

# UNIFORMITARIANISM

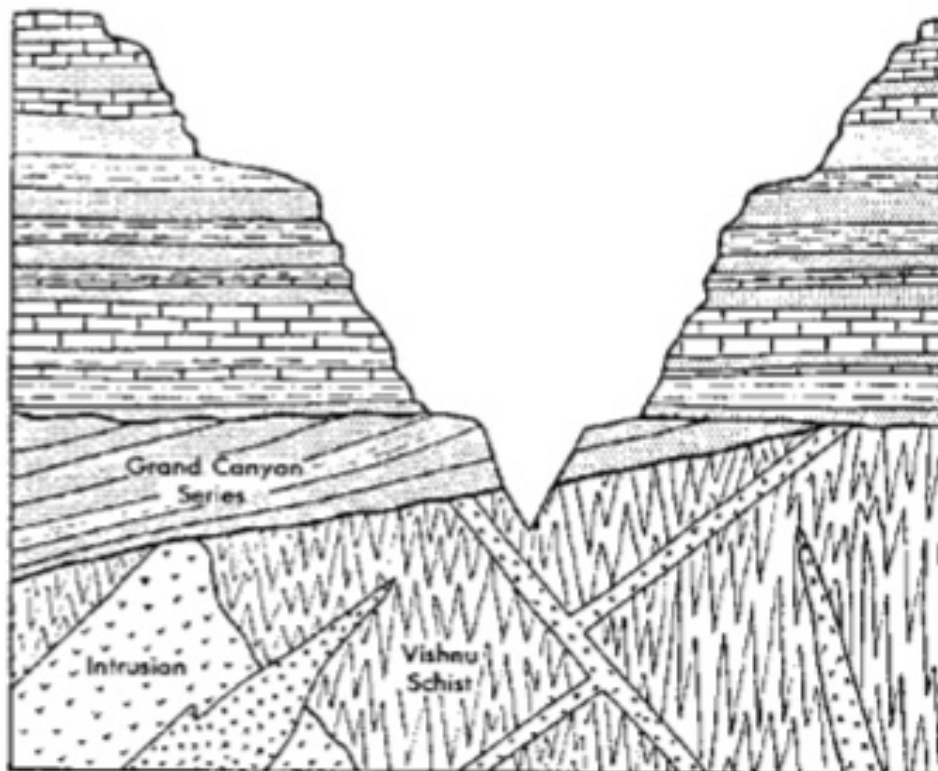


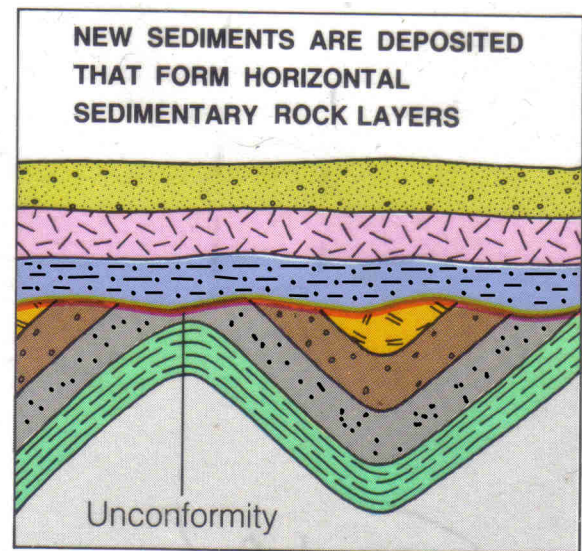
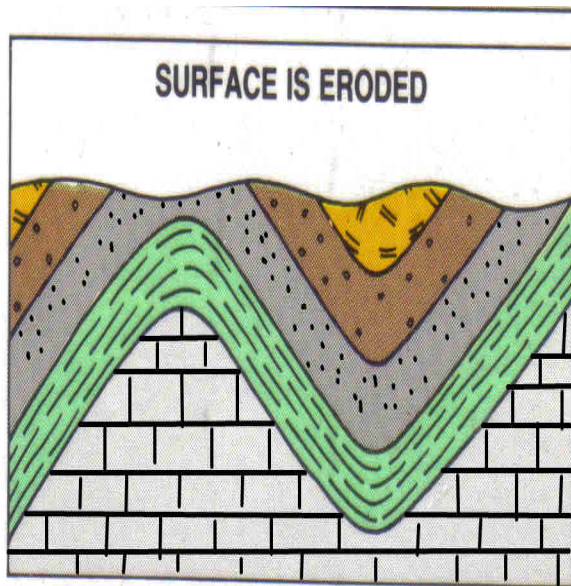
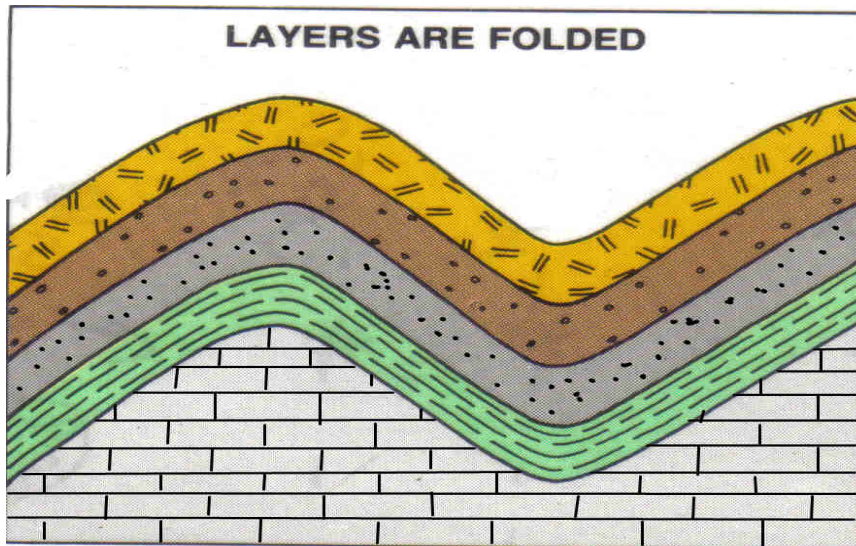
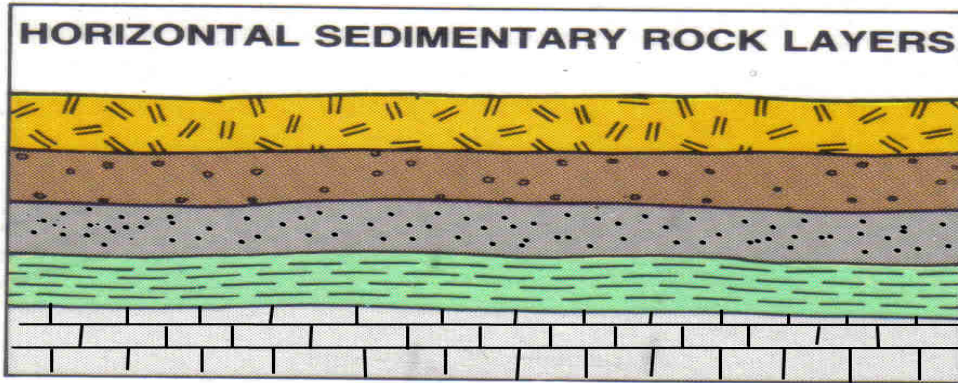
Fig. 1-1. Essentials of the geology of the Grand Canyon.

