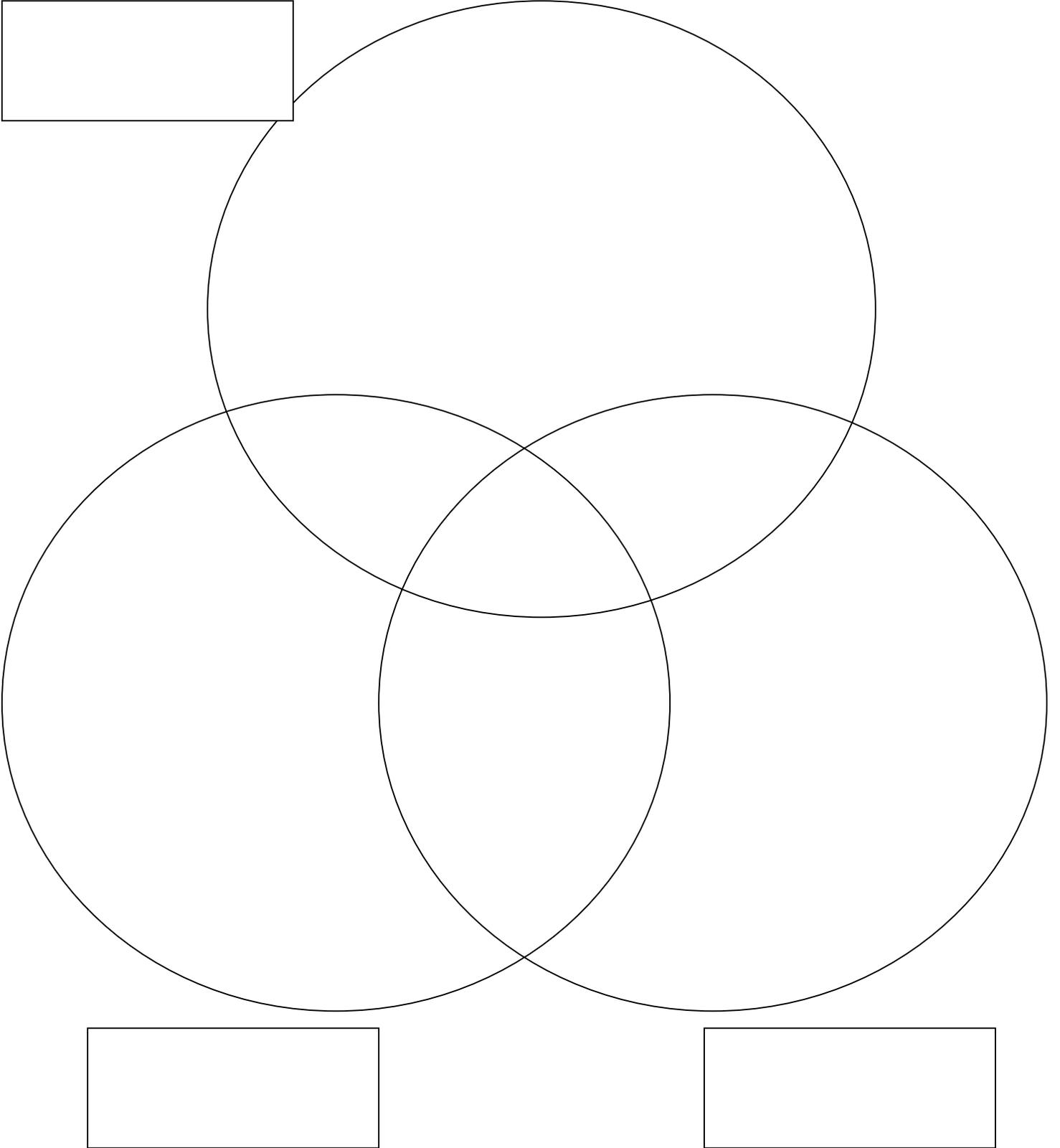
Rock 'n' Rule!

Choose your own rules and sort your rocks. Label both circles.



Rock 'n' Rule Part 2!

Choose 3 rules and sort your rocks. Label your circles.



How are Rocks Different?

-Pick out 3 rocks from your collection. Make sure they come from 3 different sections on your Rock 'n' Rule Venn diagram. Place one rock on each letter. Describe each rock by filling in the chart.

Rock	Color	Color and shape of minerals	How does it feel?	Does it have stripes?	Is it dull or shiny?
A					
B					
C					

Now, complete these sentences about your rocks. Describe each rock in **2** ways.

