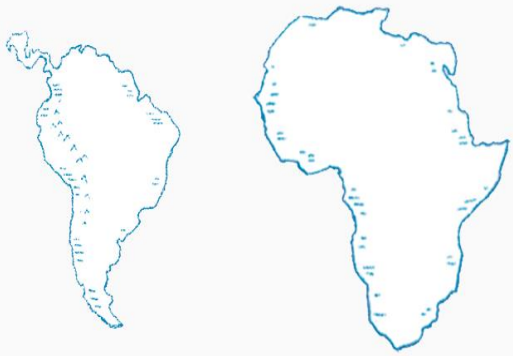
MR. Mohammed Abdalmonem NO. 0506867029

1 Conclude that continentals were once joined, from the evidence of matching coastlines of Africa and South America and how they can fit together like puzzle pieces, give evidence and clues used to test and support Alfred Wegnar's hypothesis

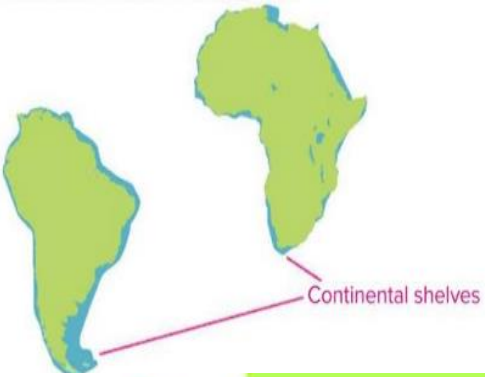
## Why do South America and Africa have matching coastlines?



**1.** Look at the outlines of South America and Africa. The green color represents the land above sea level. The blue areas along the coastlines are the continental shelves—areas of the continents that are under shallow water.

**2.** What do you notice about the shapes of the continents including the continental shelves? What do you think the apparent fit of the continents suggests?

The eastern coast of South America and the western coast of Africa appear to fit together, which suggests they were once joined in the past.




## The Continental Drift Hypothesis

**Matching Coastlines** In 1912, Alfred Wegener, a German scientist, observed the fit of the continents and arrived at a creative explanation for this pattern. What did he conclude?


- **Define Pangaea**

Single supercontinent

2. Describe Wegener's continental drift hypothesis.

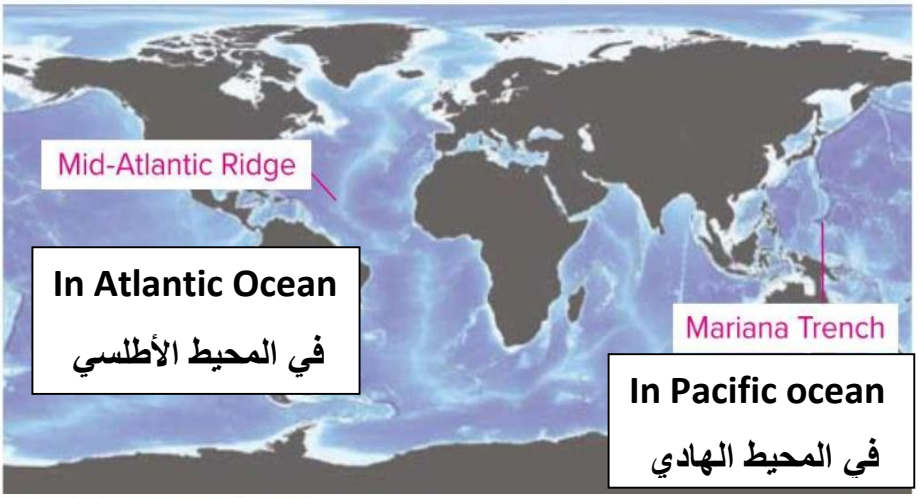
Continental drift suggests that over millions of years, Pangaea split up and the continents drifted over Earth's surface.

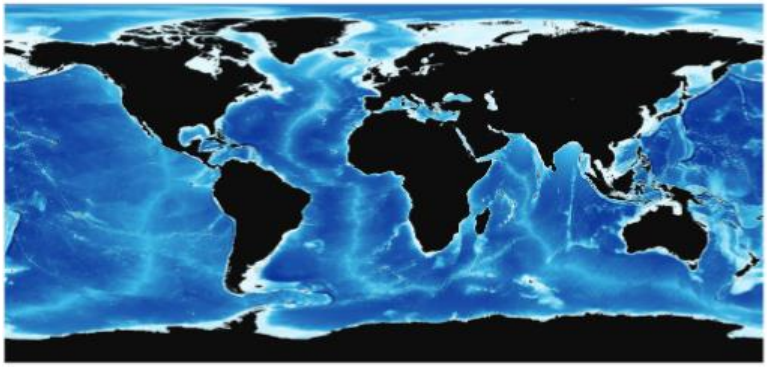
3. If you had discovered continental drift, how would you have tested your hypothesis? Use the space below to jot down ideas of the evidence you would collect and clues you would search for.

