

# Rock Cycle and Layers

Introduction for Parts 1 & 2

# Teacher slide!

- Part 1

- > Rock Types

- > Rock Cycle

**Slides 1-13**

- Part 2

- > Rock Layers

**Slides 14-17**



# Rocks

# Types of Rocks

- There are 3 types of rock:
  - > **Igneous**
  - > **Metamorphic**
  - > **Sedimentary**



# Igneous Rocks



- Formed from magma or lava from a volcano
  - > **Intrusive igneous rocks** – formed from magma cooling slowly within the Earth
  - > **Extrusive igneous rocks** – formed from lava cooling quickly on the Earth's surface



Granite

**Intrusive**



Basalt

**Extrusive**

# Metamorphic Rocks

- Formed as one rock type changes into another due to high pressure and heat
  - > **Foliated metamorphic rock – have layers or bands**
  - > **Non-foliated metamorphic rock – no layers or bands**



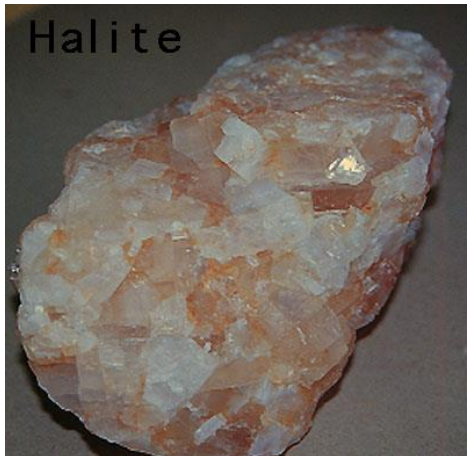
**Foliated**



**Non-foliated**

# Sedimentary Rocks

- Form from the compaction of sediments such as rock pieces, mineral grains and shell fragments



