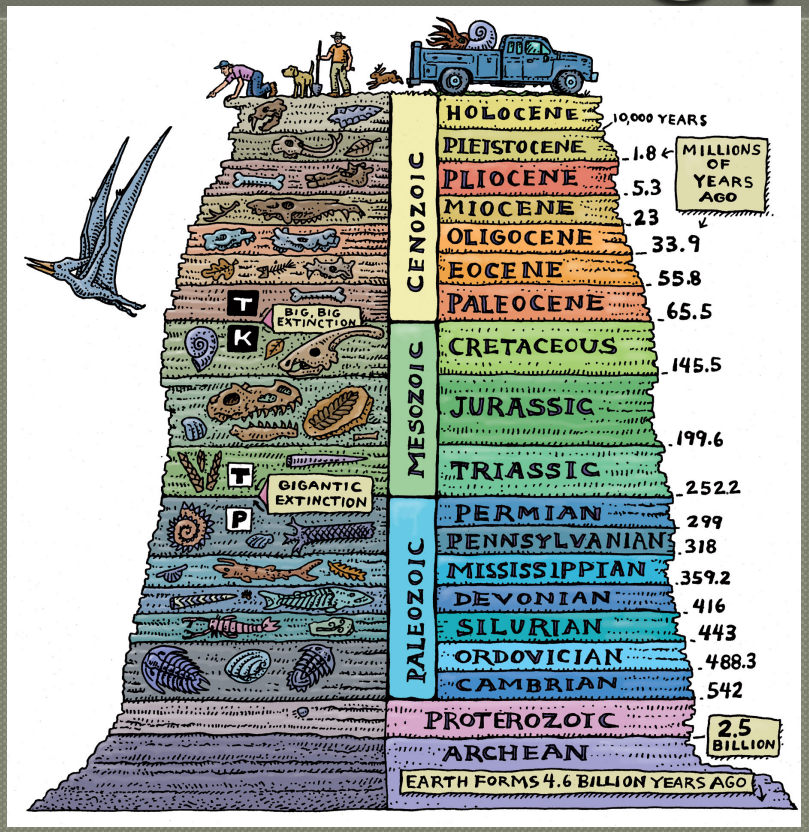
Geology Vocabulary



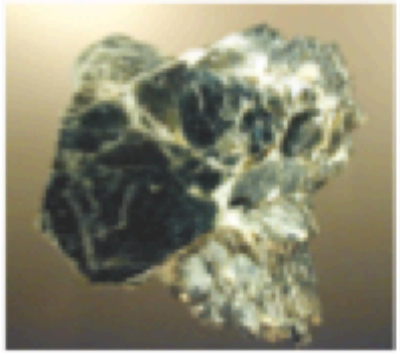
- Write ONLY the underlined parts on the <u>sage-colored slides</u>.
- Draw pictures for examples

Main Concept: Rocks are made from Minerals

- Rocks are nothing more than a mixture of different mineral crystals.

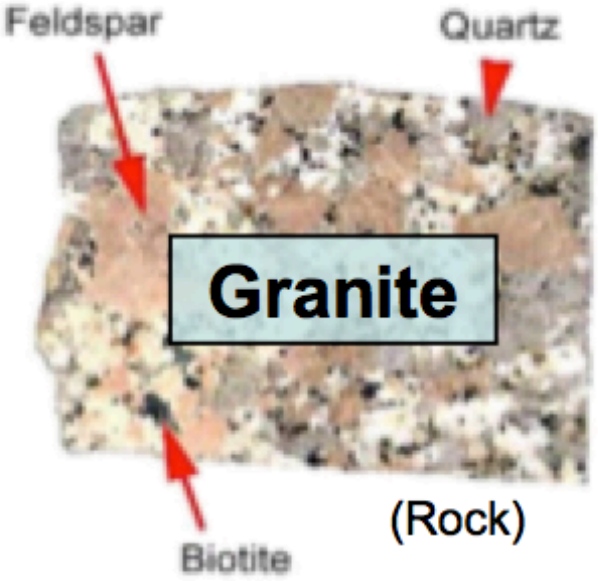
***All three minerals are combined in a Granite rock

Quartz (mineral) +



Biotite (mineral) +

Feldspar (mineral) =



(Rock)

This is Continental Crust!!!

Rocks are made from Minerals

- Rocks are nothing more than a mixture of different mineral crystals.

***Both minerals combined make Basalt

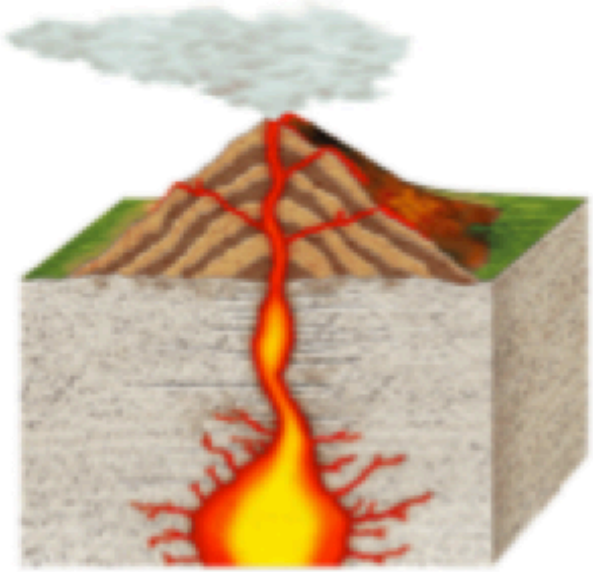
Pyroxene (mineral) + **Olivine** (mineral) = **Basalt** (rock)

This is Oceanic Crust!!!

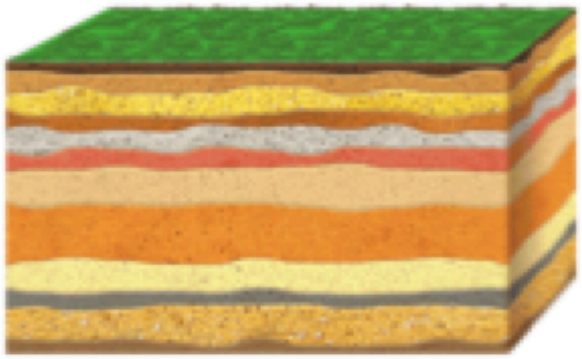
Rock Classification

Geologists classify rocks into three major groups depending on how they are formed:

Igneous rock, Sedimentary rock, and Metamorphic rock.



Igneous Rock forms when magma or lava cools and hardens.

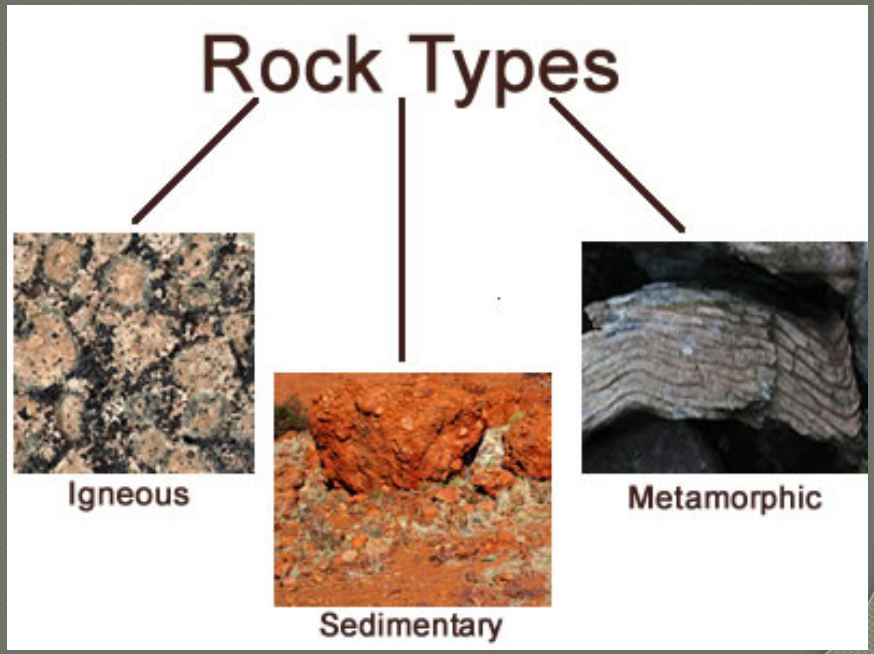


Sedimentary Rock forms when pieces of rock are pressed and cemented together.

Metamorphic Rock forms from other rocks that are changed by heat and pressure.

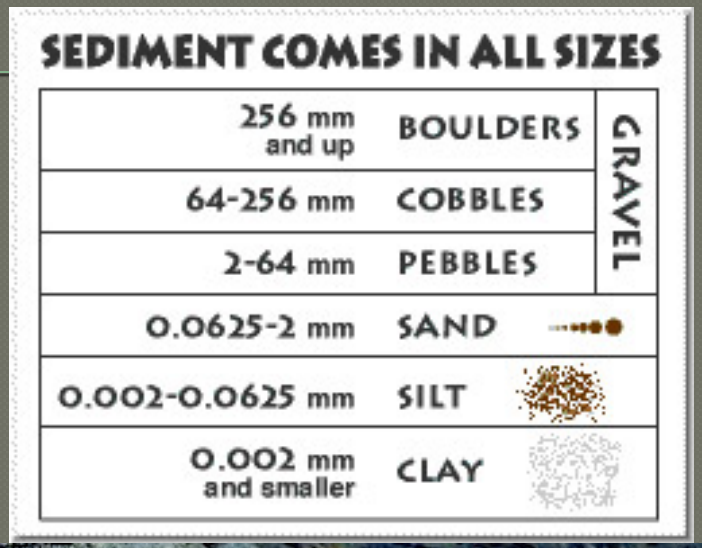
1. Geology

- The study of rocks, layers of soil, etc., in order to learn about the history of the Earth and its life



2. Sedimentary Rock

- A rock that forms from compressed or cemented layers of sediment.



Sedimentary Rocks

- Made up of smaller rocks cemented together
- Sometimes have fossils
- Usually have layers.

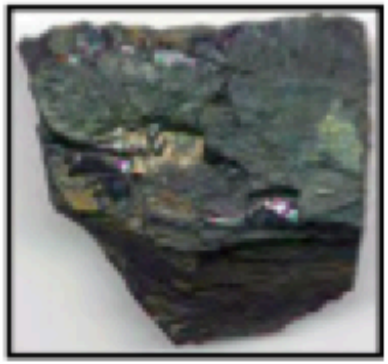
There are three types of rock: Sedimentary Rock

- Formed by **sediments** (pieces of rock, shells, and dead organisms) becoming "**cemented**" (stuck) together.