I like Rock A because _____

The prettiest thing about Rock B is _____

I chose Rock C because _____

My favorite rock is Rock _____ because _____

Like a Rock!

Test 1: Identification

Use the rock identification key to figure out if your rock is igneous, metamorphic, or sedimentary.

Rock Type: _____

Test 2: Hardness

Here are the minerals Moh used to determine his hardness scale:

Diamond	10
Corundum	9
Topaz	8
Quartz	7
Orthoclase (Feldspar)	6

Aptite	5
Fluorite	4
Calcite	3
Gypsum	2
Talc	1

Find out how hard your rock is by trying these tests and seeing where it falls on the scale.

If your rock...	Give it a hardness number...
Can be rubbed off on the fingers	1
Can be scratched with a fingernail	2
Can be scratched with a penny	3
Can be scratched easily with a butter knife	4
Is hard to scratch with a butter knife	5
Can be scratched with a nail	6
Can easily be used to scratch glass	7
Can be scratched with a steel file	8

Scale Number: _____

Which mineral from Moh's scale does your rock match up with?

Test 3: Description

Look at your rock carefully. Look at the color, the crystals, and any other features. Draw your rock as detailed as you can below.



Test 4: Magnification

Use the hand lenses to look at your rock. Draw a detailed view of your rock under magnification.



Test 5: The vinegar test

Put your rock in a cup of vinegar. Let it sit for a while. Describe what happened.

Test 6: The Magnet Test

Use the magnet to test if your rock contains magnetic material. Describe what happened.

Rocks & Minerals in Everyday Things

Here is a list of everyday items, and some of the rocks and minerals that make them up!

Battery: antimony, cadmium, lead, zinc

Bicycle: aluminum, clay, diatomite, mica, sulfur, selenium, wollastonite, zinc

Book: clay, limestone, sodium sulfate, feldspar

Brick: bauxite, chromite, zircon, silica, graphite, kyanite, andalusite, sillimanite, clays

Car: platinum, iron, aluminum, lead, coal, barite, boron, calcium carbonate, bentonite, silica, chromium, perlite, wollastonite, mica, industrial diamonds, zeolite, clays

Carpet: limestone, selenium, lime, soda ash, zeolites, bentonite, titanium, sulfur, diatomite, petroleum

Caulking: limestone, gypsum

Cement: limestone, gypsum, iron, clays, diatomite, feldspar

Chalk: limestone

Clothing: boron, halite, molybdenum, sulfur

How Metamorphic Rock Is Formed



Metamorphic rocks are rocks that have "morphed" into another kind of rock. These rocks were once igneous or sedimentary rocks. How do sedimentary and igneous rocks change? The rocks are under tons and tons of pressure, which fosters heat build up, and this causes them to change. If you exam metamorphic rock samples closely, you'll discover how flattened some of the grains in the rock are.

Schist Rocks



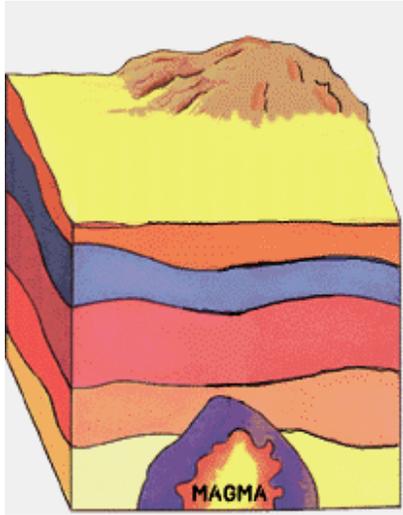
Schist rocks are metamorphic. These rocks can be formed from basalt, an igneous rock; shale, a sedimentary rock; or slate, a metamorphic rock. Through tremendous heat and pressure, these rocks were transformed into this new kind of rock.

Gneiss Rocks



Gneiss rocks are metamorphic. These rocks may have been granite, which is an igneous rock, but heat and pressure changed it. You can see how the mineral grains in the rock were flattened through tremendous heat and pressure and are arranged in alternating patterns.

How Igneous Rock Is Formed



Igneous rocks are called fire rocks and are formed either underground or aboveground. Underground, they are formed when the melted rock, called magma, deep within the earth becomes trapped in small pockets. As these pockets of magma cool slowly underground, the magma becomes igneous rocks.