# Rock Cycle

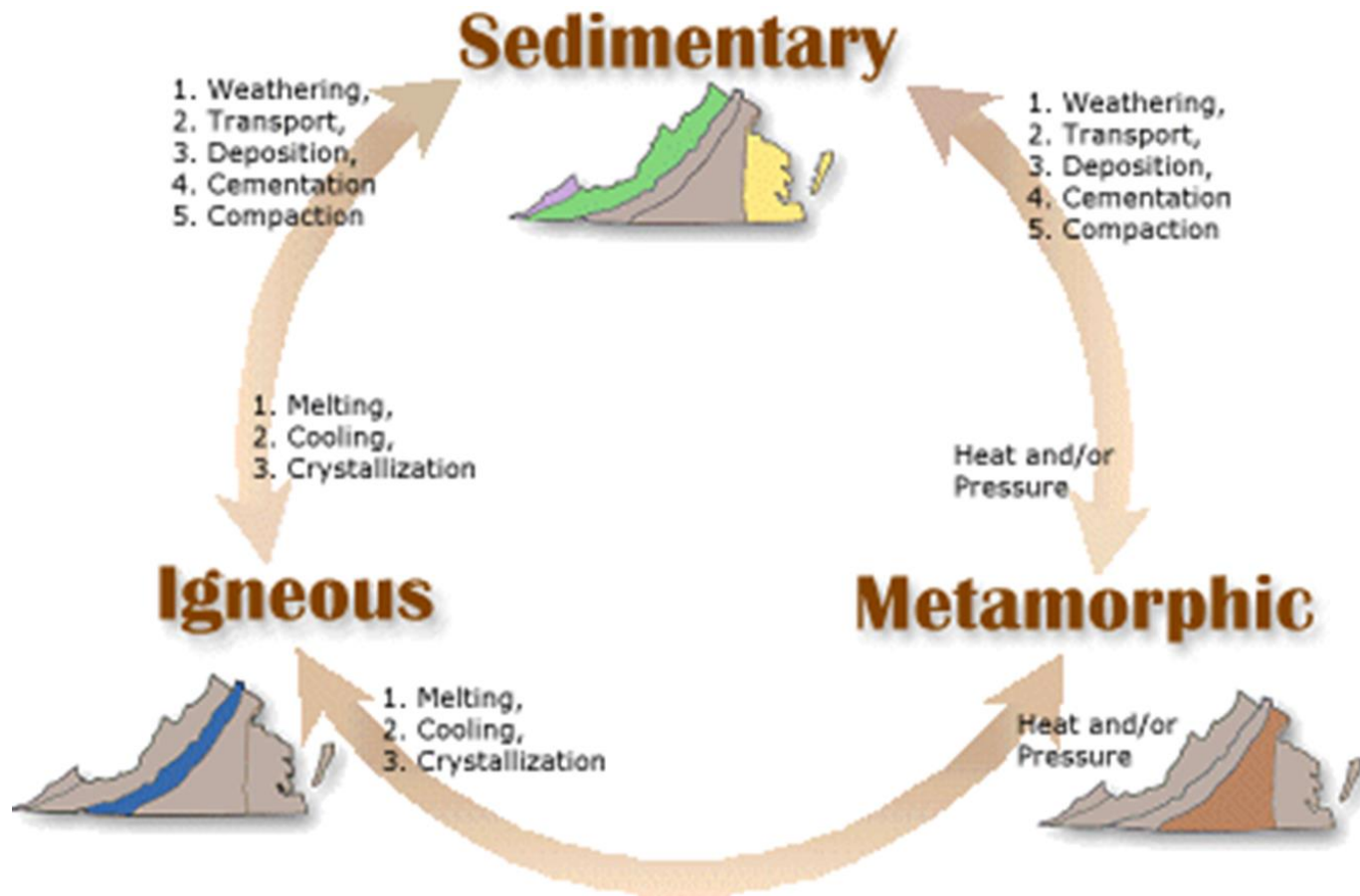
- Rocks constantly change over time and become another type of rock
- The rocks on the Earth today are the same as they have ever been, but have changed over geologic time
- Rocks change due to weathering, transport, deposition, cementation, compaction, melting, cooling, crystallization, heat or pressure