Sandstone

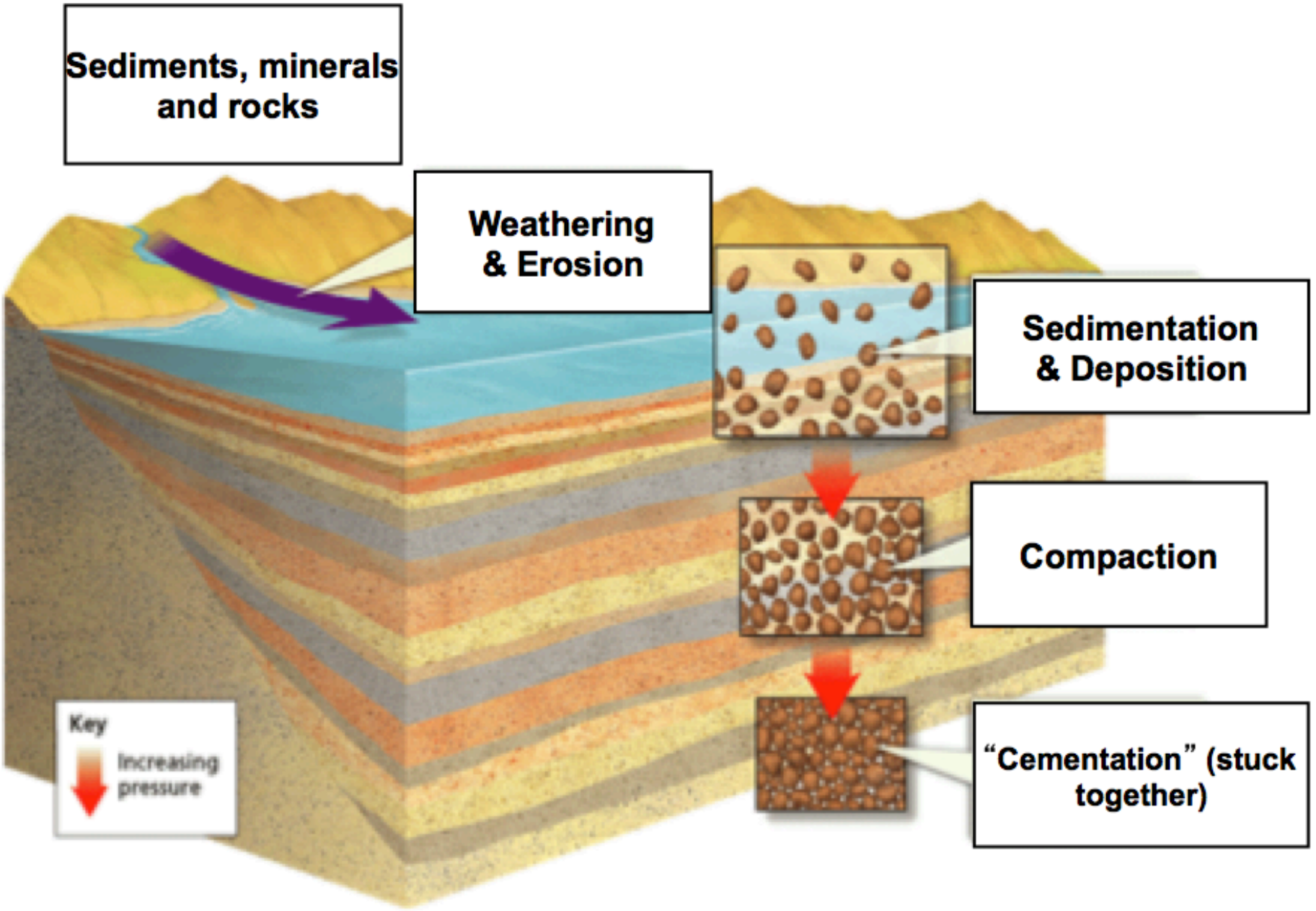
Limestone

Coal



Conglomerate

***You can see lots of different stuff stuck together in these rocks!


Sediments, minerals and rocks
Weathering & Erosion
Sedimentation & Deposition
Compaction
"Cementation" (stuck together)
Key
Increasing pressure

Sedimentary Rock

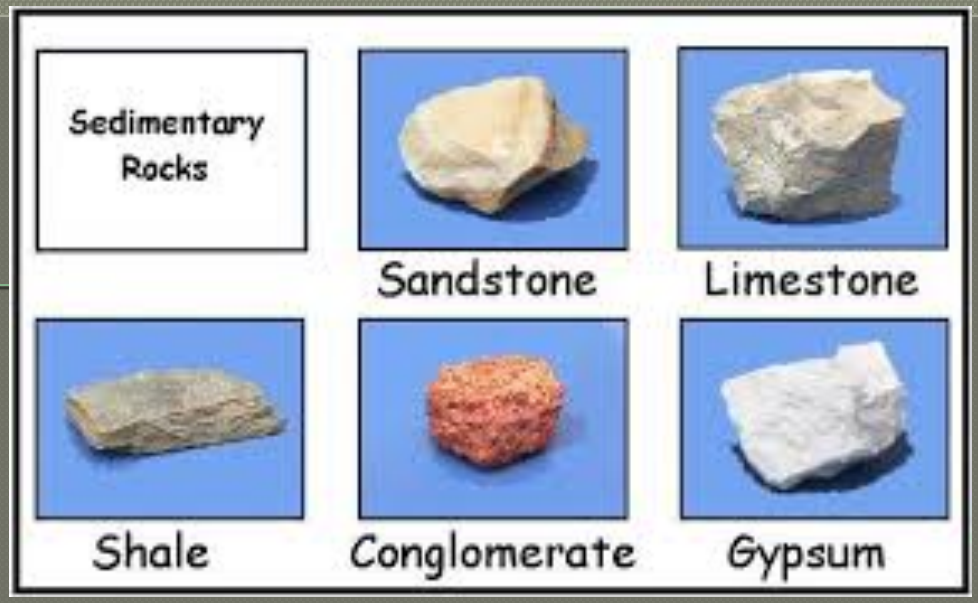
rock that is glued to other rock

Conglomerate Rock
Notice the rounded rocks

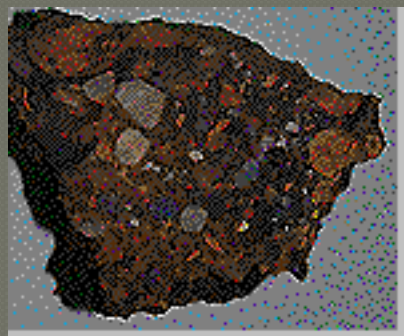
Breccia
Notice the jaded rocks glued

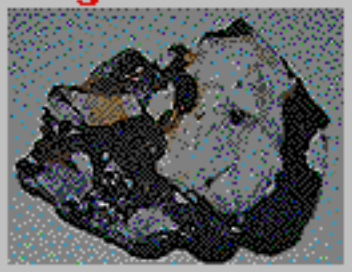
Take notice of small

Sandstone	Conglomerate	Breccia	Coal
			
Is a soft rock that has little gars between all of the particles that make it easy to absorb water. It is made up of sand that is tightly packed together.	This rock looks like it is made out of bigger chunks of stone. It has rounded edges.	Has large parts of rock fragments the has sharp edges.	Made of swamp plants the formed millions of years ago that slowly changed to form coal. Is smooth and a great fuel source.



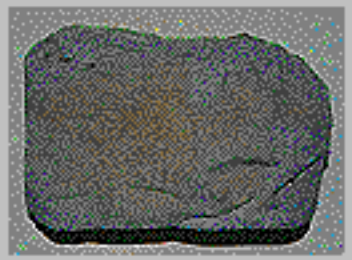
Clastic Rocks


Conglomerate


Breccia

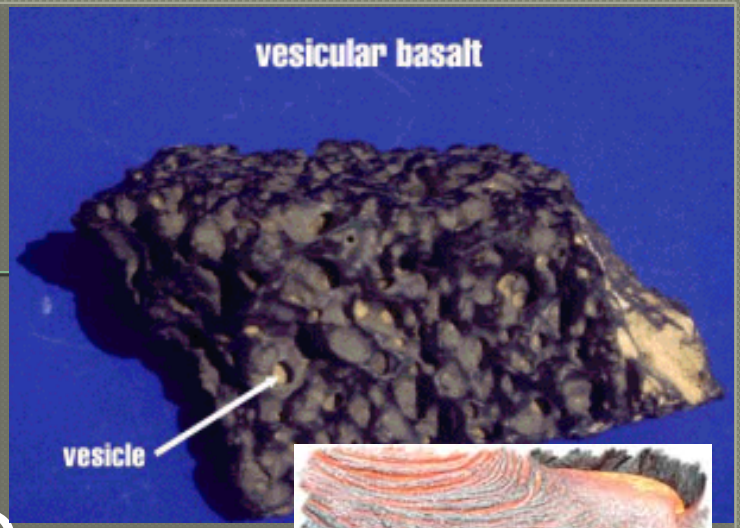

Red Sandstone

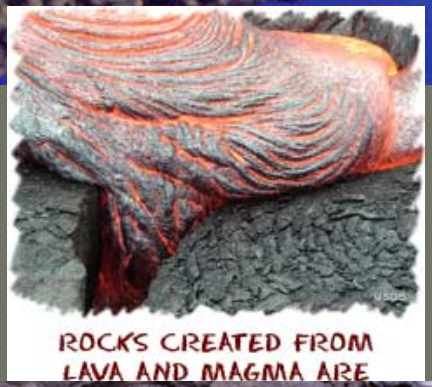

Shale


Gray Sandstone

3. Igneous Rock

- Rock formed by the volcanic activity; the solidification of magma or lava



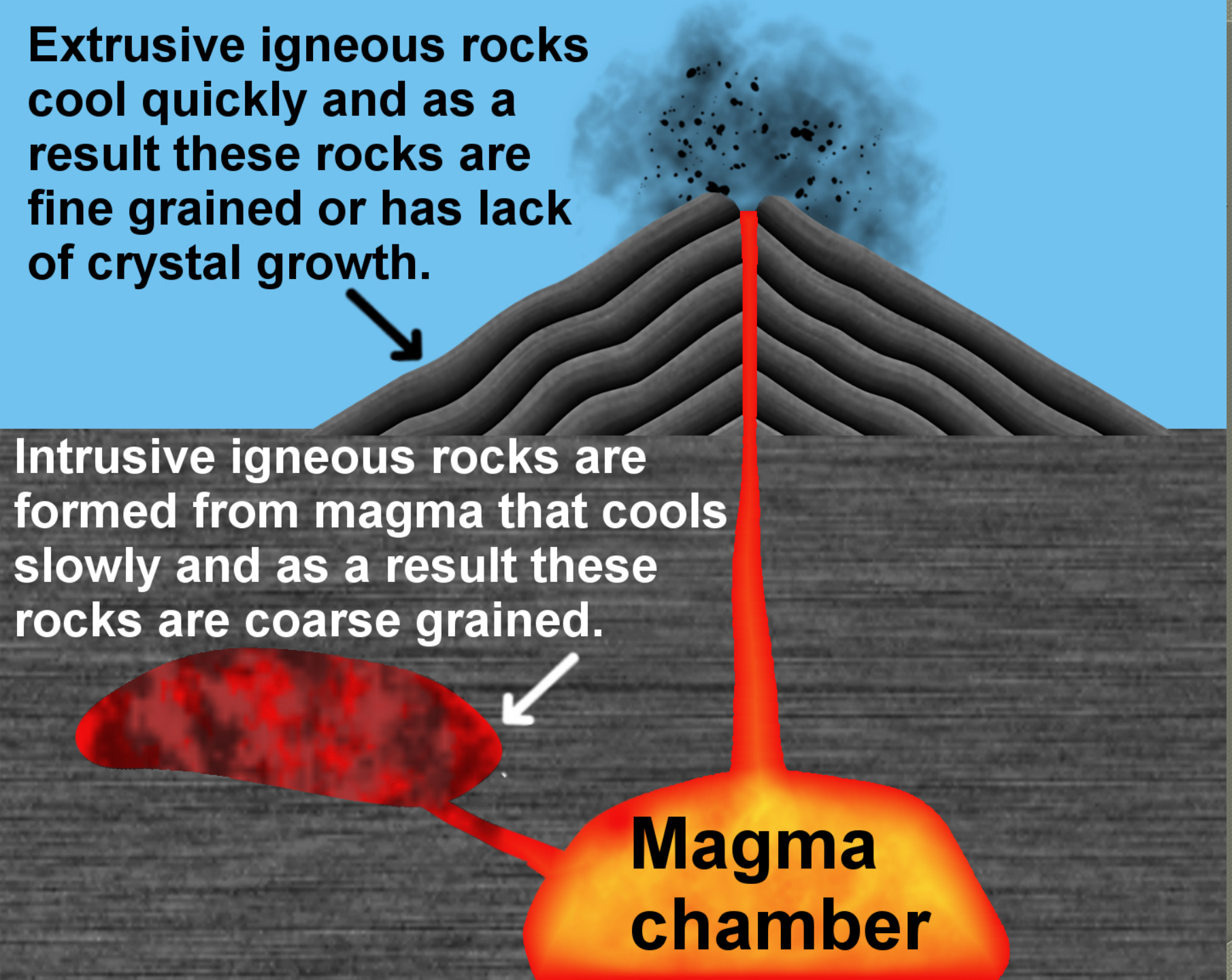


- **Formed from cooled Lava and Magma**

As an Example:

can become

***When the lava cools and turns into a solid, it can turn into Basalt!


Extrusive igneous rocks cool quickly and as a result these rocks are fine grained or has lack of crystal growth.
Intrusive igneous rocks are formed from magma that cools slowly and as a result these rocks are coarse grained.
Magma chamber