- The processes that happened in the past is still happening in the present
- “The present is the key to the past.”





# Identify each the Strata layers



# Law of Superposition

Youngest (last) \_\_\_\_\_

List in order  
the cards from  
the oldest to  
the youngest

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

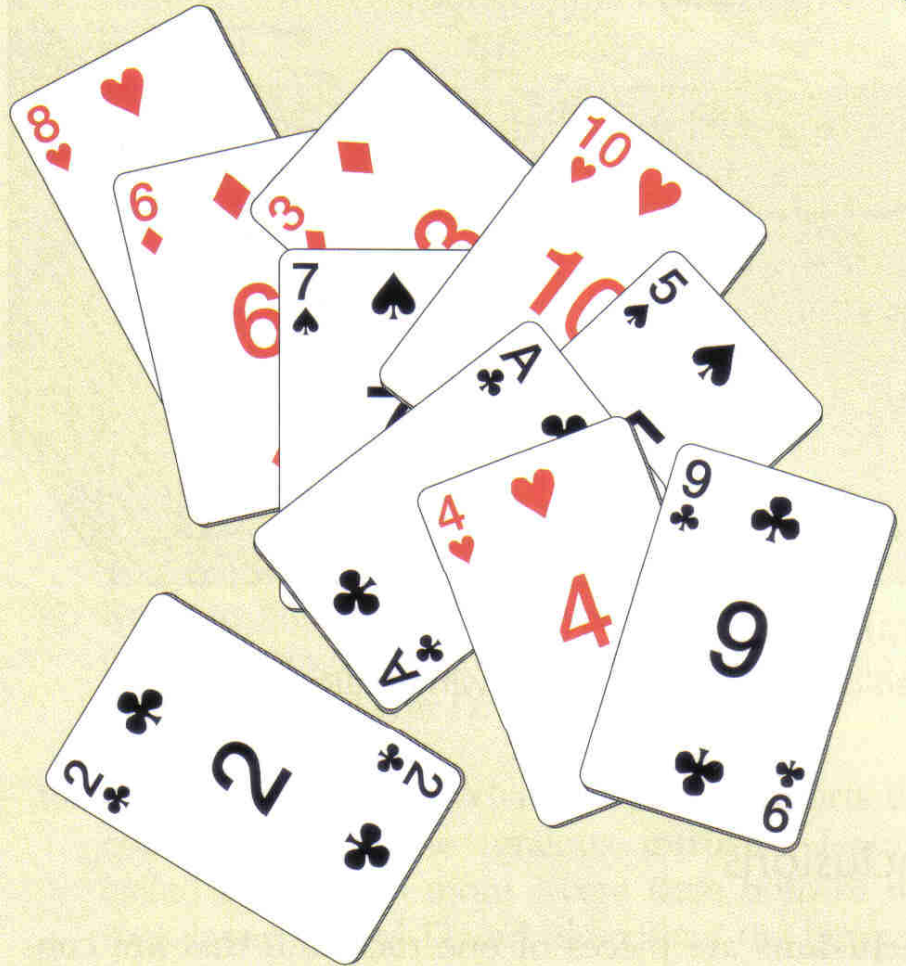
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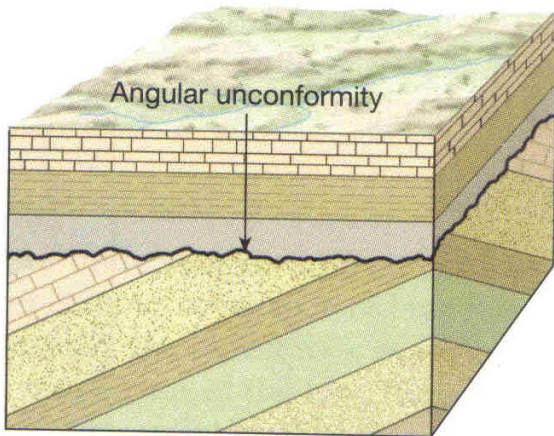
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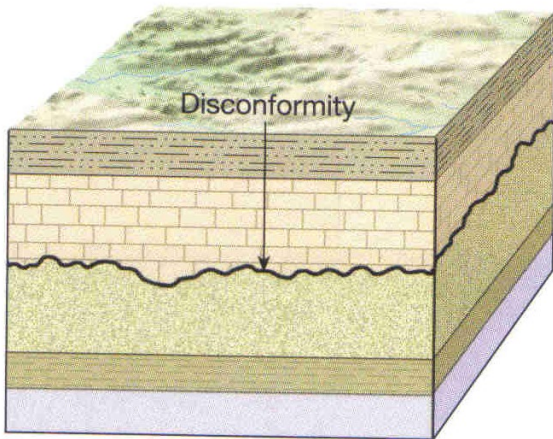
Oldest (first) \_\_\_\_\_



