

# The Rock Cycle

## Objectives:

- Define Geology
- Explain uniformitarianism
- Describe the three main groups of rocks
- Explain the rock cycle

## Geology

- Root words:

- “Geo” means Earth
- “logos” means study of



Geology then literally means “Study of Earth”.

In a more academic sense, **Geology is the study of the structure of the planet Earth and the forces that make and shape the Earth.**

## • Principle of uniformitarianism

- Do rocks last forever?
- Does the Earth look the same as it did thousands of years ago?
- When did the surface of the Earth start changing?
- What evidence do we have that the Earth has changed?

In the 1700, a Scottish doctor and farmer named James Hutton studied the rocks and landscape around him trying to answer these questions.



Geologic processes that operate today also operated in the past.

For example:

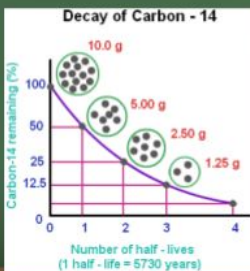


The way to get an A in Social Studies is the same as the way to get an A in Science (study and participate).

Your grown-ups will get equally upset with you and your sibling for playing on your DS after bedtime.

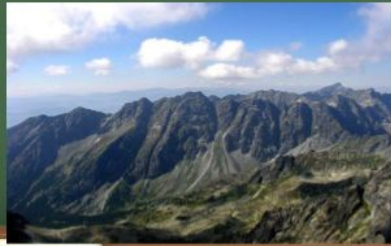


The rates of erosion of a piece of exposed sandstone are the same now than when it was formed (this allows us to estimate age).



The rate of radioactive decay of  $^{14}\text{C}$  is the same now than 4.6 billion years ago (again allowing us to estimate age)

The process that formed the Tatra Mountains in Slovakia is the same process that formed the Rockies in the US.



Key question

**How does uniformitarianism help geologists understand Earth's history?**

- Think for 30 seconds.
- Turn to your neighbor and explain (be ready to share out) (1 minute)

## • Types of Rocks

Geologists classify rocks into three main groups:

- **Igneous** – made through fire



- **Sedimentary** – made through settling



- **Metamorphic** - made through change



## Igneous Rock

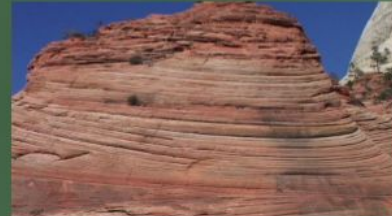
Igneous rocks form when molten material from beneath the Earth's surface cools and hardens.

- Granite (left) and obsidian (right) are both igneous rocks. These two were found in basically the same spot of the Sierra Nevada at roughly the same location and have the same basic composition.
- Why are they so different?
- Think – tell your neighbor – share out.



## Sedimentary rock

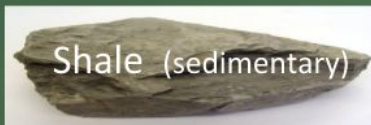
Sedimentary rock is made of sediments that have been deposited and then pressed together to form solid rock.



Why are most fossils found in sedimentary rocks?

## Metamorphic rock

Metamorphic rock forms when an existing rock is changed by heat, pressure or chemical reactions



Shale (sedimentary)

+ heat and pressure =



Slate



Basalt (igneous)

+ heat and pressure =

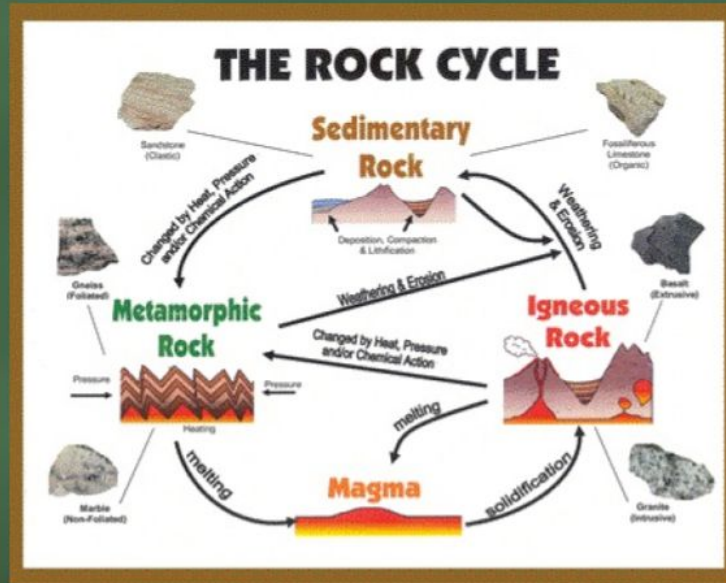


Greenstone

# The Rock Cycle

The rock cycle is a series of processes on and beneath the Earth's surface that slowly change rocks from one kind to another.





## Play the Rock Cycle game:

As you travel through the rock cycle, keep track of where you went, how you got there, and what happened. You will use this information to draw a cartoon.