Examples of Igneous Rocks

Rocks formed as lava cooling on Earth's surface:

Basalt

Rhyolite

Obsidian

Rocks formed as magma cooling under the Earth's surface:

Diorite

Gabbro

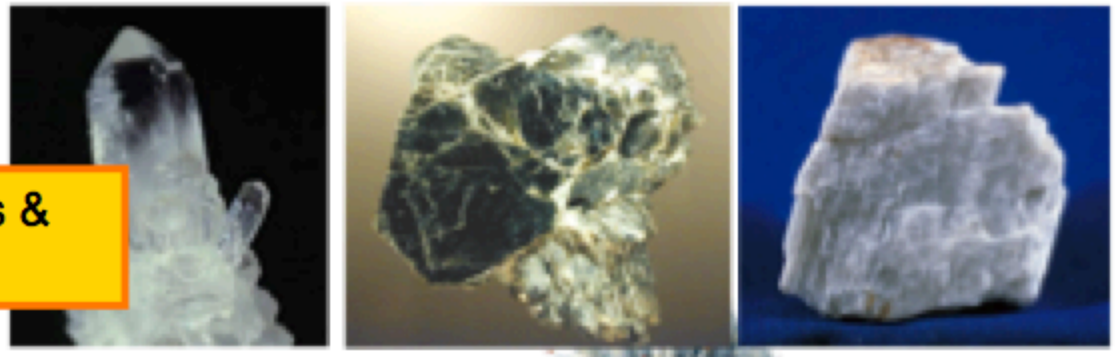
Granite

Click to go back to igneous rocks information

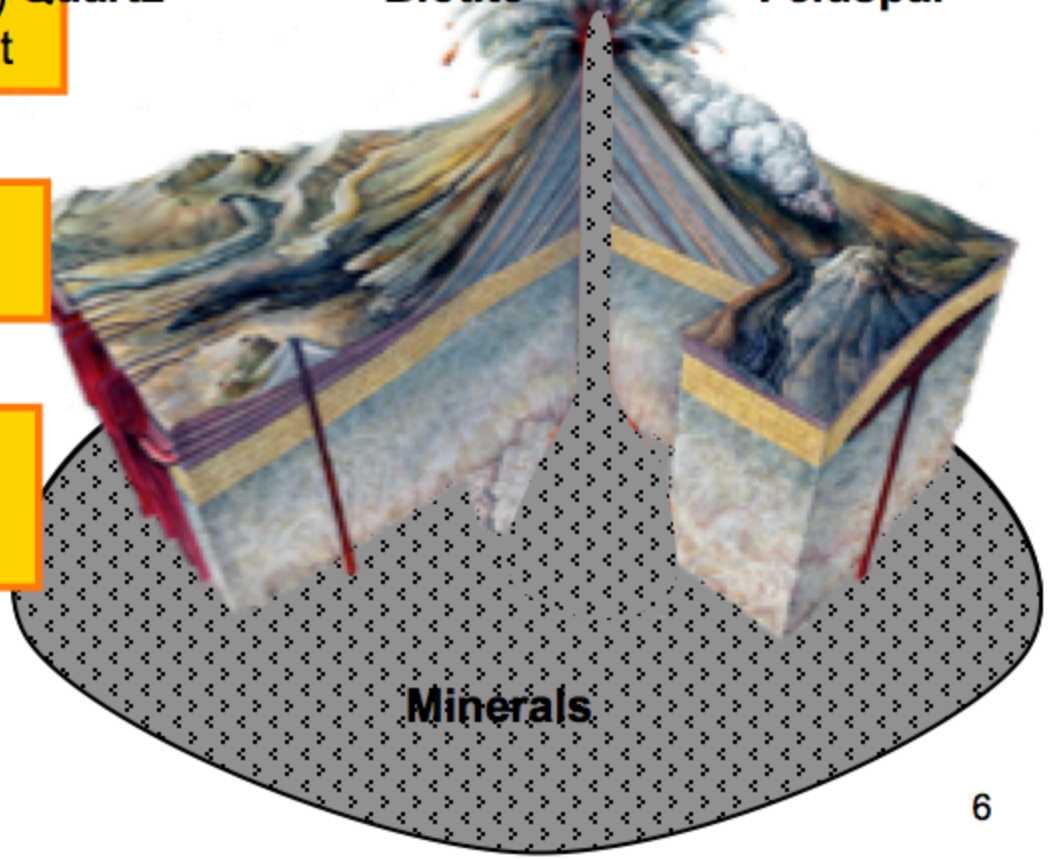
Quit

Igneous Rock

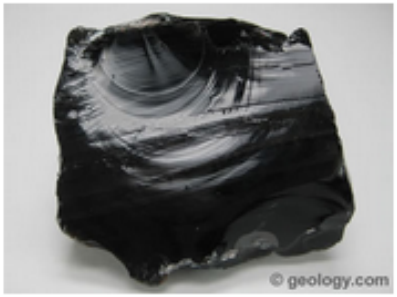
1. Take some Minerals & Gasses – Mix well
2. Place in oven (2,000 C) Add Heat Energy & Melt
3. Change Rock to Liquid Phase (Magma)
4. Remove from heat, let it Cool & Crystallize (Intrusive/ Extrusive)
5. **Igneous Rock Serve and Enjoy**



Quartz + Biotite + Feldspar




ANDESITE
BASALT
DIORITE
GABBRO
IGNEOUS ROCKS
GRANITE
OBSIDIAN
PEGMATITE
PERIDOTITE
PUMICE
RHYOLITE
SCORIA
TUFF

Granite	Gabbro	Basalt	Obsidian
Granite is a very hard rock which is mostly used for building stone. This rock has many different crystals and minerals such as feldspar, mica, and quartz. This rock is intrusive	Gabbro is a rock with minerals such feldspar and olivine. It is also coarse-grained. This rock is intrusive.	Basalt is a rock that is fine-grained and extrusive.	Obsidian is my favorite rock and it is very dark and glassy. It forms in volcanos and it is extrusive.
			

- Granite is commonly used for kitchen counter tops.
- Obsidian makes lovely jewelry.
- Pumice is used for personal care items

Types of Igneous Rocks and Their Uses

4. Metamorphic Rock

- a new highly compacted, crystalline rock formed by extreme heat and/or pressure. (has undergone changes from its original rock type)

Metamorphic Rocks

- To "**Morph**" means to change it!
  "…more than meets the eye!"
  - Rocks that have changed after being buried DEEP underground. The **heat** and **pressure** from being deep underground **changed the rocks.**
  - They were once Igneous or Sedimentary rocks, but not anymore.
  - Has large, inter-grown crystals in thin "bands" (Foliated) or clusters (Non-Foliated).

Pressure and Heat lead to Metamorphic Rocks

The shoes represent the pressure caused by all the rock above the crystals

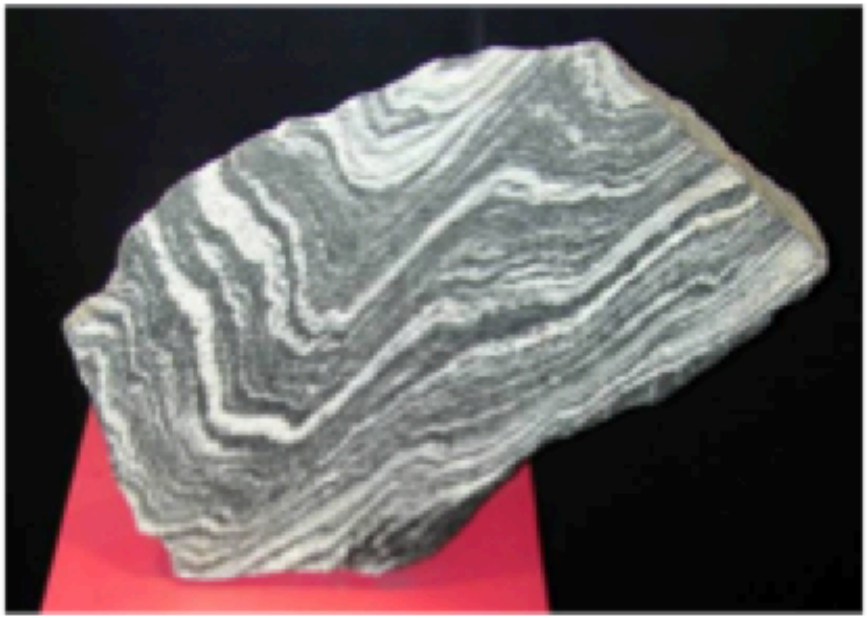
Crystals are large

The "playing cards" represent mineral crystals in a rock!

Crystals have become "squished"

Foliated v. Non Foliated

- Geologists classify metamorphic rocks according to the arrangement of the grains that make up the rocks.