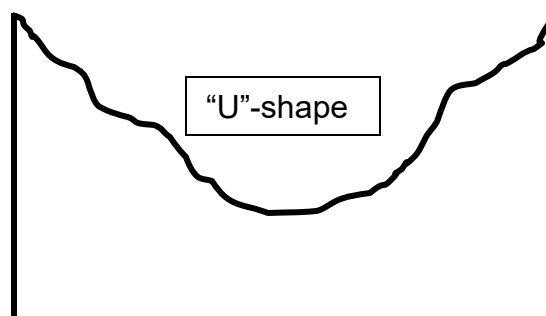
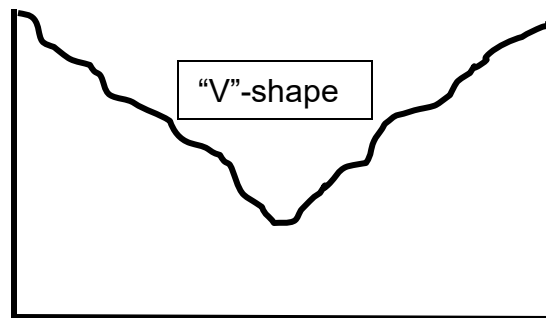
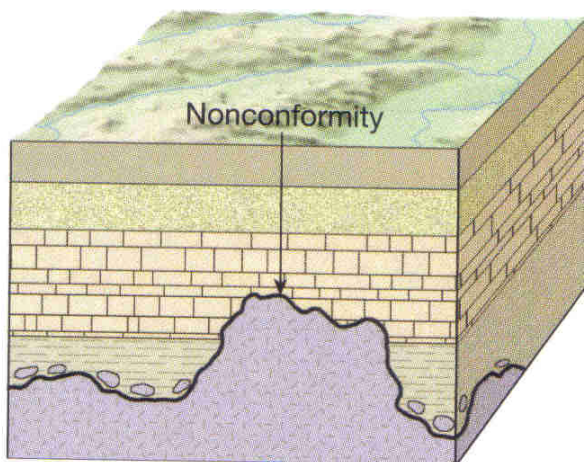
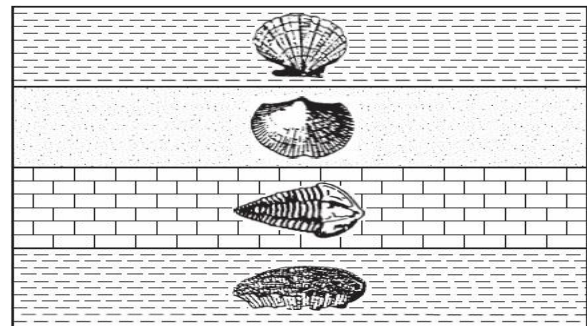
## SEDIMENTARY Strata LAYERS



Sedimentary Rocks (Rx) is the most common while Igneous rocks are the most abundant rock. Igneous rocks cannot contain fossils because they are formed from magma or lava



**Index Fossil** is when a fossil is visible within sediment. The Best sediment is usually Sandstone. Shale is also good.



