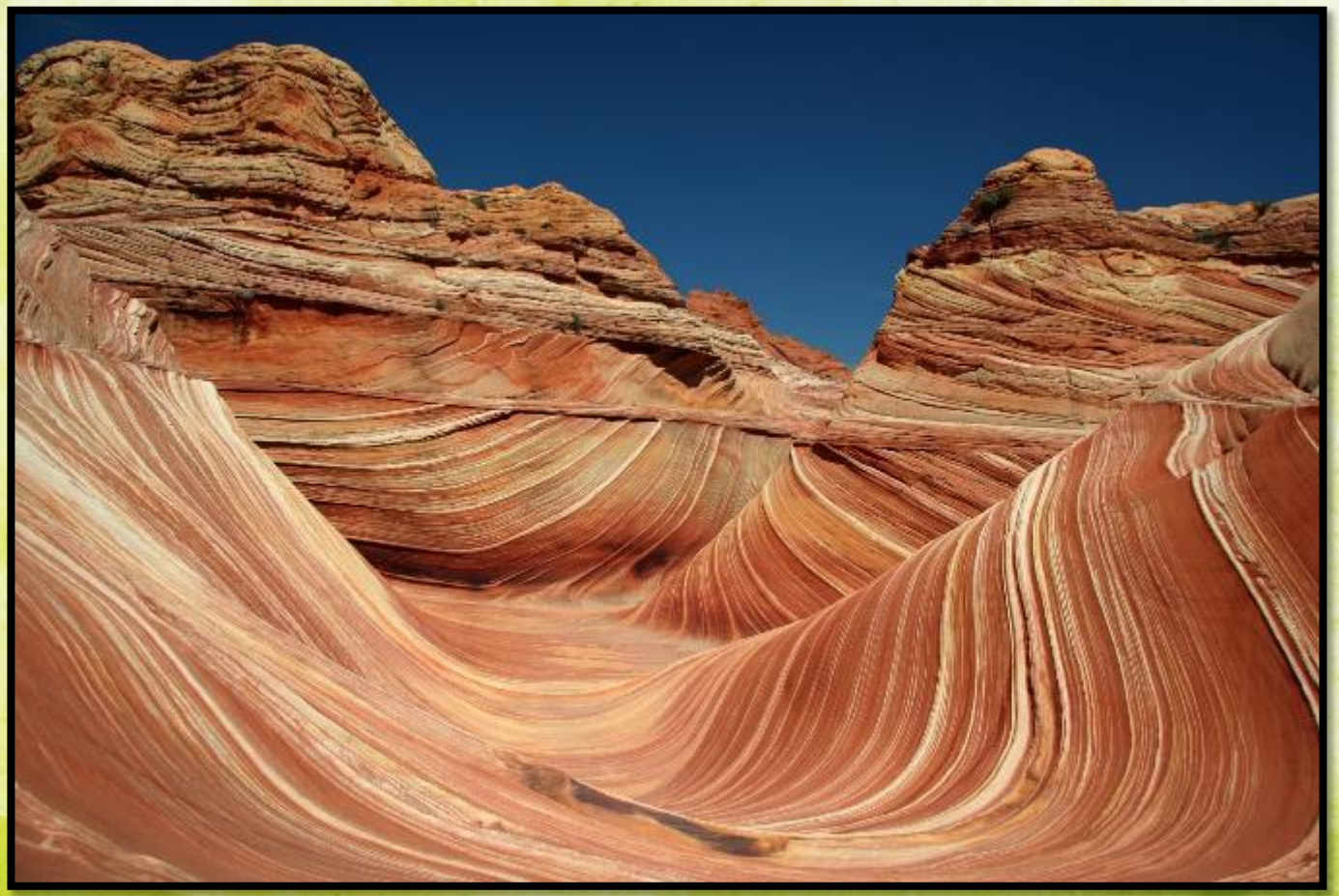
EARTH'S CHANGING SURFACE



Uniformitarianism

Uniformitarianism

James Hutton came up with the idea in the 1700's

The present is the key to the past.

He said that there are slow, natural processes that changed, and continue to change, the planet's landscape or surface.

For example, given enough time, a stream could erode a valley, or sediment could accumulate and form a new landform.