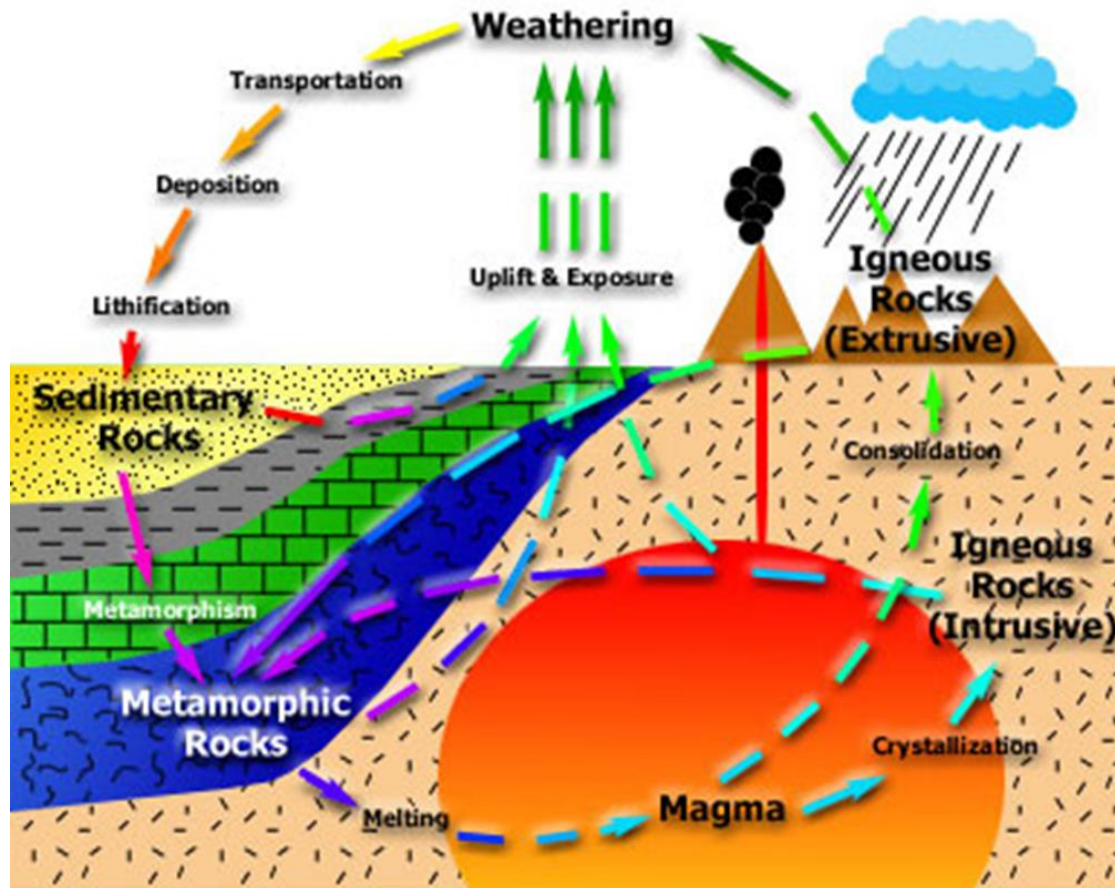
# The Reasons Rocks Change

- Weathering/erosion – loosening and moving of sediment by water, ice, wind and gravity
- Transport – moving of materials
- Deposition – settling of materials
- Cementation – small particles settling between sediments binding them together
- Compaction – packing together
- Crystallization – liquid or gas forming a solid state
- Melting – solid to liquid
- Cooling – decrease in temperature
- Heat – increase in temperature
- Pressure – force exerted upon something