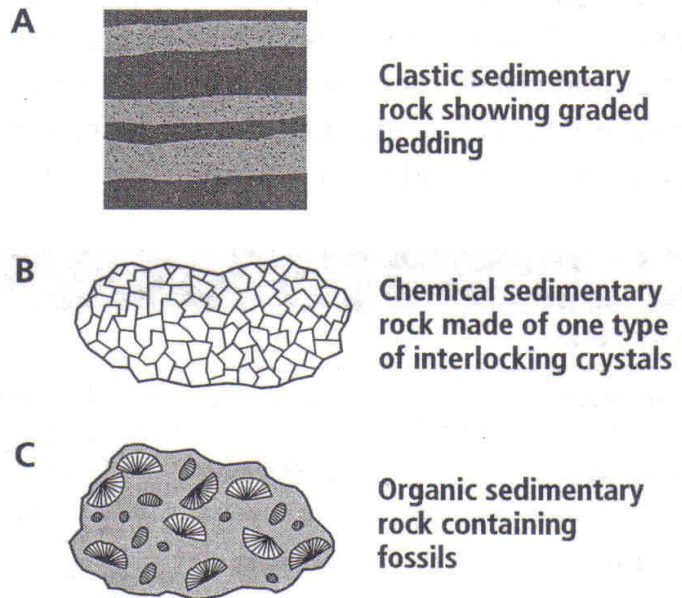
## Sedimentary Classification:

### Stream Velocity:

As stream slows down sediment begins to get deposited.

Sand is usually below 90cm/second

While mud will settle out when stream velocity is REALLY REALLY slow.



**Figure 12-1** Diagrams of clastic, chemical, and organic, sedimentary rocks. Notice the graded bedding of the clastic rock, the mineral crystals in the chemical rock, and the fossils in the organic rock.

## TYPES of SEDIMENT:

### (Gravel)

Boulders  
Cobble  
Pebbles  
Granules

e.g. Conglomerates

### (Sand)

Sand

e.g. Sandstone

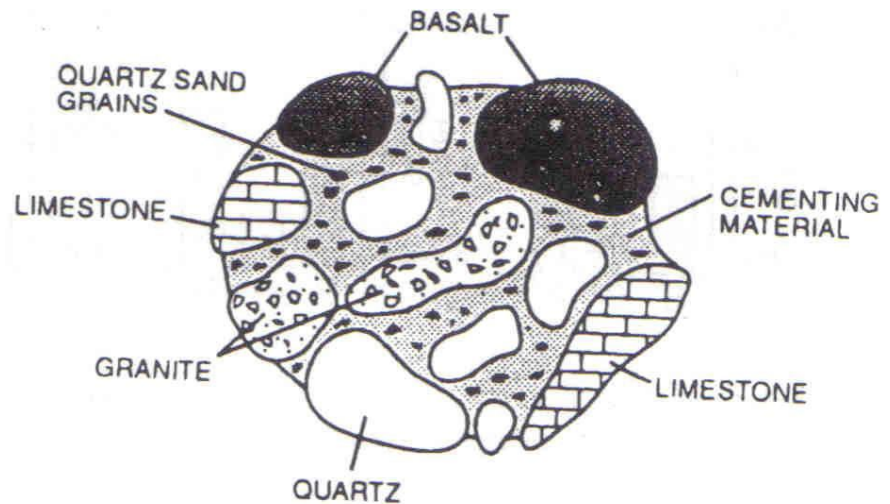
### (Mud)