Foliated
(curvy thin crystal lines - Gneiss)

Non Foliated
(No lines - Quartzite)

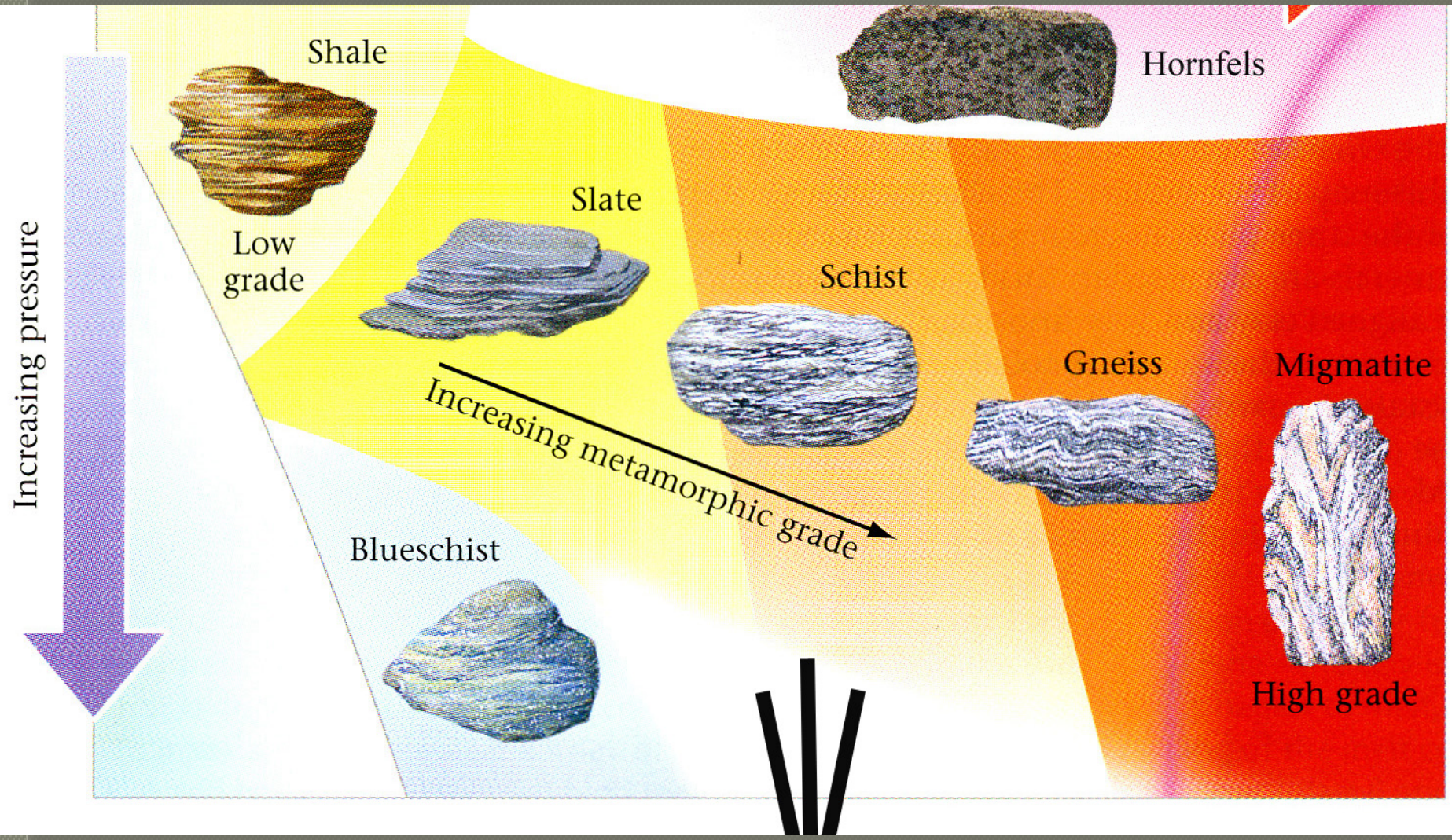
Examples of Metamorphic Rock:

- Gneiss:

- Schist:

- Slate:

Can you see all the straight layers of crystals?


Shale
Low grade
Slate
Schist
Hornfels
Gneiss
Migmatite
High grade
Blueschist
Increasing metamorphic grade
Increasing pressure

Gneiss rock

Marble rock

Slate rock

Quartzite rock

Schist rock

Fig 1: Metamorphic rock

UNIFORMITARIANISM

Uniformitarianism

the theory that Earth's features are mostly accounted for by gradual, small-scale processes that occurred over long periods of time

Study.com

5. Uniformitarianism

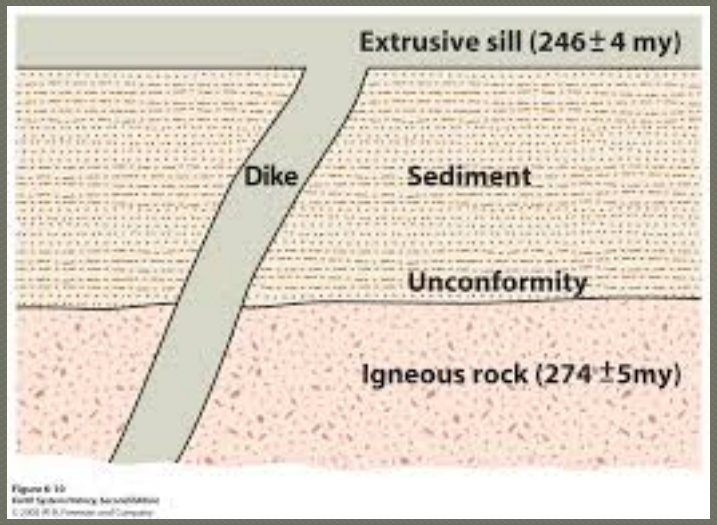
- A principle that geologic processes that occurred in the past can be explained by current geological processes.

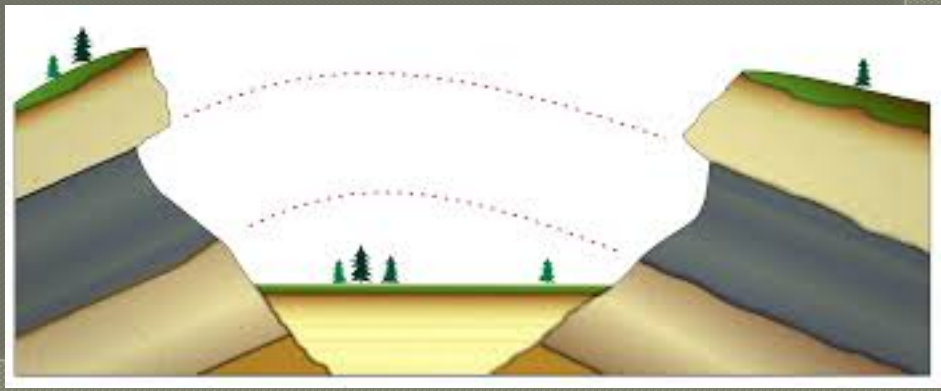
6. Superposition

- A principle that states that younger rocks lie above older rocks if the layers have not been disturbed.

7. Unconformity

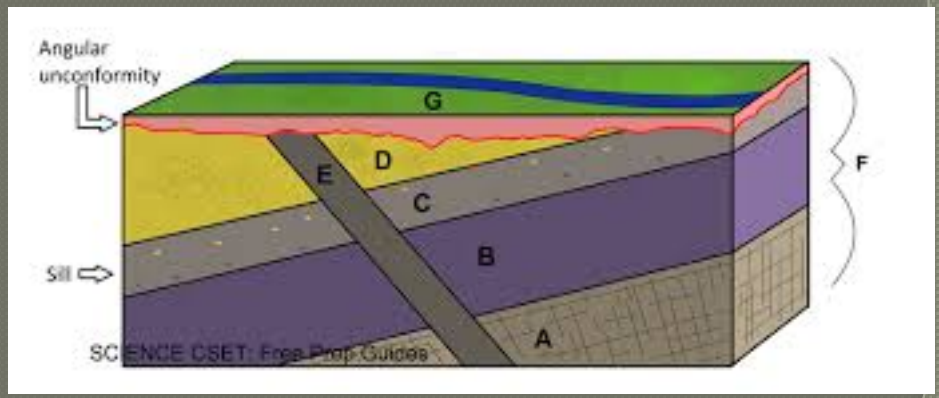
- A break in the geologic record created when rock layers are eroded or when sediment is not deposited for a long period of time. (*missing time)

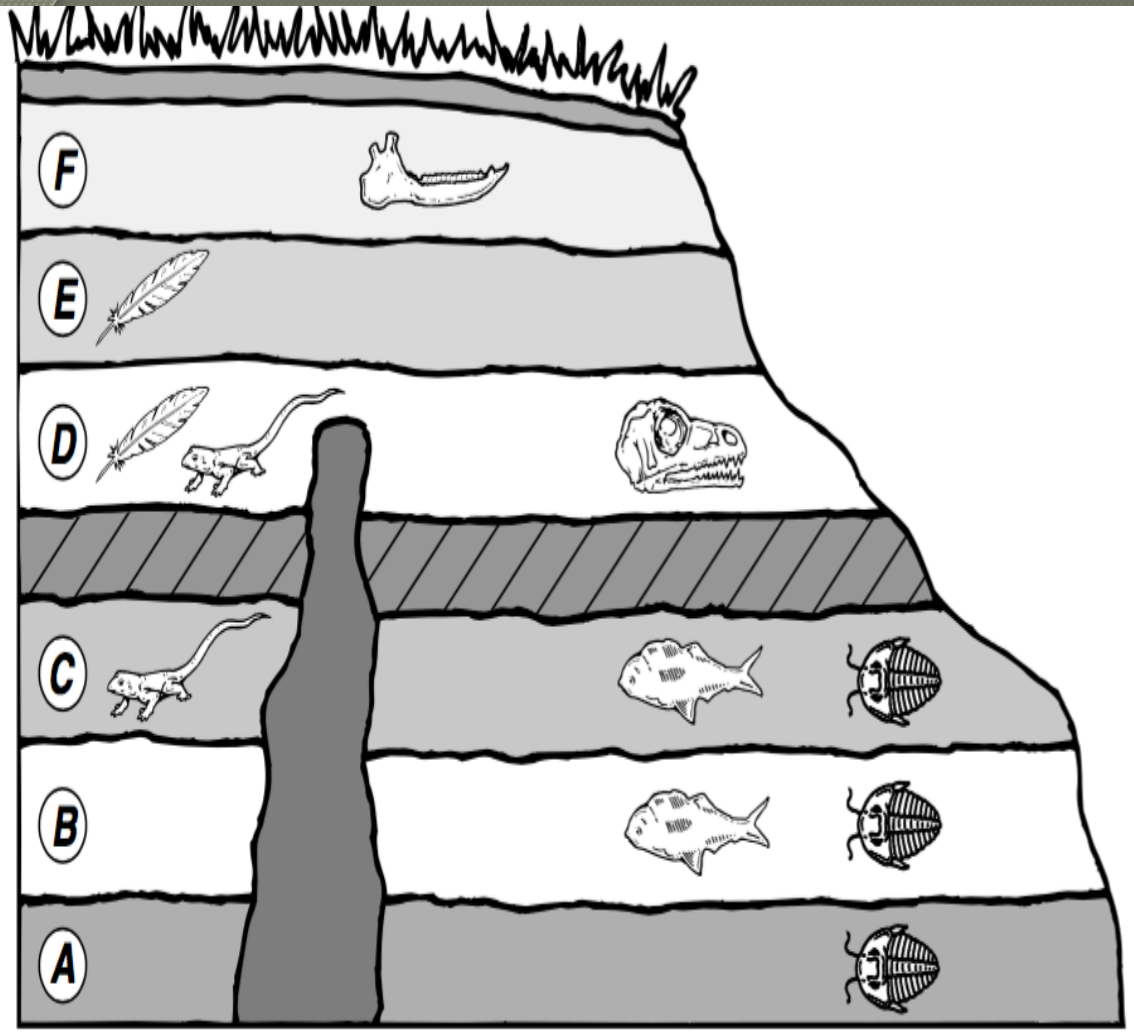


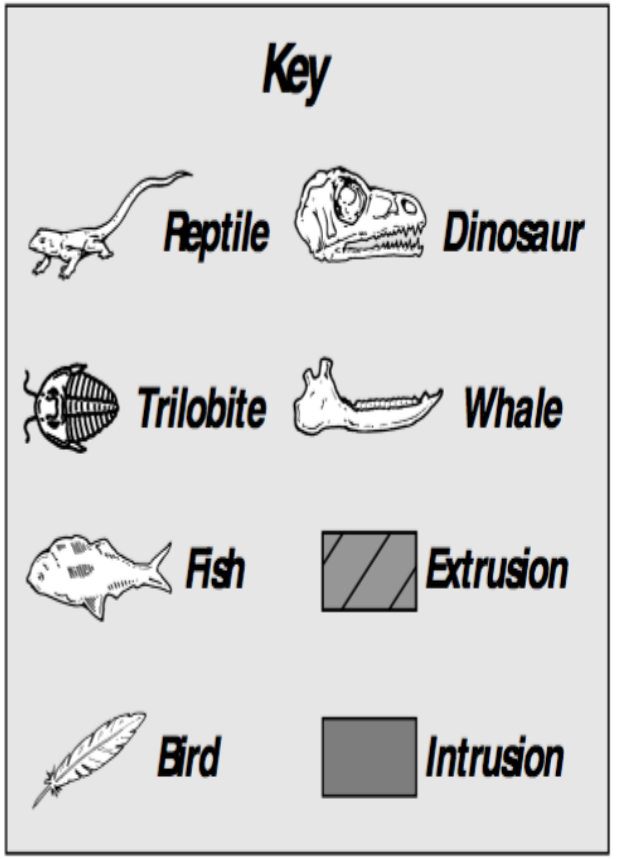


8. Intrusion

- Is molten rock from Earth's interior that squeezes into existing rock and cools.