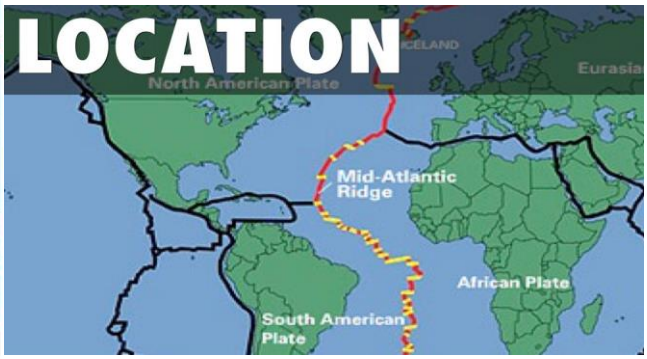
Answers might include the shapes of the continents, matching rock types, matching mountain ranges, or fossil clues.

| | |
|---|---|
| 2 | Analyze the ocean topographic map by identify, classify and interpret various features visible on the ocean floor |

Q: Label the following on the map:



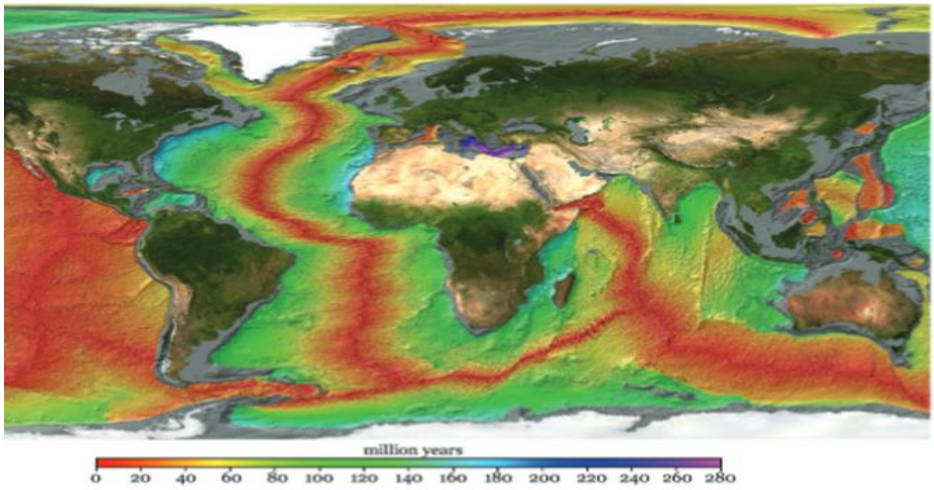






1. Notice the light blue linear features that run along the ocean floors? These are vast mountain ranges deep below the ocean's surface called **mid-ocean ridges**. One such mountain range—the Mid-Atlantic Ridge—runs through the center of the Atlantic Ocean.

2. The maps also revealed that underwater mountain chains had counterparts called ocean trenches. **Ocean trenches** are deep, underwater troughs on the seafloor. The Mariana Trench in the Pacific Ocean is the deepest landform on Earth.

**What pattern can be found on the seafloor?**




- The colored bands are symmetrical on either side of a mid-ocean ridge.

2. In general, where is the youngest crust located?

- The youngest crust, shown in red, is generally located in the center of the oceans.

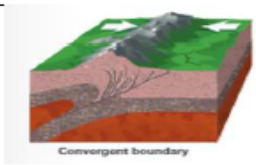
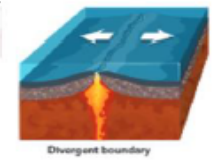
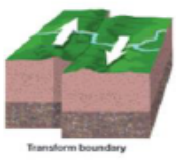
3. Compare the isochrones map to the topographic map of the seafloor in the previous investigation. Which seafloor features are associated with young crust? What can you infer from this?

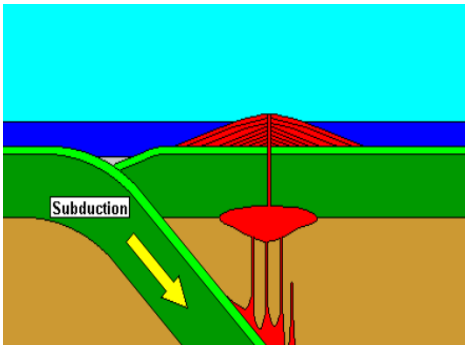
- if Mid-ocean ridges are associated with the youngest oceanic crust. New oceanic crust must form at mid-ocean ridges.

4. How does the age of the seafloor change as you move away from these features? What can you conclude from this evidence?