Silt

Clay

e.g. Siltstone

mudstone or shale

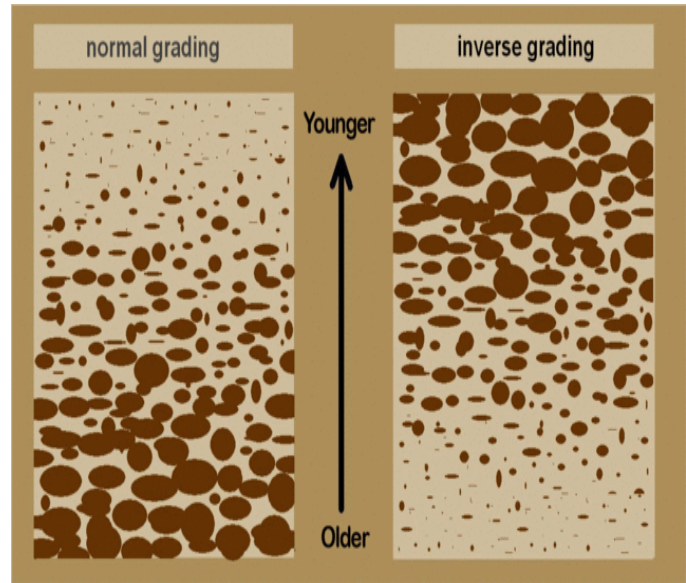


# TYPES of BEDDING, Ripples and Mud NOTES

## Cross Bedding

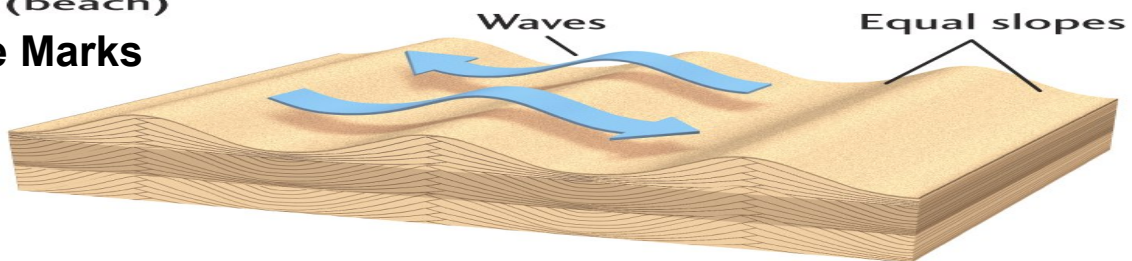


## Graded bedding

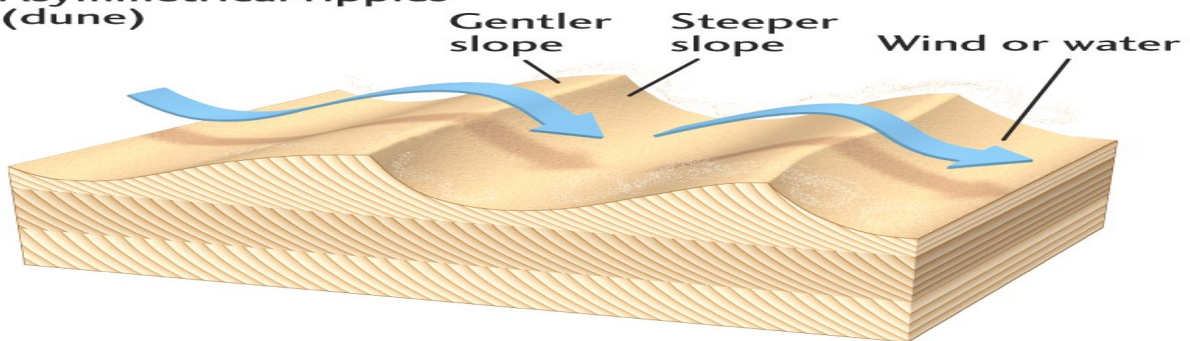


## Ripple Marks

Symmetrical ripples (beach)



Asymmetrical ripples (dune)