# Rock Cycle



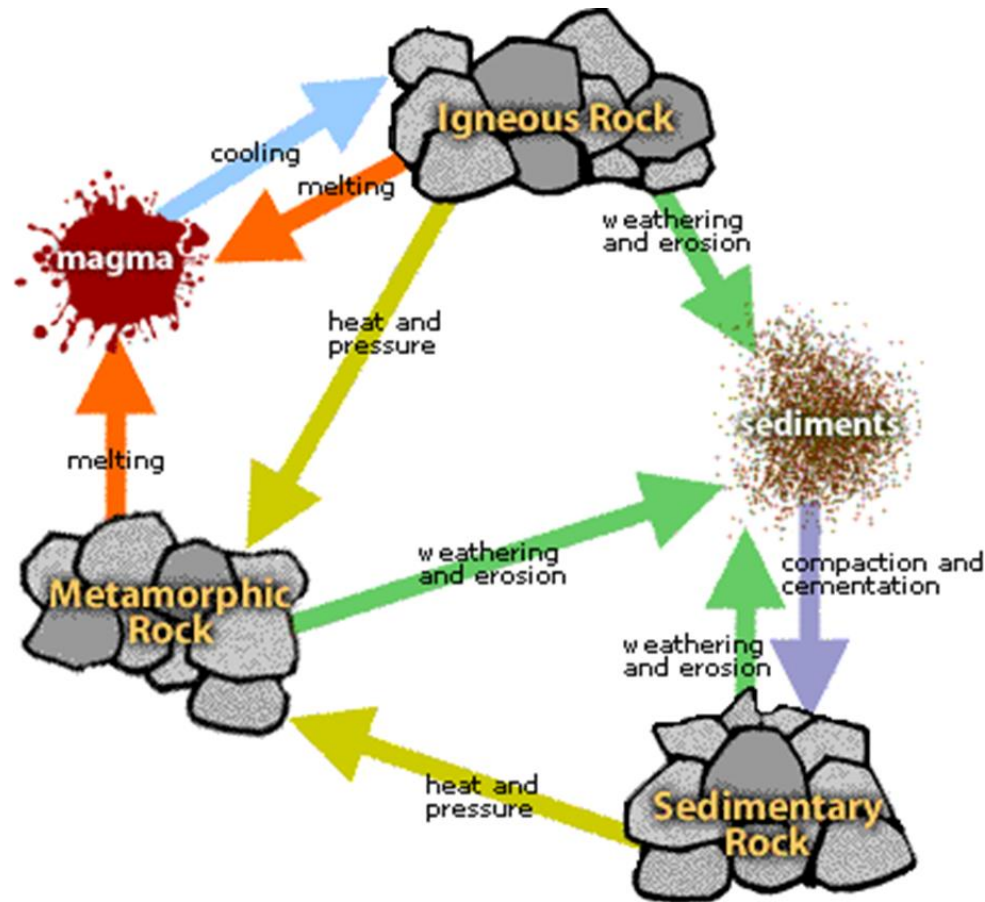
# Rock Cycle



# Examples of Rock Changes

- Sedimentary rocks get pushed deeper into the Earth over time and melt into magma where they eventually become igneous rocks
- Weathering of a metamorphic rock releases tiny particles that eventually join with other sediments and become sedimentary rocks
- Igneous basaltic oceanic crust subduct at a plate boundary and due to pressure and heat become metamorphic rocks

# Rock Cycle Examples



# Rock Layers

- Sediment of many kinds (gravel, sand, mud,...) will settle out and form a layer
- This layer becomes sedimentary rock and will include dead plants and animals of that time
- Over long periods of time, sediment continues to settle and many layers form → Rock layers

# Law of Superposition

- The oldest rock layer is the deepest layer
- As layers are formed, the top layer is the most recent



← Most recent layer






















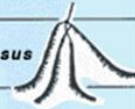


← Oldest layer

# Index Fossils and Rock Layers

- Fossils are the remains of living things from the past
- Index fossils are fossils that can be found within a “short” amount of geologic time in a wide spread area
- Index fossils are special fossils that help to identify the relative age of other organisms found within the same rock layer
- Relative age is the geologic age of a fossil in terms of what age range it can be found within
  - > **Index fossil example: Trilobites lived 542-488.3 million years ago (MYA) during the Cambrian Period**



# Index Fossils

CENOZOIC ERA (Age of Recent Life)	Quaternary Period	<i>Pecten gibbus</i>		<i>Neptunea tabulata</i>	
	Tertiary Period	<i>Calyptrophorus velatus</i>		<i>Venericardia planicosta</i>	
MESOZOIC ERA (Age of Medieval Life)	Cretaceous Period	<i>Scaphites hippocrepis</i>		<i>Inoceramus labiatus</i>	
	Jurassic Period	<i>Perisphinctes tiziani</i>		<i>Nerinea trinodosa</i>	
	Triassic Period	<i>Trochites subbullatus</i>		<i>Monotis subcircularis</i>	
PALEOZOIC ERA (Age of Ancient Life)	Permian Period	<i>Leptodus americanus</i>		<i>Parafusulina bosei</i>	
	Pennsylvanian Period	<i>Dictyoclostus americanus</i>		<i>Lophophyllidium proliferum</i>	
	Mississippian Period	<i>Cactocrinus multibrachiatus</i>		<i>Prolecanites gurleyi</i>	
	Devonian Period	<i>Mucrospirifer mucronatus</i>		<i>Palmatolepus unicornis</i>	
	Silurian Period	<i>Cystiphyllum niagarensis</i>		<i>Hexamoceras hertzeri</i>	
	Ordovician Period	<i>Bathyrus extans</i>		<i>Tetragraptus fructicosus</i>	
	Cambrian Period	<i>Paradoxides pinus</i>		<i>Billingella corrugata</i>	
PRECAMBRIAN					