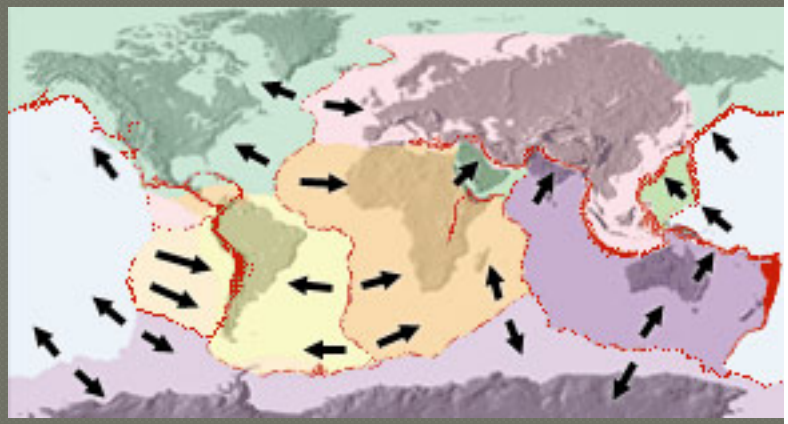


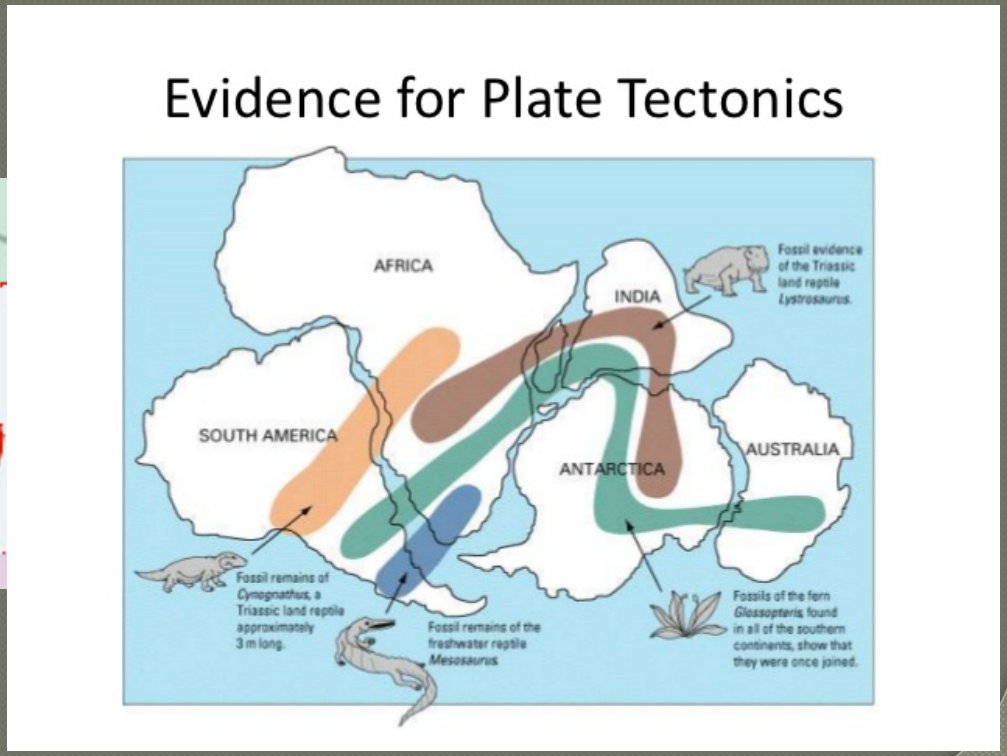

F
E
D
C
B
A


Key
Reptile
Dinosaur
Trilobite
Whale
Fish
Extrusion
Bird
Intrusion

10. Plate Tectonics

- The theory that explains how large pieces or Earth's crust move and change shape.



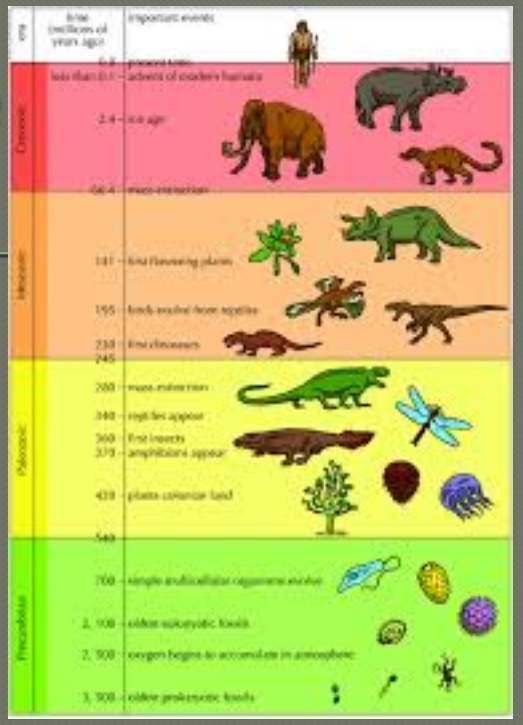


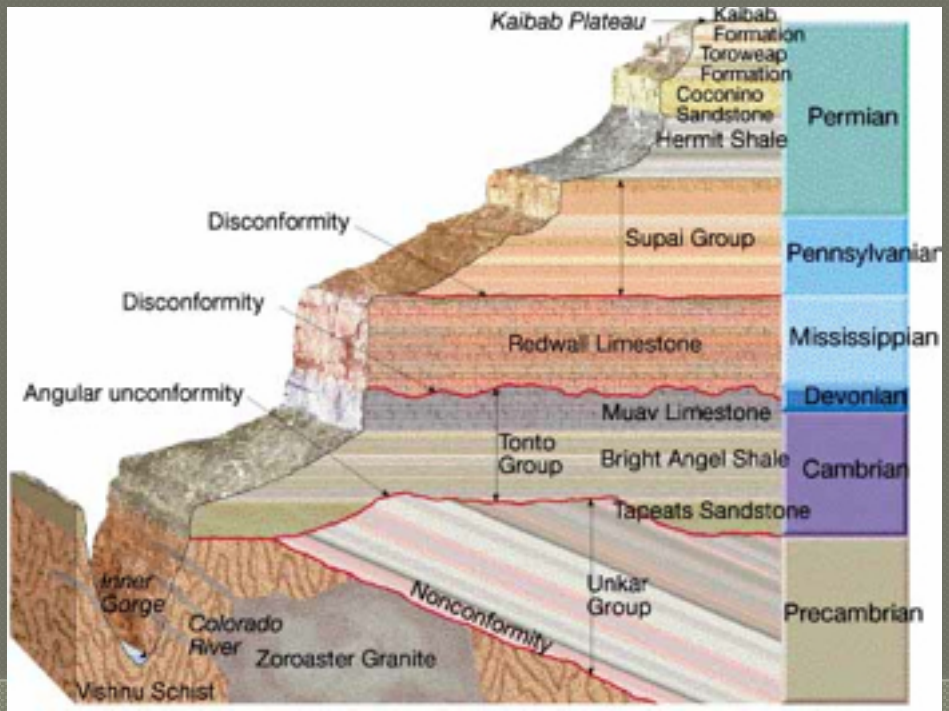
11. Continental Drift

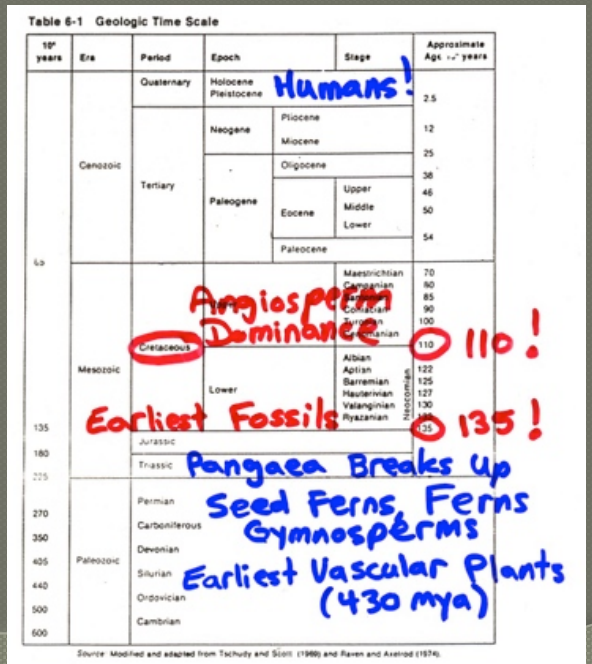
- The hypothesis that a single large landmass broke up into smaller landmasses to form the continents
- the movement of continents

12. Geologic Time Scale

- The standard method used to divide Earth's long natural history into manageable parts.