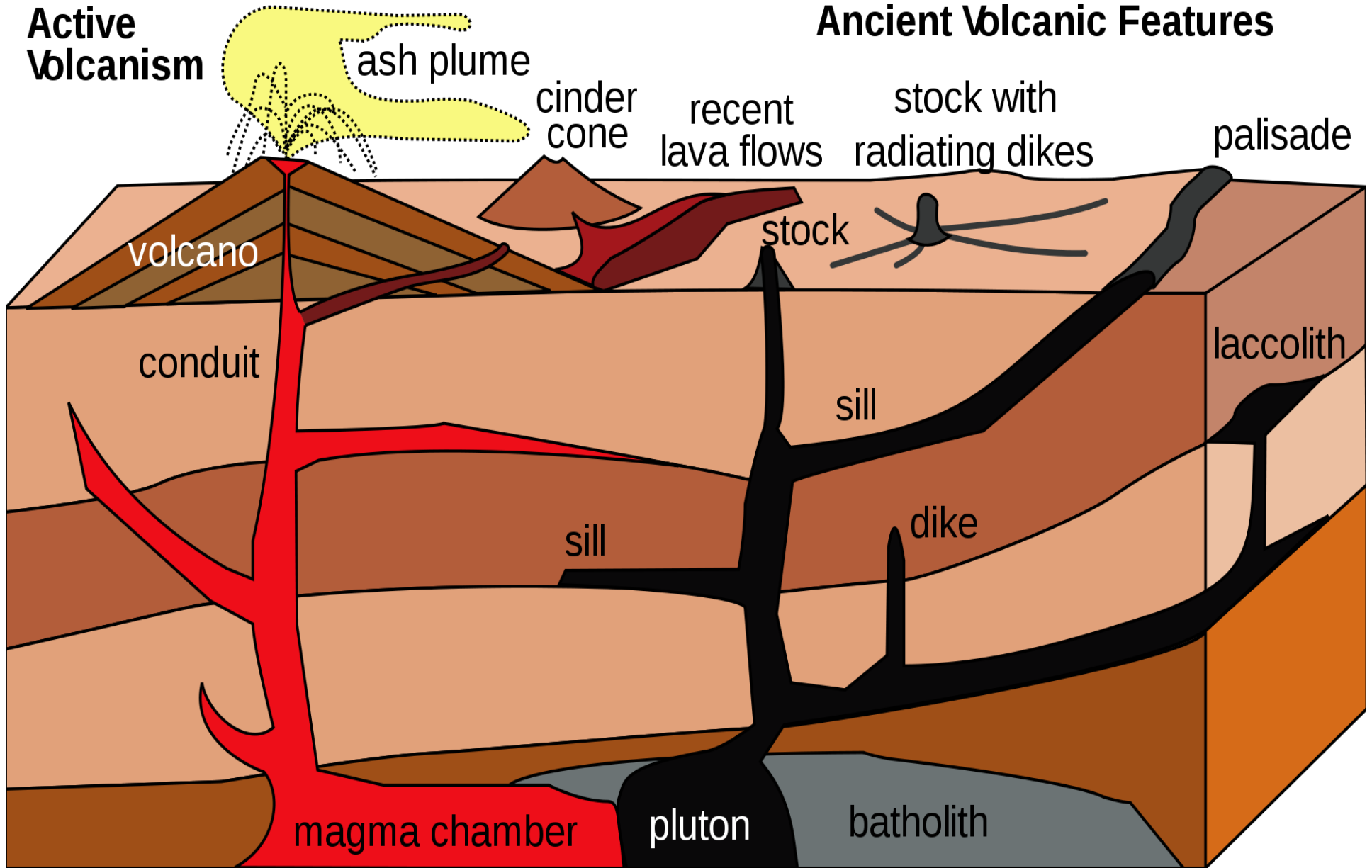
## Mud Cracks





# Active Volcanism

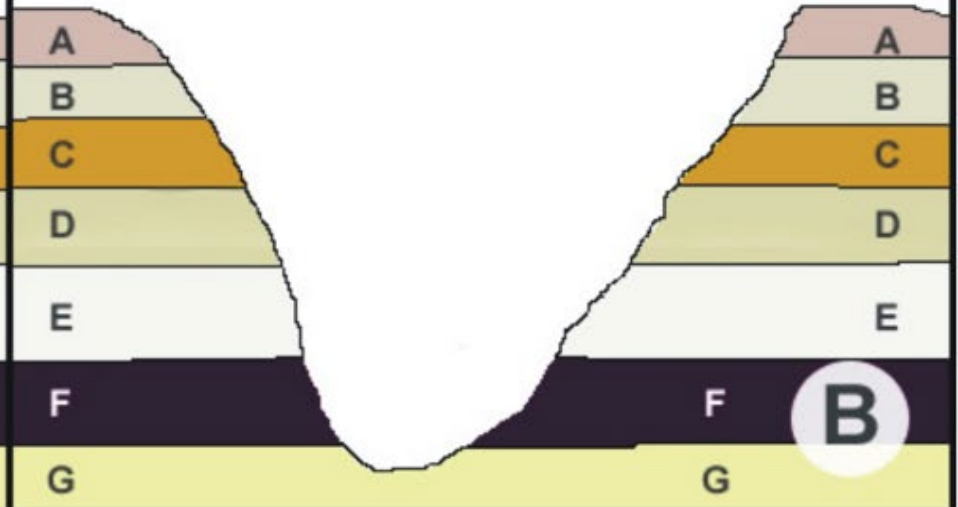
# Ancient Volcanic Features



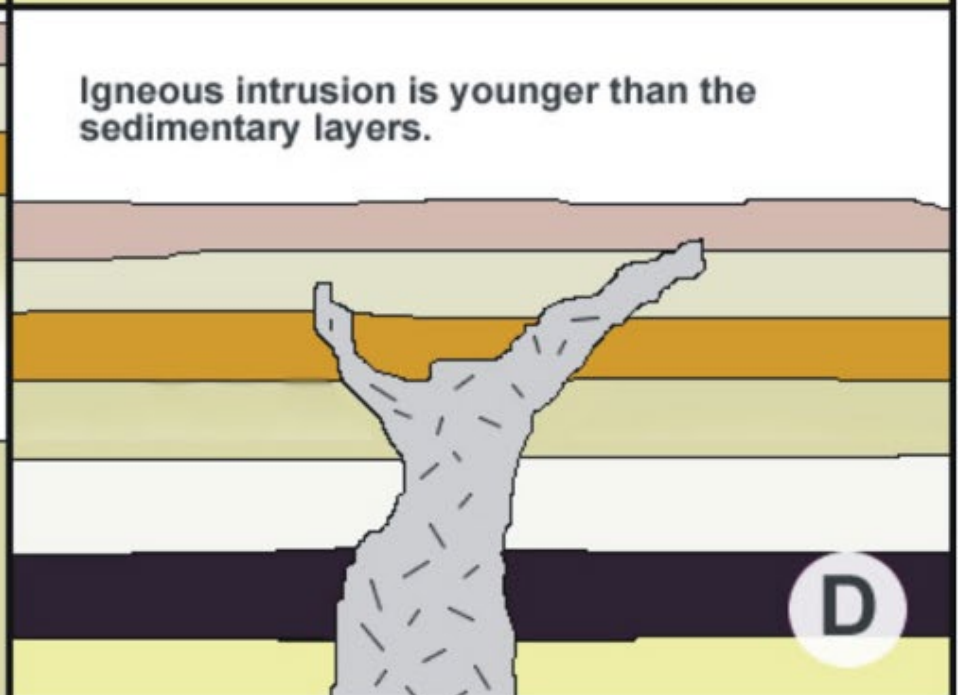
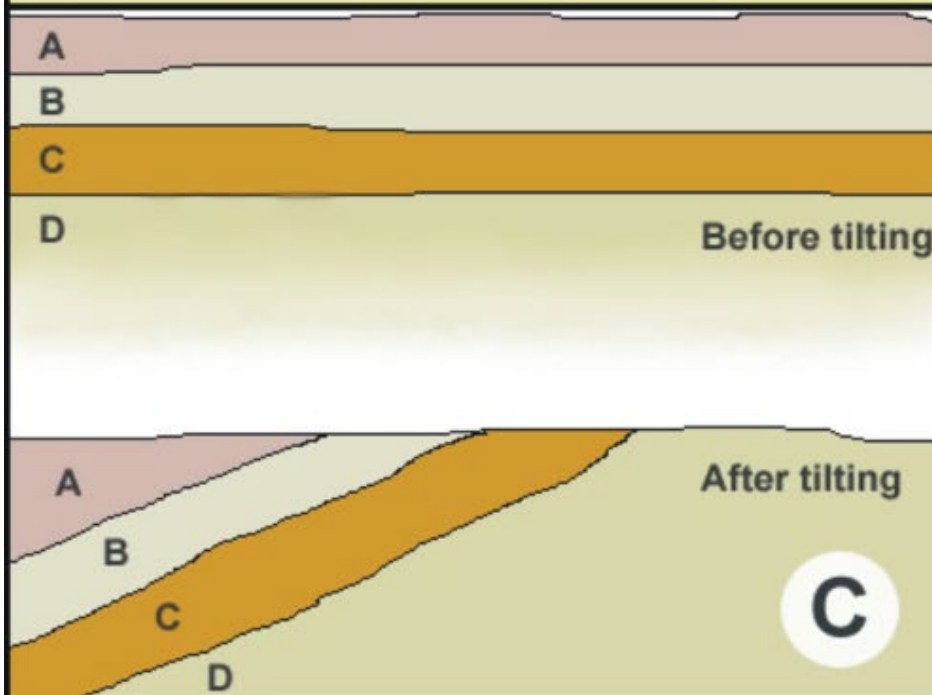
Layer G is the oldest, layer A is the youngest.



