

Rocks and The Rock Cycle

A wide-angle photograph of a desert canyon landscape, likely Bryce Canyon National Park. The scene is dominated by numerous orange-red rock spires and hoodoos, characteristic of the region's sedimentary geology. The terrain is rugged and layered, with various shades of red, orange, and tan. In the foreground, there are some dark green pine trees on the right side. The background shows a vast, hazy landscape under a clear sky. The text "Rocks and The Rock Cycle" is overlaid in white across the center of the image.

ROCKS!

There are 3 types:

1) Igneous - "Fire" melted rock cools and hardens

- Cools slowly = Large crystals

- Cools quickly = No crystals

examples: Granite, Obsidian, Pumice, Basalt



Formation and Texture

- **Intrusive** – forms under the Earth's surface
 - Large grain → magma cools slowly and large crystals form
- **Extrusive** - forms on top of the Earth's surface
 - Small grain → magma cools too quickly and small or no crystals form



Extrusive



Intrusive

2) Sedimentary - Made up of sediments (like mud and sand) and pieces of other rocks that have been broken apart.

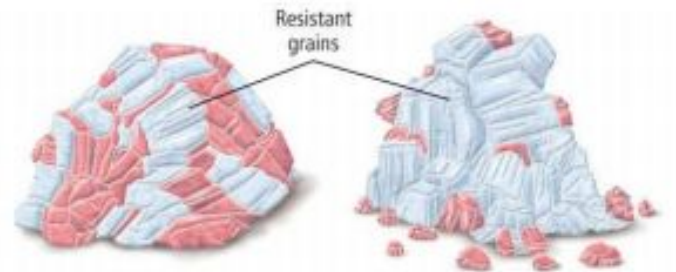
- Pieces are "cemented" together by pressure from layers above.

examples: Sandstone, Limestone, Shale, Coal



Weathering and Erosion

- **Weathering** – the set of physical and chemical changes that breaks rocks into smaller pieces
- Size can range from microscopic to huge boulders.
- Physical weathering → rock fragments break off
- Chemical weathering → minerals in a rock are dissolved or are chemically changed



Weathering and Erosion

- **Erosion** – the removal and transport of sediment
- Four Main Agents:
 - Glaciers
 - Wind
 - Water
 - Gravity
- For these reasons eroded sediment will eventually wind up downhill

Deposition and Sorting

- Occurs when sediments settle on the ground or sink to the bottom of water (deposition)
- Usually large grains will settle to the bottom and finer grains on top (sorting)

- Sorted deposits → water and wind
- Unsorted deposits → glaciers and mudslides

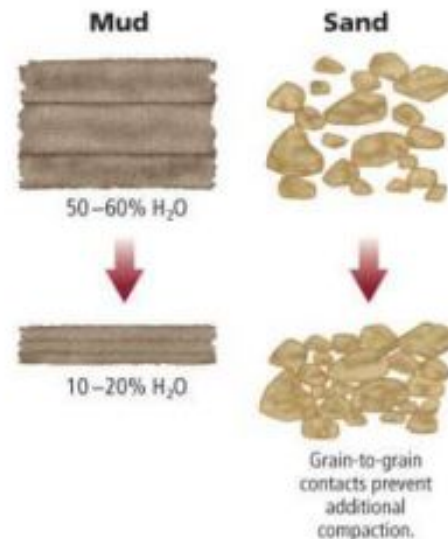
Lithification

- Most sediments wind up at low points (valleys or bottom of ocean basin)
- As sediment builds up, pressure and temperature increase in bottom layers
- This leads to compaction and cementation!

Lithification

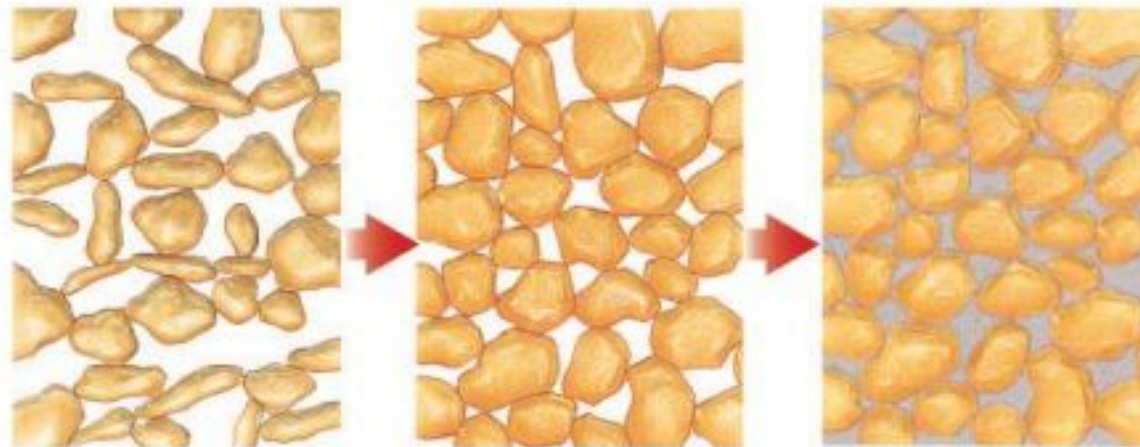
Steps in Lithification:

- 1. *Compaction*** – layers of sediment are pushed together
 - Some materials compact better than others