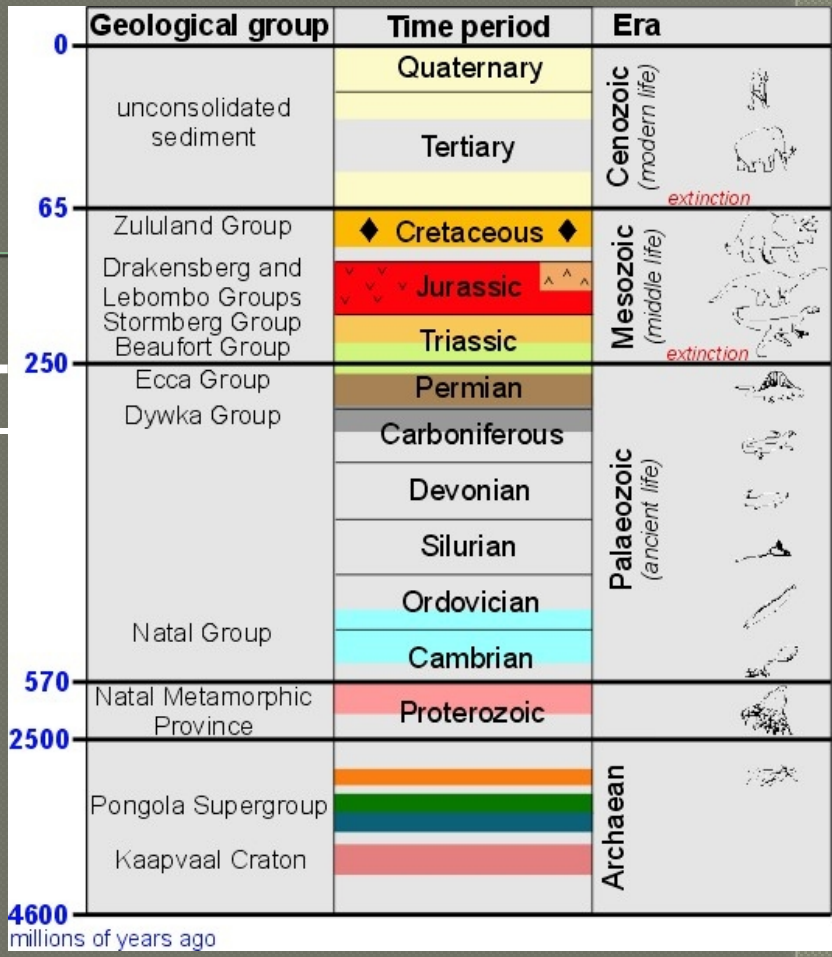




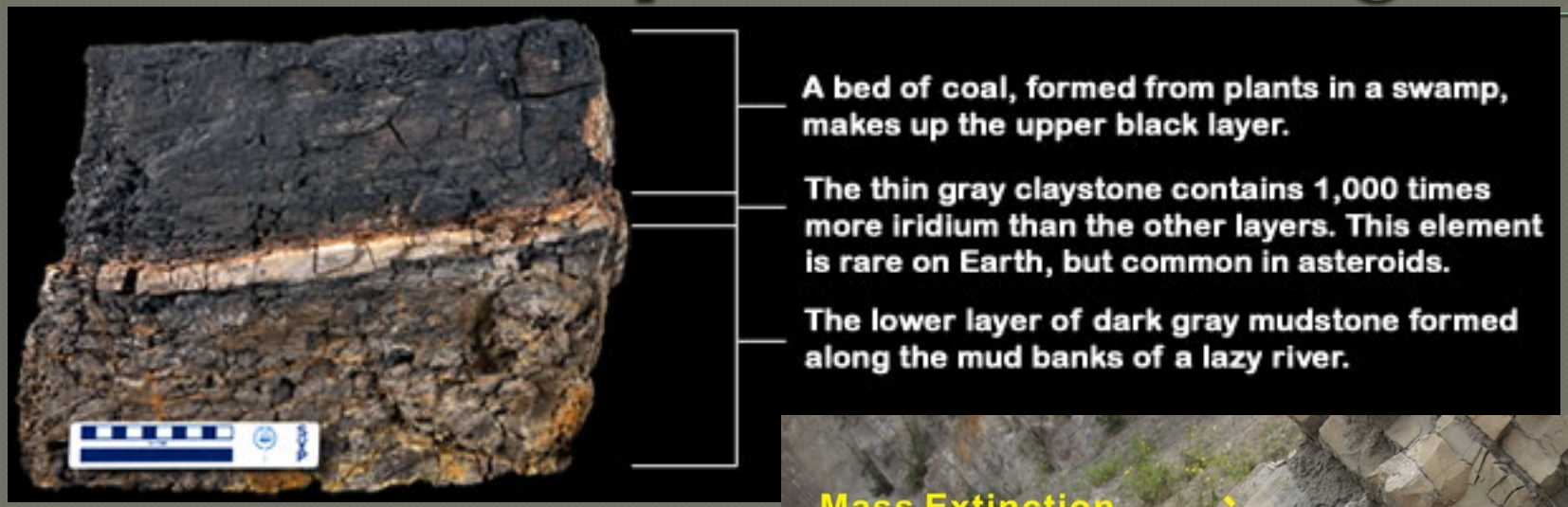


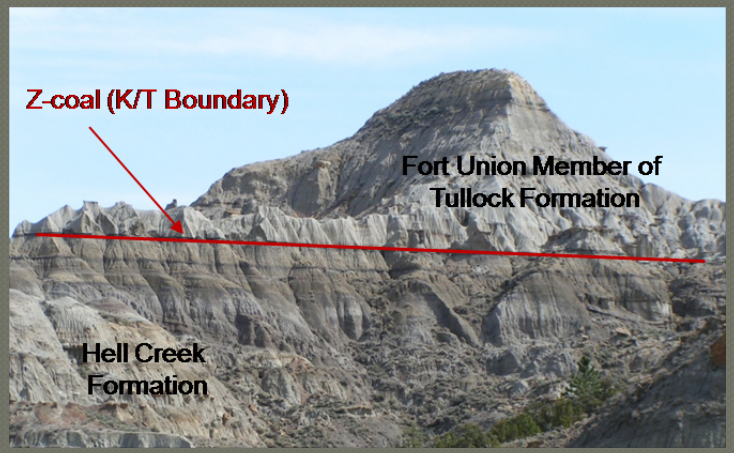
13. Extinction

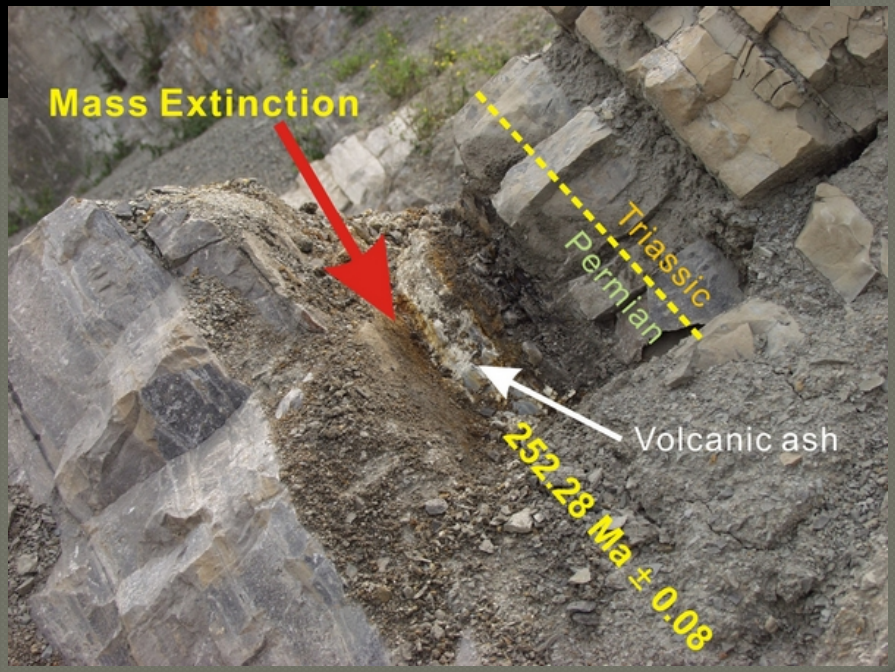
- The death of every member of a species.