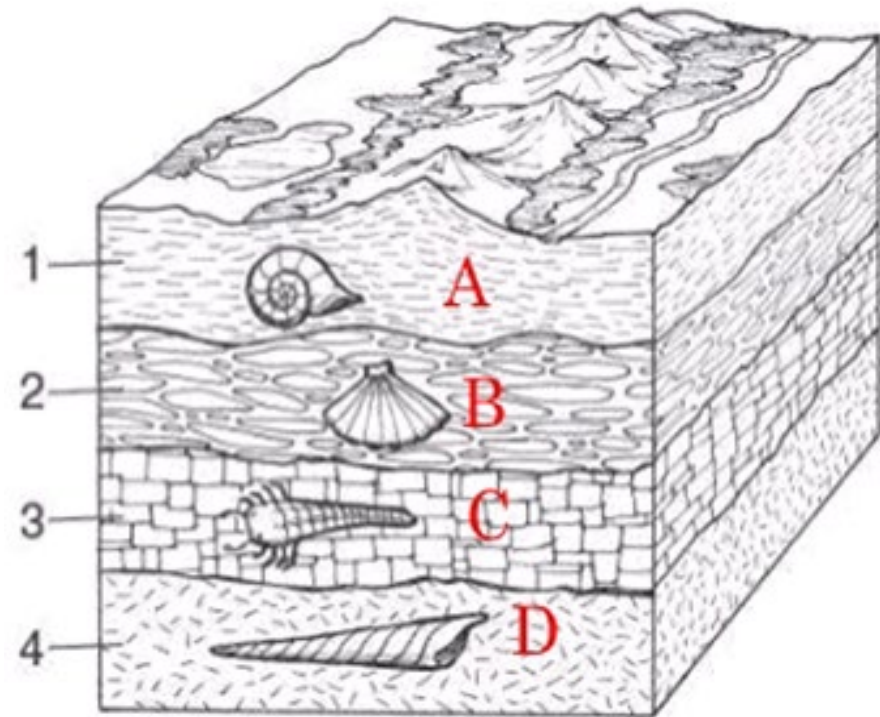
The sedimentary layers can be matched up across the valley.



Igneous intrusion is younger than the sedimentary layers.



1. Which is the Oldest Fossil?
2. Which is the youngest Fossil?
3. Identify each strata layer.
4. Which fossil cannot exist?