Lithification

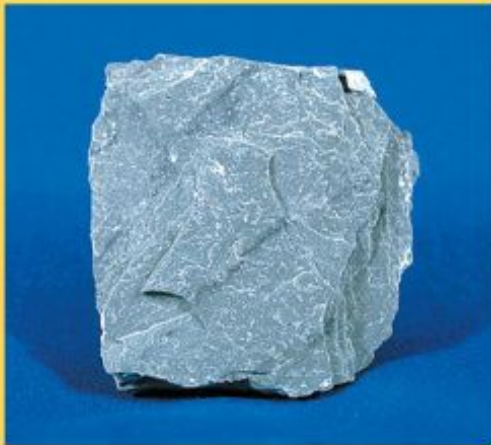
2. *Cementation* – mineral growth glues sediments together into solid rock



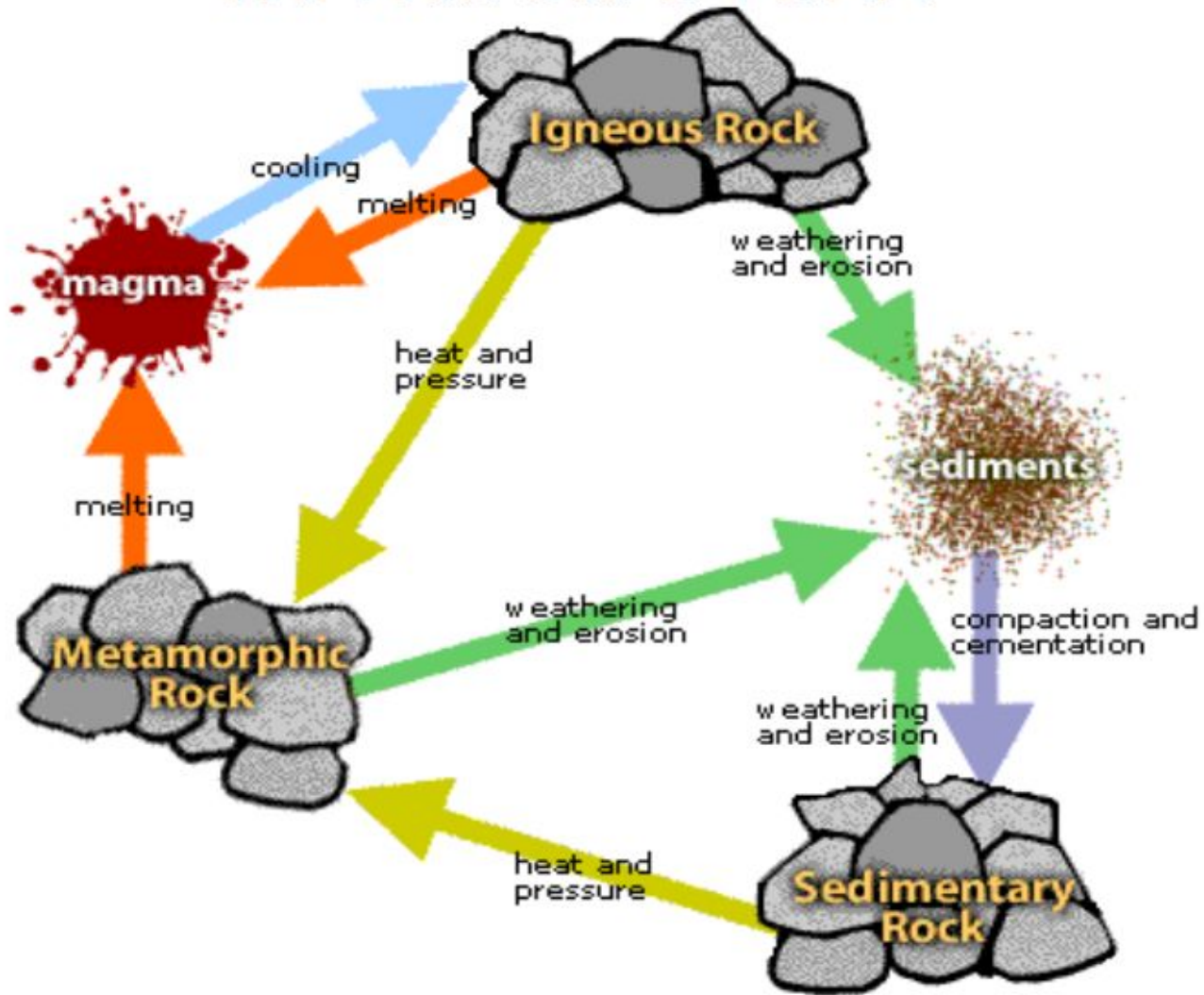
3) Metamorphic - Heat and pressure change the chemical makeup of a rock

- Minerals that make up the rock might change or form larger crystals

examples: Slate, Quartzite, Marble, Gneiss



THE ROCK CYCLE



Soil - Made up of rock fragments, humus (decayed plant and animal matter), air, and water

Loam - A kind of soil that contains about the same amount of clay, silt, and sand.



Particle Size



SAND



SILT



CLAY

If a particle
of **sand** were
the size of a



basketball,

then **silt** would
be the size
of a



baseball,

and **clay**
would be the
size of a



golf ball.



Soil Found In PA

- 1. Glacial Till - Mix of clay and rock particles found in northwest PA**
- 2. Sandy Loam - Very sandy, good for gardens. Found in north-central PA and the Allegheny Plateau**
- 3. Silt Loam - Found around rivers, good for agriculture because it's very fertile. Found in southwest and central PA**
- 4. Coastal Sand - Big sand particles. Found around Philadelphia**