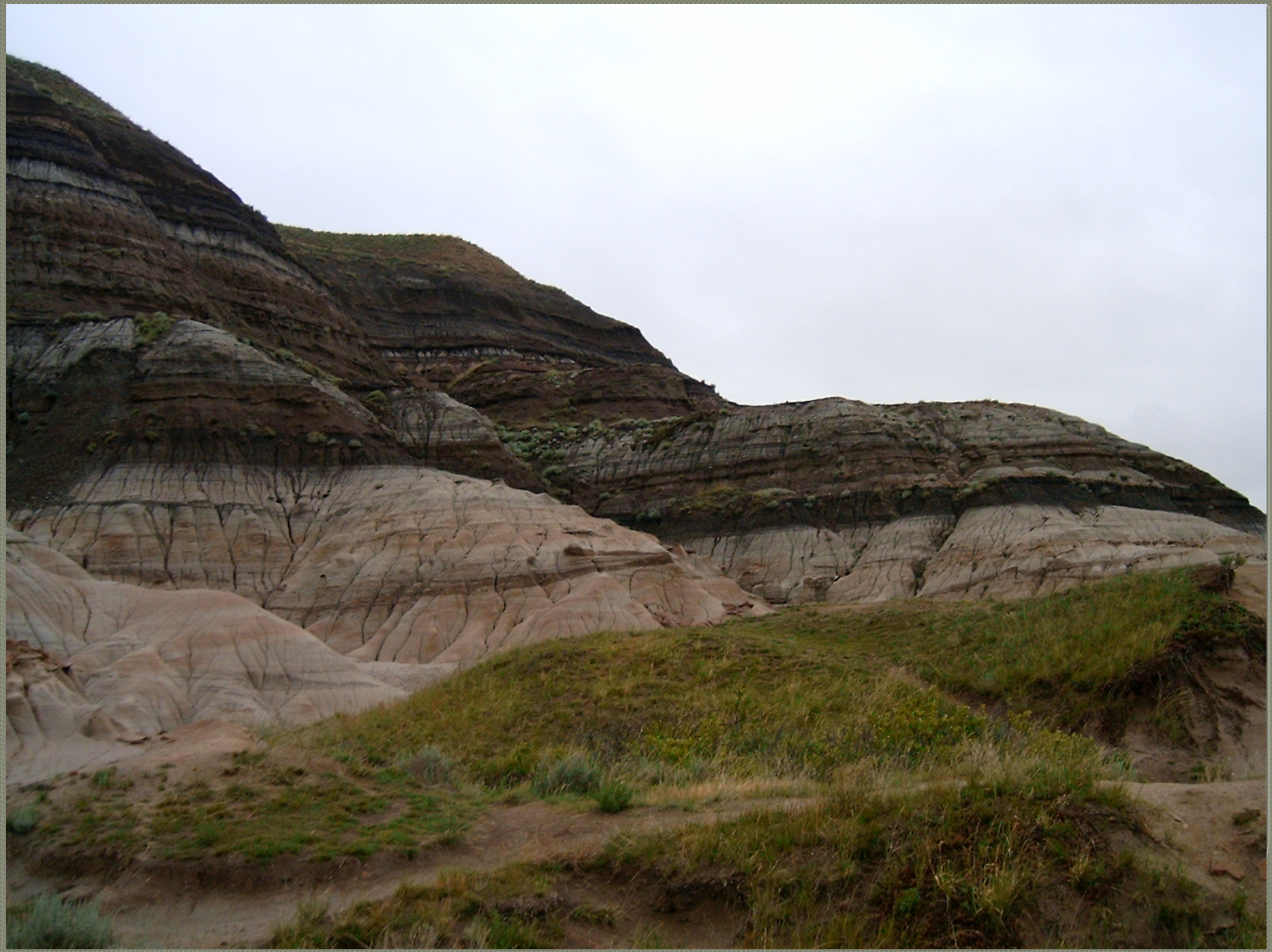


Iridium Layer around the globe





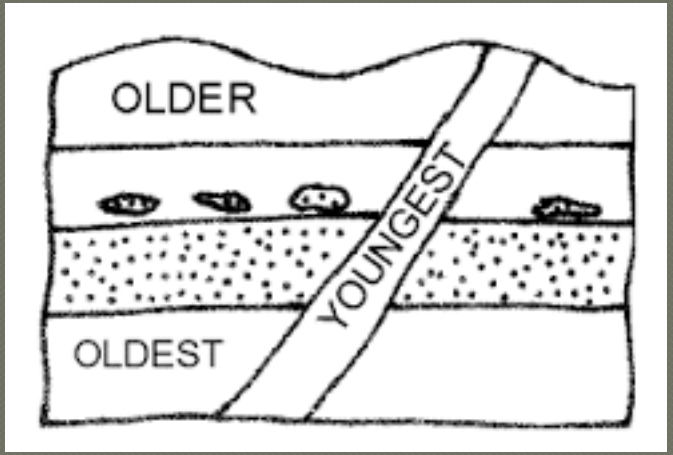


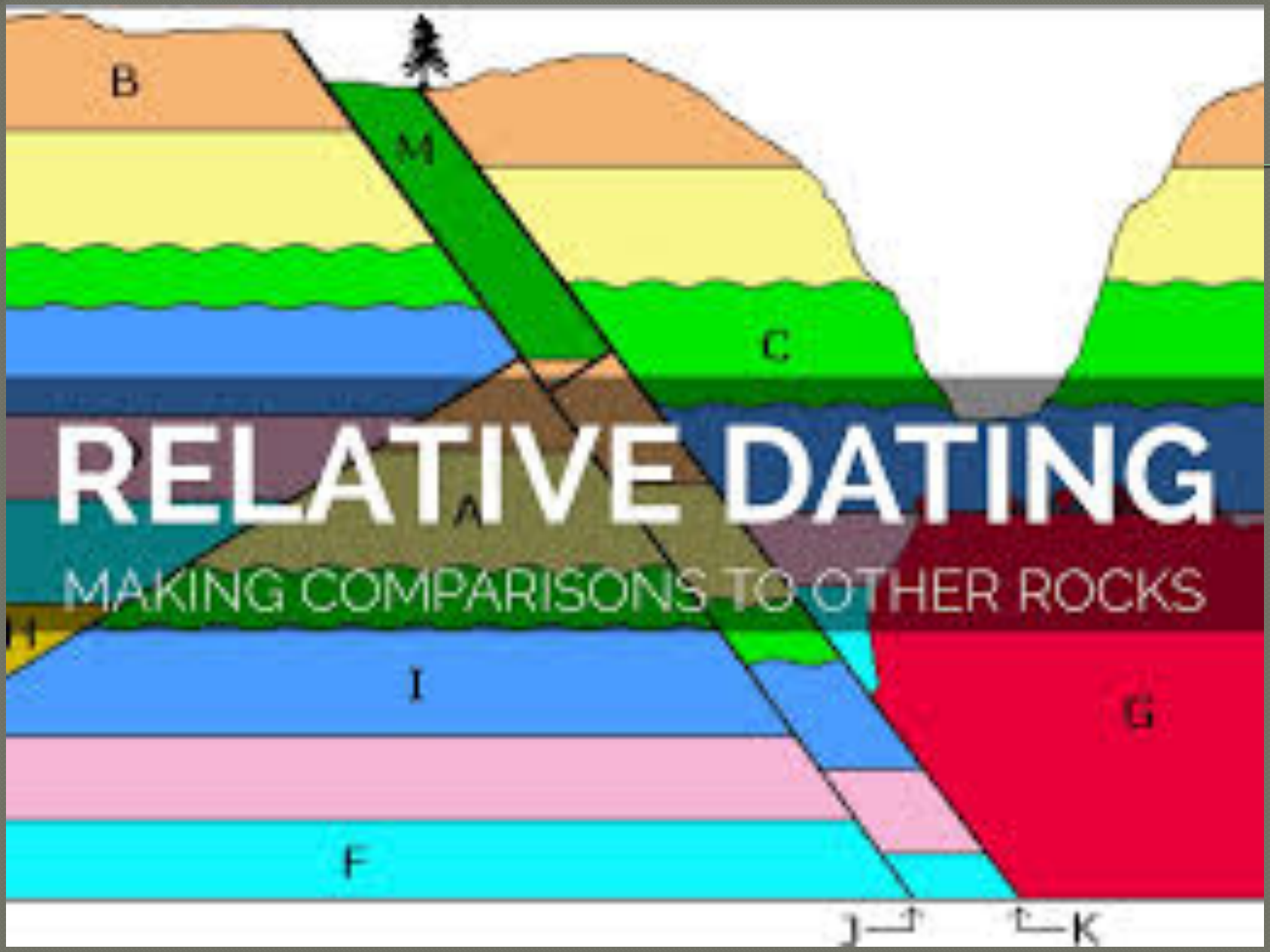


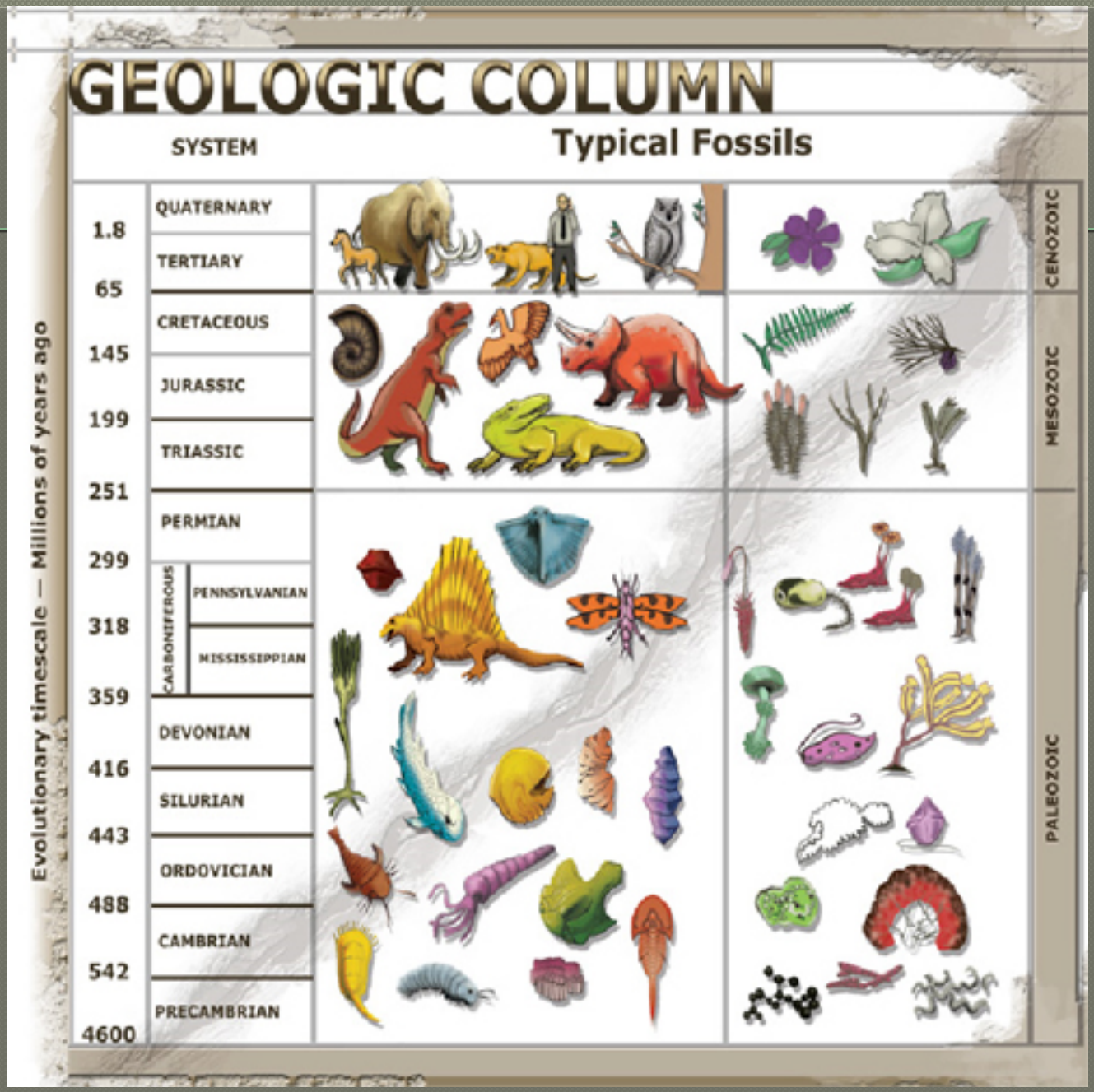
Iridium K/T Boundary

14. Relative Dating

- Any method of determining whether an event/ object is older or younger than other events/objects.




B
M
C
RELATIVE DATING
MAKING COMPARISONS TO OTHER ROCKS
I
G
F
J
K


GEOLOGIC COLUMN
SYSTEM
Typical Fossils
Evolutionary timescale — Millions of years ago
1.8
65
145
199
251
299
318
359
416
443
488
542
4600
QUATERNARY
TERTIARY
CRETACEOUS
JURASSIC
TRIASSIC
PERMIAN
CARBONIFEROUS
PENNSYLVANIAN
MISSISSIPPIAN
DEVONIAN
SILURIAN
ORDOVICIAN
CAMBRIAN
PRECAMBRIAN
CENOZOIC
MESOZOIC
PALEOZOIC

15. Fossils

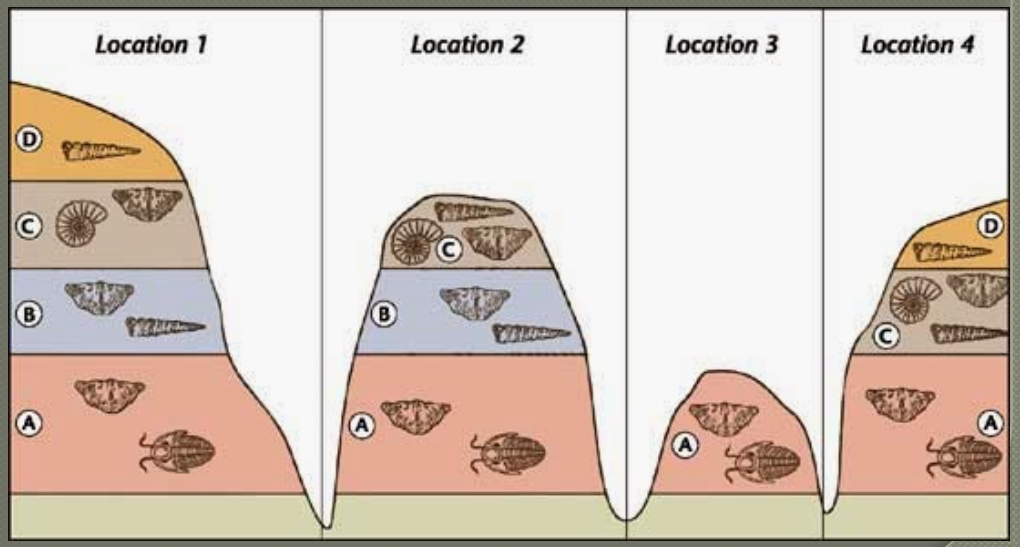
- The remains of an organism that lived long ago, most commonly preserved in sedimentary rock