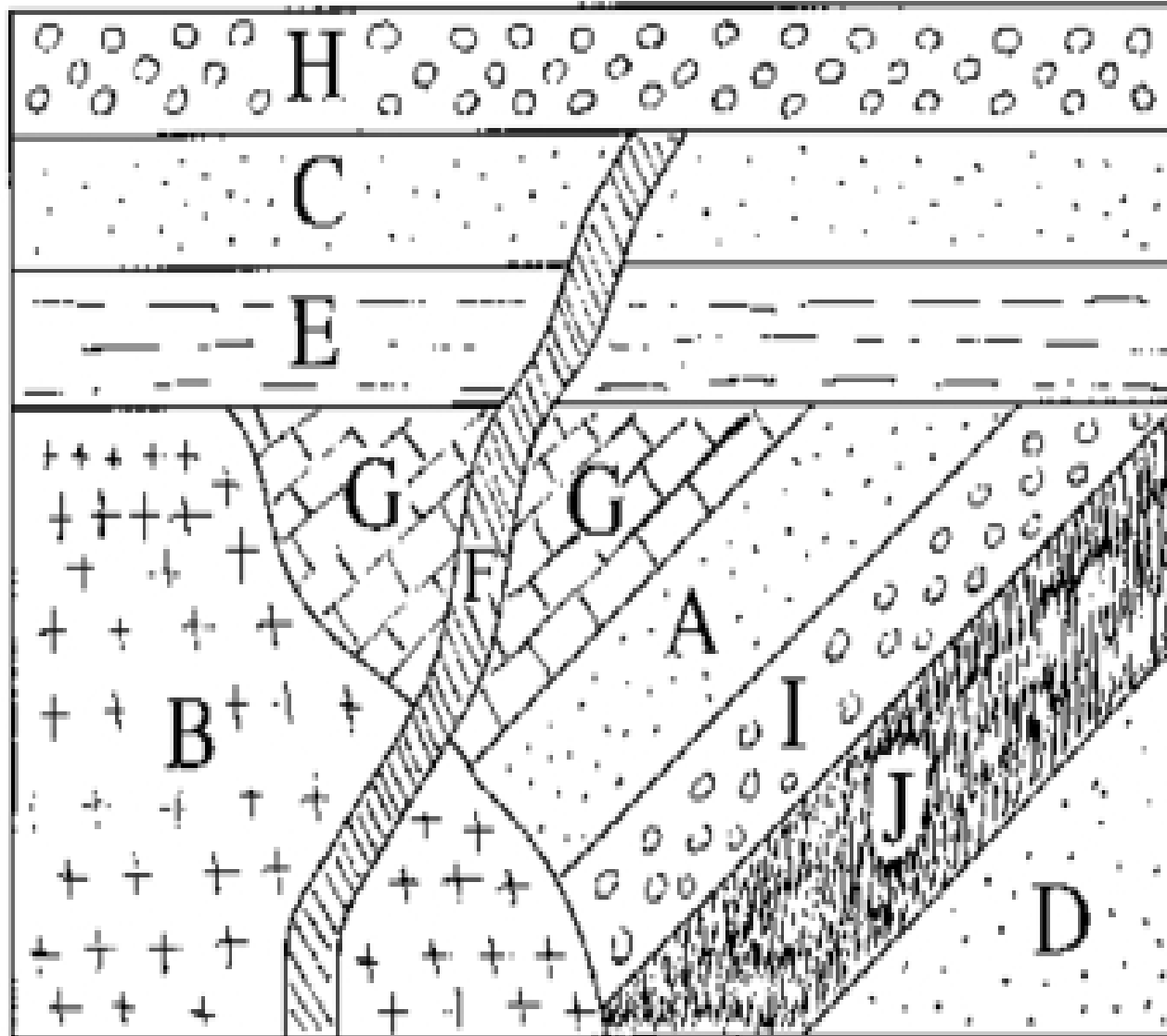


NAME:

DATE:

PD:

Color this page using your rock scheme color chart and the key provided.  
Then Label the rock strata according to the Law of Superposition



## KEY

	CONGLOMERATE
	SANDSTONE
	SHALE
	LIMESTONE
	COAL
	GRANITE
	BASALT

**Table 2.3** Sedimentary rock identification key. Sedimentary rocks are divided into two groups, detrital and chemical, depending upon the type of material that composes them. Detrital rocks are further subdivided by the size of their grains, while the subdivision of the chemical rocks is determined by composition.

DETRITAL ROCKS

CHEMICAL ROCKS

Texture (grain size)		Composition	Rock Name
Coarse (over 2 mm) with large grains		Rounded fragments of quartz and/or chert	<b>Conglomerate</b>
		Angular fragments of quartz and/or chert	<b>Breccia</b>
Medium (1/16 to 2 mm) feels "sandy"		Quartz usually dominates	Feldspathic <b>Sandstone</b> Arkose
Medium (1/16 to 2 mm) feels "sandy"		(If abundant feldspar is present the rock is called <b>Arkose</b> )	Orthoquartzite
		<b>Quartz Arenite</b>	<b>Sandstone</b> Hybrid
Medium (1/16 to 2 mm) feels "sandy"		Feldspathic graywacke	Lithic graywacke <b>Sandstone</b> Lithic Arenite
Fine (1/16 to 1/256 mm)		Quartz and clay	<b>Siltstone</b>
Very fine (less than 1/256 mm)		Quartz and clay	<b>Shale</b>

Composition	Texture (grain size)	Rock Name	
Calcite, $\text{CaCO}_3$ (will effervesce)	Fine to coarse crystalline	<b>Crystalline Limestone</b>	B i o l i t i c a l e
	Visible shells and shell fragments loosely cemented	Oolitic <b>Coquina</b>	
	Various size shells and shell fragments cemented with calcite cement	<b>Fossiliferous Limestone</b>	
	Microscopic shells and clay	<b>Chalk</b> Kaolin	
Dolomite $\text{CaMg}(\text{CO}_3)_2$ (will effervesce if powdered)	Fine to coarse crystalline	<b>Dolostone</b> Dolomite	
Quartz, $\text{SiO}_2$	Very fine crystalline	<b>Chert (light colored)</b> <b>Flint (dark colored)</b>	
Gypsum $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$	Fine to coarse crystalline	<b>Rock Gypsum</b>	
Halite, NaCl	Fine to coarse crystalline	<b>Rock Salt</b>	
Altered plant fragments	Various size fragments	<b>Bituminous Coal</b> Lignite	

Peat

# ROCK Scheme Chart

Rock (Rx) symbols & colors					
IGNEOUS ROCK					
Intrusive		Granite, Granodiorite pink			
Extrusive		<b>Basalt</b> Any igneous rock Black, gray			
		Mafic Lava Flow red			
		<b>Gabbro</b> Intrusive igneous (green) varies			
SEDIMENTARY ROCK					
Detrital		Breccia	Gravel		
		Conglomerate		light brown	
		Cobble, pebbles,			
		Sandstone $SiO_2$ Quartz	Red (Arkose)	Sand	
		Cross-bedding sandstone	Yellow		
		Siltstone	light or	Mud	
		Mudstone, claystone Shale	dark tan		
		Coal in shale	Solid Black	Bioclastic plants	
	Chemical		Limestone $CaCO_3$ Calcite	light blue	Precipitate
			dolomite $CaCO_3$ Calcite	dark blue	
		Rock salt Halite	orange	Evaporate	
		Gypsum	purple		
METAMORPHIC ROCK					
Foliated		Schist or Phyllite (Slate) shale	vary	Layers	
		Gneiss Granite	dark pink	Bands	
Non foliated		Marble Limestone	white	Recrystallization	
		Metaquartzite Sandstone	yellowish white		