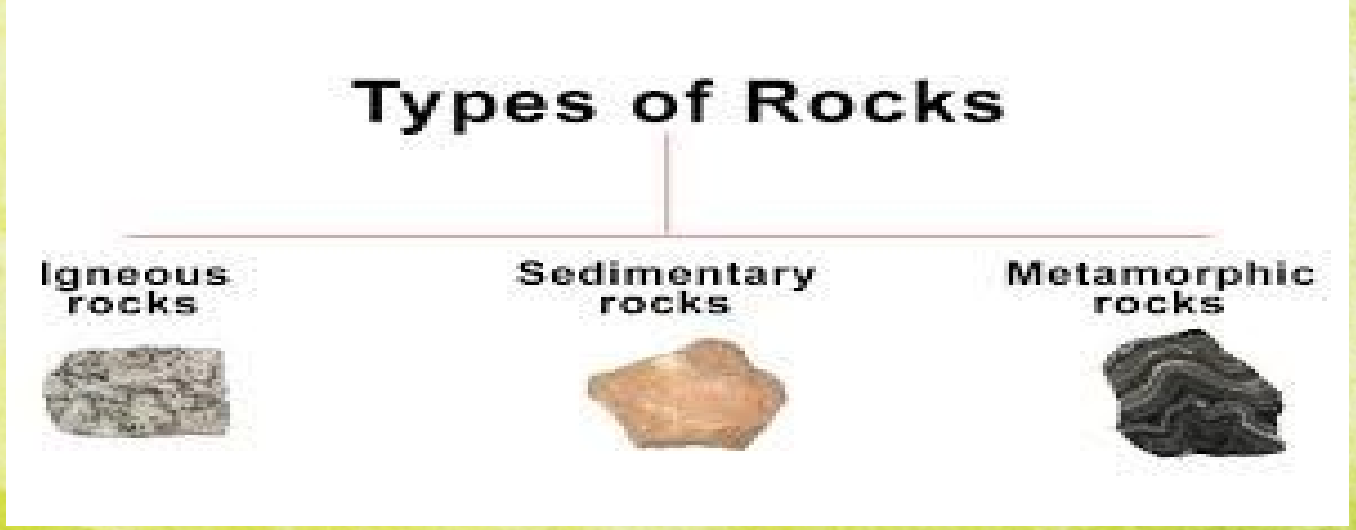
Some of the processes include:

a. the rock cycle
b. weathering
c. erosion, and
d. movement of glaciers

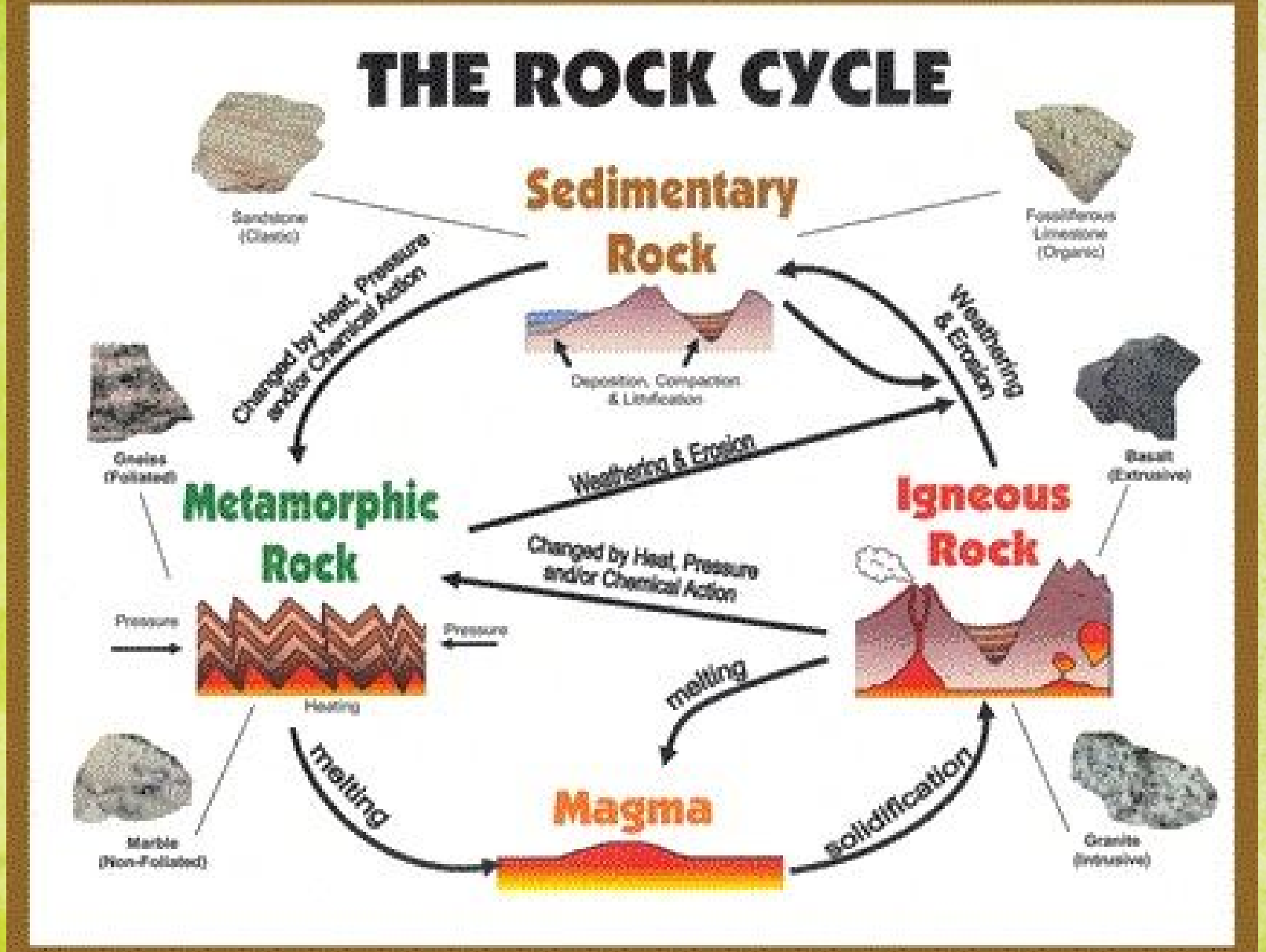
The Rock Cycle

Rock Cycle

- series of processes that change one type of rock into another type of rock
- 3 main types of rocks



THE ROCK CYCLE



Weathering

weathering – process that breaks down rock based on regular weather patterns such as
snow, rain, wind, hot temperatures and cold temperatures

Weathering

When it rains, water accumulates (collects) on the ground and in rocks, if it is cold, that rock may freeze and expand and over time will break down rock

Regular rain water slowly dissolves minerals that can change shape of rocks

Oxygen reacts with iron rich rocks and rusts them

Weathering

There are ways the rate (speed) of weathering can be changed:

- climate – weathering occur faster in wet climates
- type of rock – some minerals dissolve faster than others

Erosion & Deposition Water and Wind

Erosion

erosion – process by which natural forces move weathered rock, or sediment, from one place to another

Deposition

deposition – the laying down or settling of eroded material

Water Erosion & Deposition

Moving water is a major agent of erosion, especially along rivers, at beaches, and underground.

- river – active water channel, that form on mountain slopes, that erodes land and transports sediment (small pieces of rock)

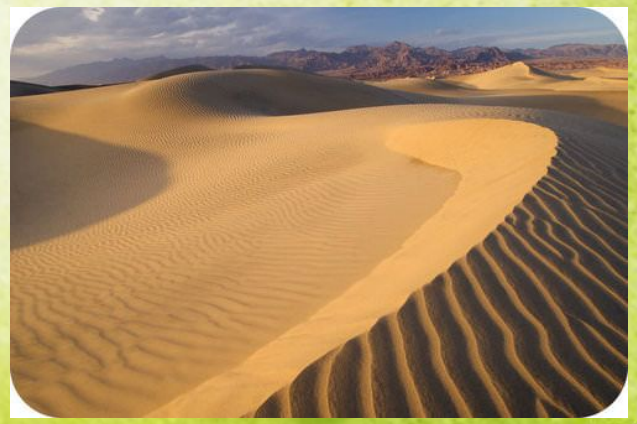
waves – shape the coastlines through erosion by breaking down rock and transporting sand and other sediment; erode land by impact of great force and abrasion, or grinding away at shore

- beach – area of deposited sediment carried in by a wave

Wind Erosion and Deposition

- Wind causes erosion by deflation (moving loose sediments), **or** the process by which wind removes surface materials by abrasion.

- A common type of wind-blown deposit is a dune, piles of wind-blown sand



Erosion & Deposition: Glaciers

Glacier

glacier – large mass of ice that formed on land and moves slowly across Earth's surface; form in areas where the amount of snowfall is greater than the amount of snowmelt

- continental glacier (or ice sheets) – covers large areas of land and move outward from central location; exist today on Antarctica and Greenland

- valley glacier (alpine) – long, narrow glacier that forms when snow and ice build up high in a mountain valley

How Glaciers Shape the Land

Two processes by which glaciers erode the land and plucking and abrasion.

plucking occurs when a glacier flows over the land, it picks up rocks and large boulders dragging them across the land, causing abrasions, or gouges and scratches in the bedrock

Glacial Depositions

When a glacier melts, it creates various landforms which include:

- till – mixture of sediment that is deposited directly on the surface
- moraine – ridge formed from till deposited at the edge of glaciers