15. Trace Fossils

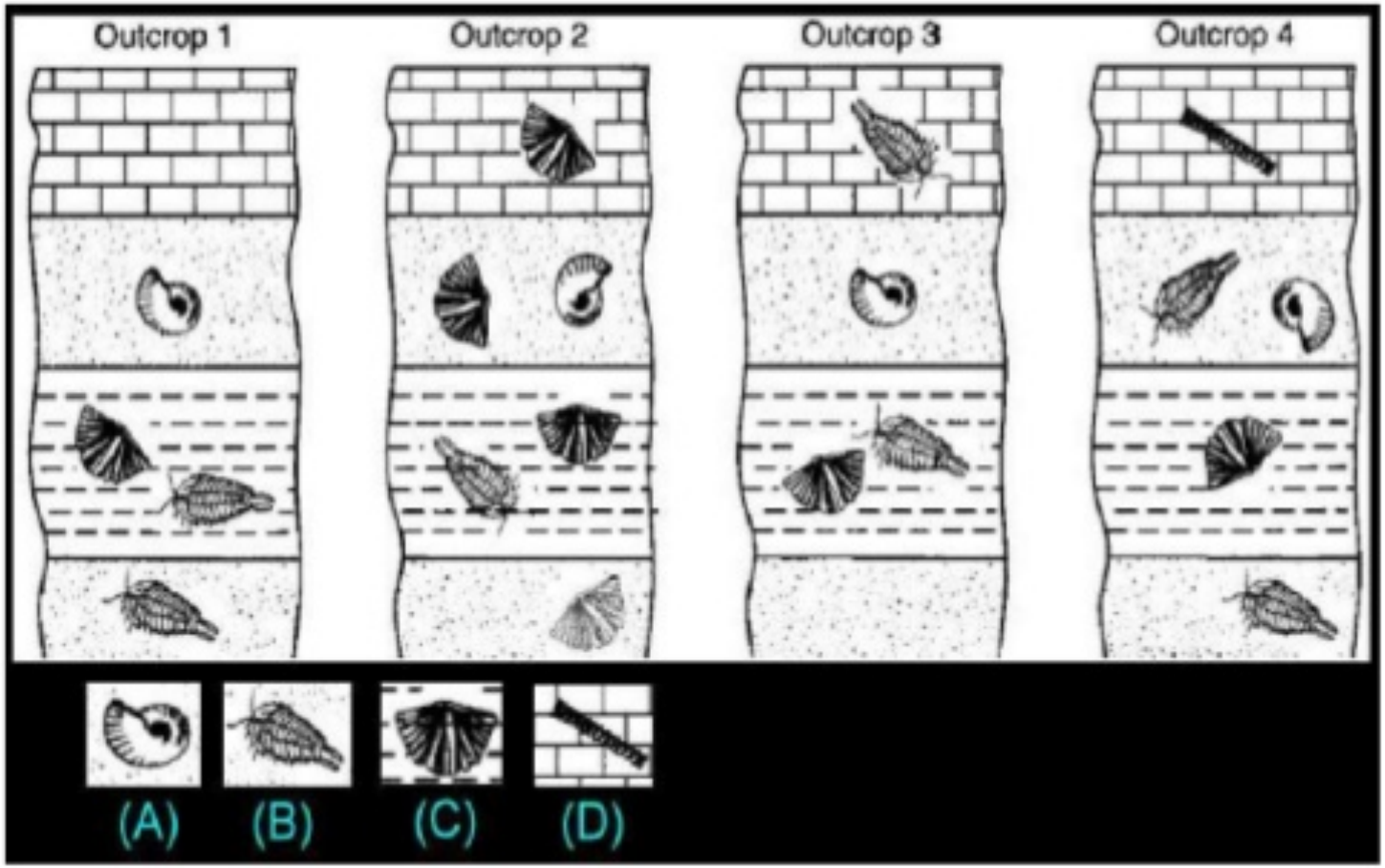
- A fossilized structure, such as a footprint, that formed in sedimentary rock by animal activity.

16. Index Fossil

- A fossil that is used to establish the age of a rock layer because the fossil is distinct, abundant, and widepread; and existed for only a short span of geologic time



Which organism would make the best index fossil?

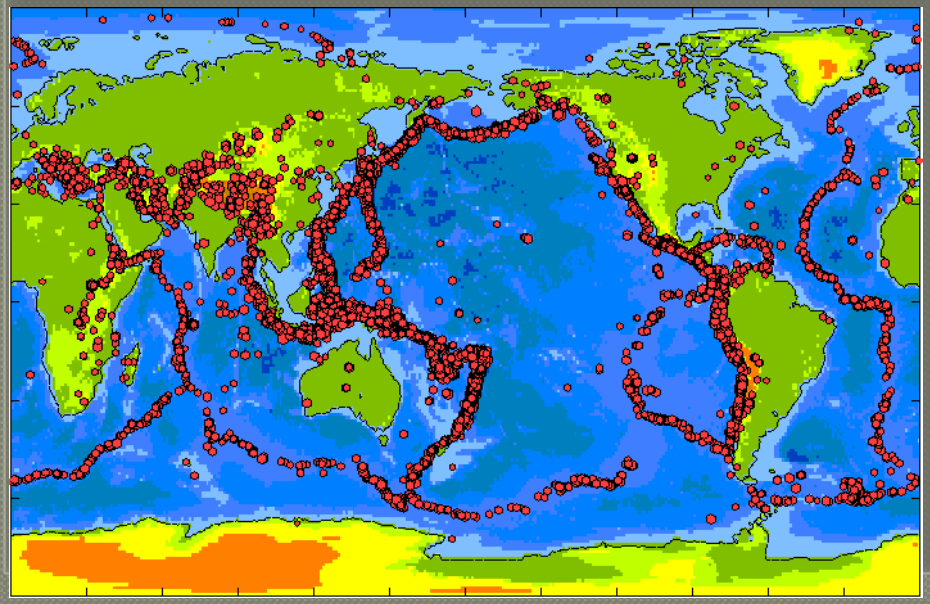


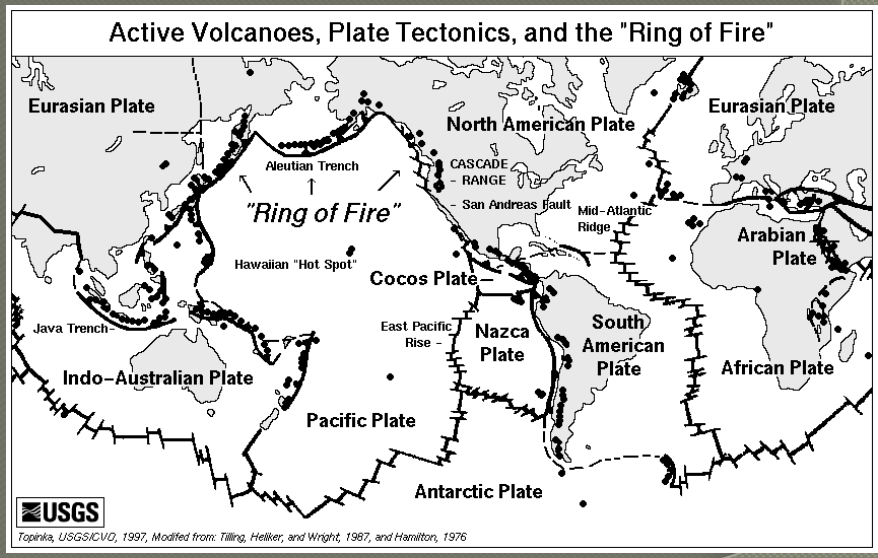
18. Pangea

- The name of the super continent – one giant landmass existed about 245 Mya (million years ago)

19. Ring of Fire

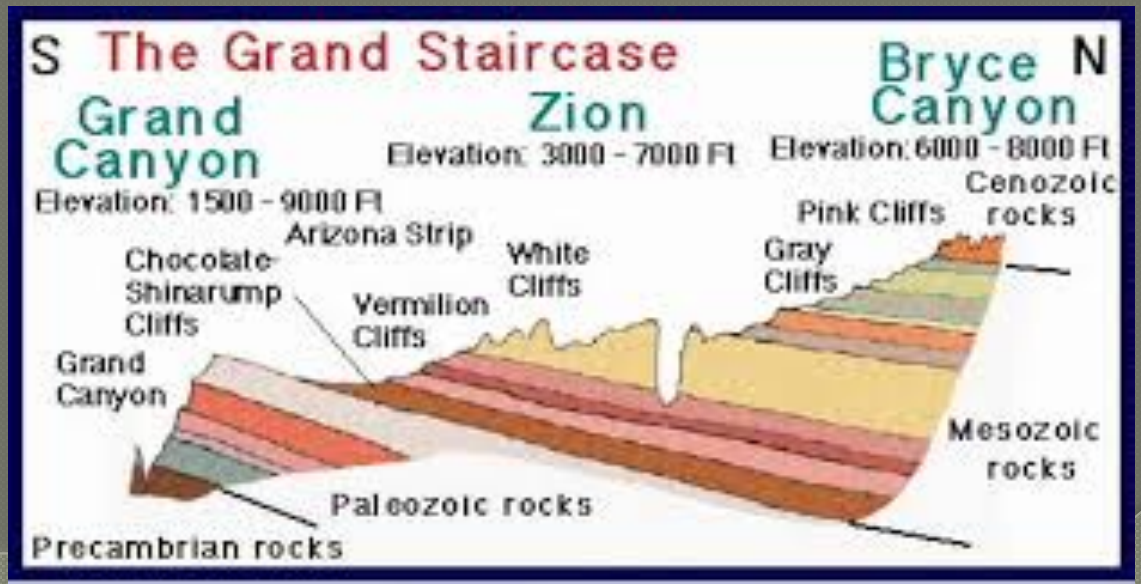
- belt of volcanoes & frequent seismic activity nearly encircling the Pacific.

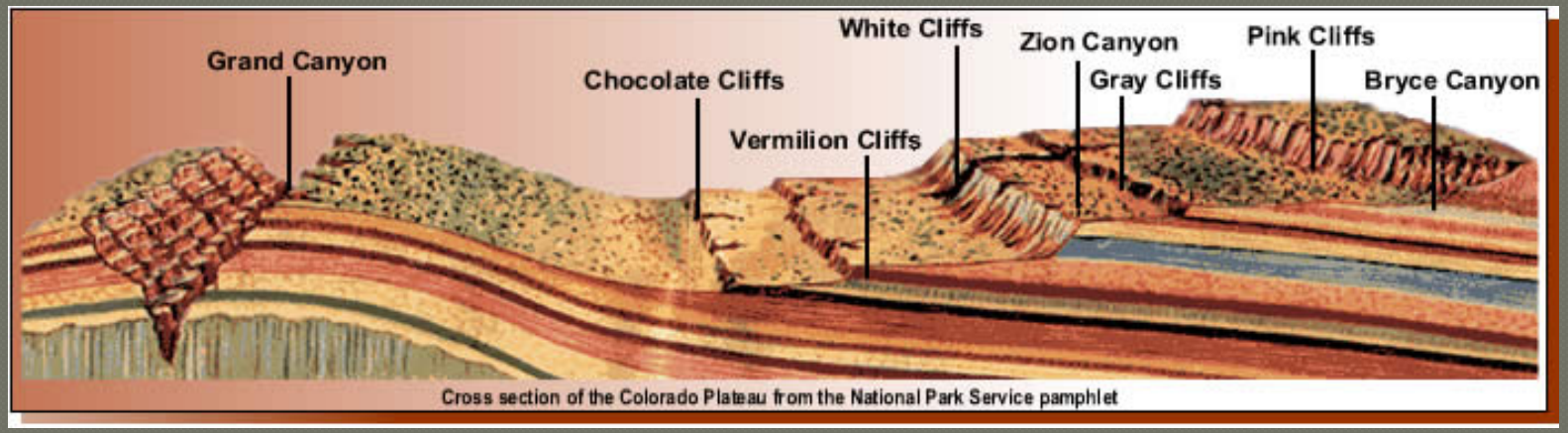




Grand Staircase

- Adjoins Bryce Canyon, Zion Canyon and the Grand Canyon. Only place on Earth.





The Grand Staircase