Igneous rocks are also formed when volcanoes erupt, causing the magma to rise above the earth's surface. When magma appears above the earth, it is called lava. Igneous rocks are formed as the lava cools above ground.

Granite Rocks



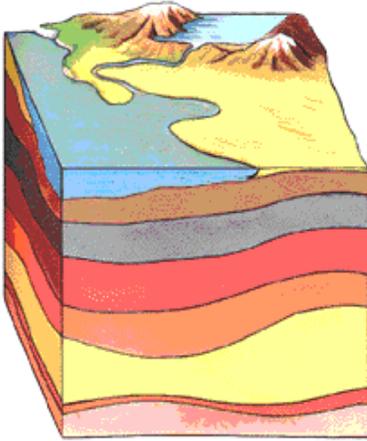
Granite rocks are igneous rocks which were formed by slowly cooling pockets of magma that were trapped beneath the earth's surface. Granite is used for long lasting monuments and for trim and decoration on buildings.

Pumice Rocks



Pumice rocks are igneous rocks, which were formed when lava cooled quickly above ground. You can see where little pockets of air had been. This rock is so light, that many pumice rocks will actually float in water. Pumice is actually a kind of glass and not a mixture of minerals. Because this rock is so light, it is used quite often as a decorative landscape stone. Ground to a powder, it is used as an abrasive in polish compounds and in Lava© soap.

How Sedimentary Rock Is Formed



For thousands, even millions of years, little pieces of our earth have been eroded--broken down and worn away by wind and water. These little bits of our earth are washed downstream where they settle to the bottom of the rivers, lakes, and oceans. Layer after layer of eroded earth is deposited on top of each. These layers are pressed down more and more through time, until the bottom layers slowly turn into rock.

Limestone Rocks



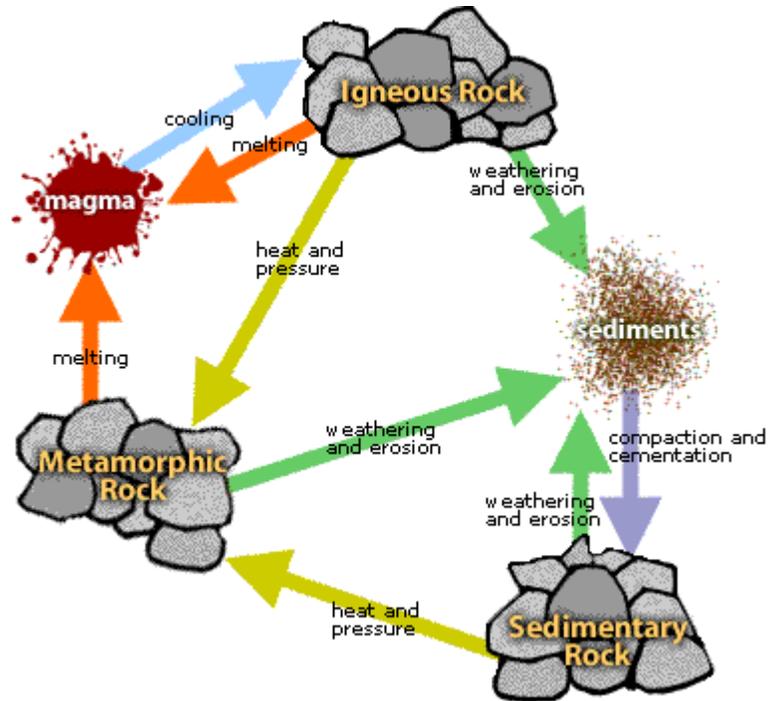
Limestone rocks are sedimentary rocks that are made from the mineral calcite which came from the beds of evaporated seas and lakes and from sea animal shells. This rock is used in concrete and is an excellent building stone for humid regions.

Shale Rocks



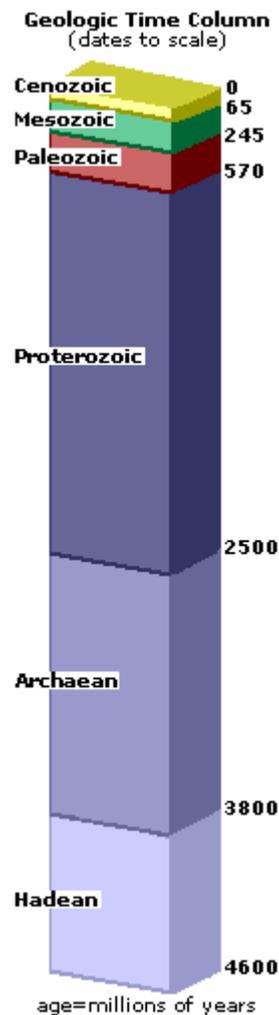
Shale rock is a type of sedimentary rock formed from clay that is compacted together by pressure. They are used to make bricks and other material that is fired in a kiln.

The Rock Cycle



Above is a **rock cycle**. It is similar to the water cycle, but uses rocks. When reading this chart the arrows are read like “turns in to.” For example: Igneous rock turns in to sediment (because of weathering and erosion).

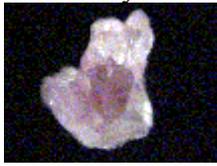
Once we have figured out what kind of rock it is, we date the rock. This lets us know what the land was made up of when that rock was formed. This time chart to the right shows how many years ago different rocks were formed (in millions of year!!!).



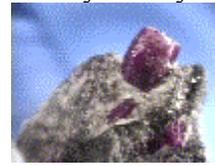
Birthstones

(Minerals or gemstones you might know!)

January –Rose Quartz



July –Ruby



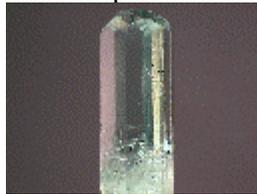
February –Amethyst



August -Peridot



March –Aquamarine



September -Sapphire



April –Diamond



October -Opal



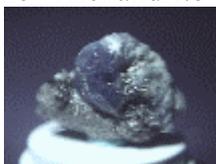
May –Emerald



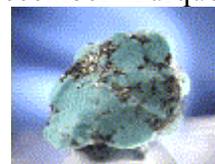
November -Topaz

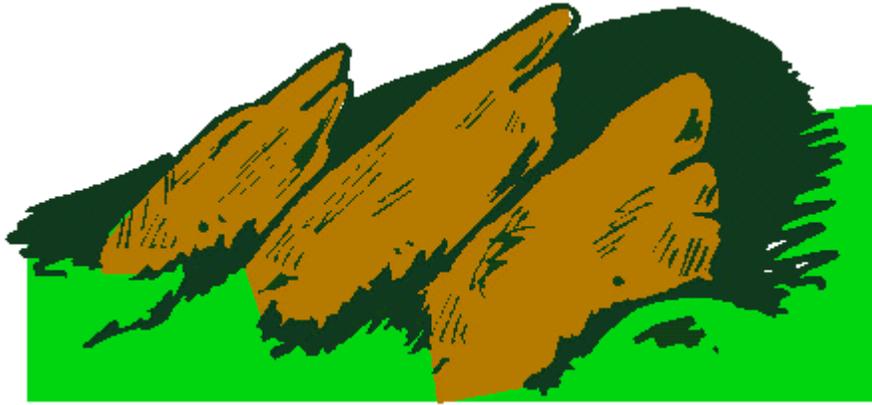


June –Alexandrite

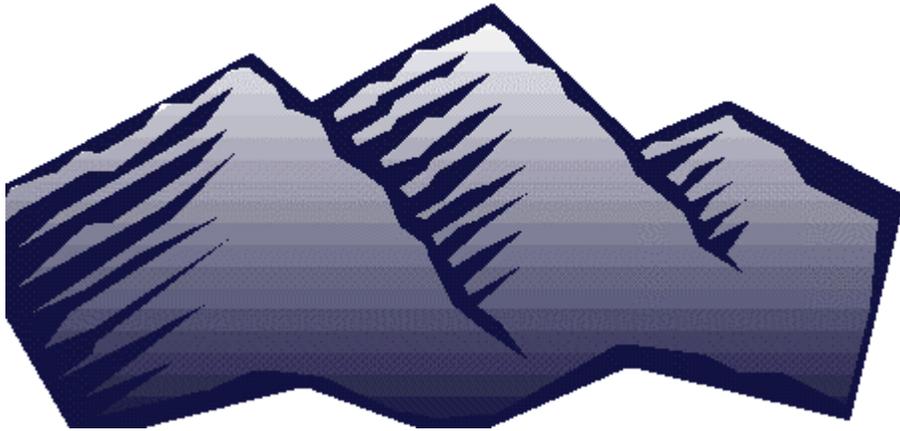


December -Turquoise





Rocks and Minerals!!!



Name: _____