- As we move away from the mid-ocean ridges, the crust becomes older in symmetrical bands on either side of the ridges.
- This suggests that the crust is carried away in each direction.

| | |
|---|---|
| 3 | Compare and contrast between plate boundaries according to: shape, movment, and location<br>Compare types of volcanoes and Explain how volcanic landscapes form and differentiate types of volcanoes on Earth and Hot spots |

| | **Convergent boundaries** | **Divergent boundaries** | **Transform boundaries** |
|---|---|---|---|
| **Motion** | Push each other / toward each other | Pull each other / Move apart | Slide past each other/ Opposite to each other |
| **Example** | Mountain | Volcano / Mid-ocean ridge | Earthquake / Fault zone |
| **Shape** |  |  |  |




➢ **Subduction**

When two plates collide, one can go under the other and be forced into the mantle**.**

## Volcano Formation

1-Volcanoes form when one tectonic plate subducts below another. (on land or underwater)

**2-** Volcanoes occur at divergent plate boundaries to form mid-ocean ridges (underwater)

- More than 60% of all volcanoes are underwater

## مثال Volcanic Arc

**A volcanic arc is a group of volcanoes that form above a subduction zone in a circular shape.**

## Volcanic eruptions constantly shape Earth's surface:

1- They can form large mountains.

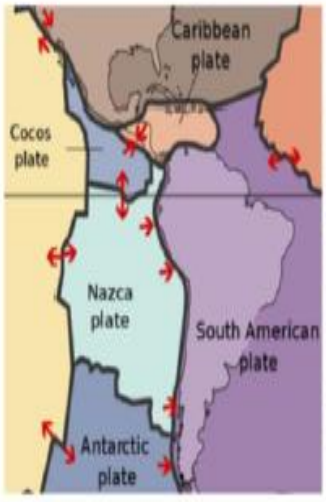
2- Create new crust.

3- Leave a path of destruction behind.

The Andes mountains is formed as the oceanic denser plate "Nazca Plate" is forced under the "South American Plate",

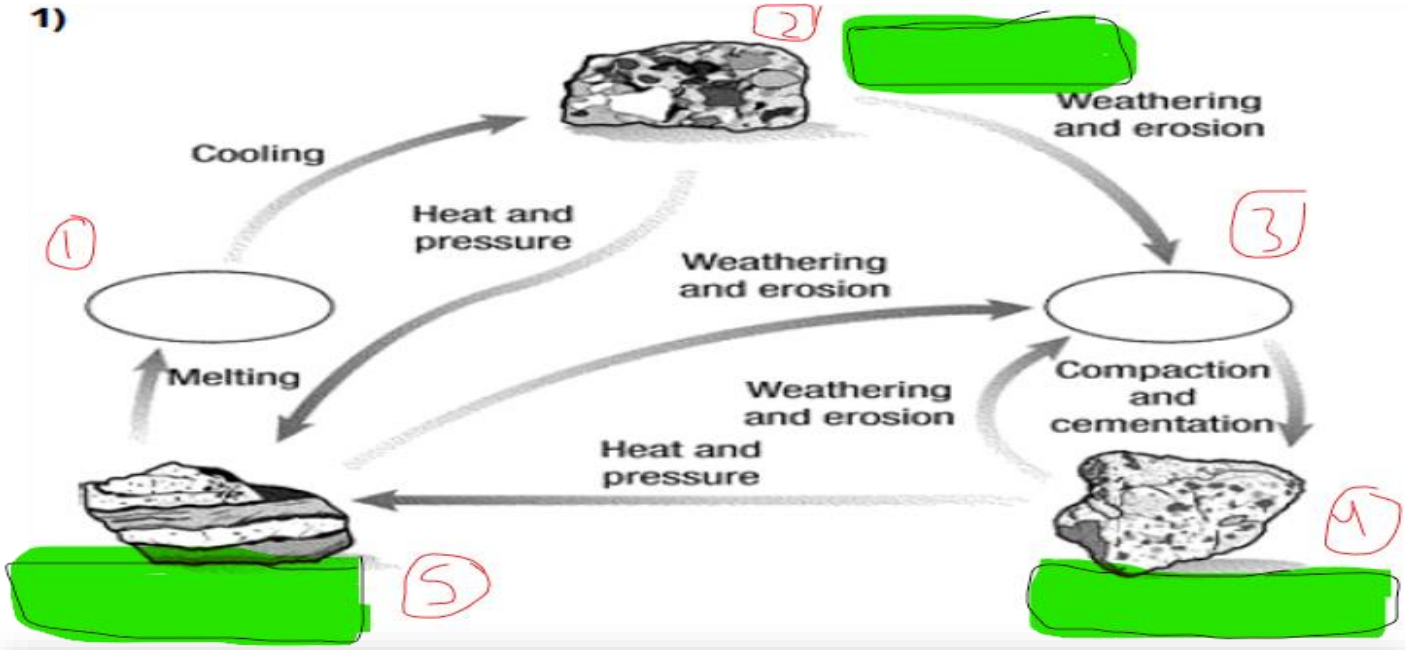
What is the name of this process?

Subduction process.

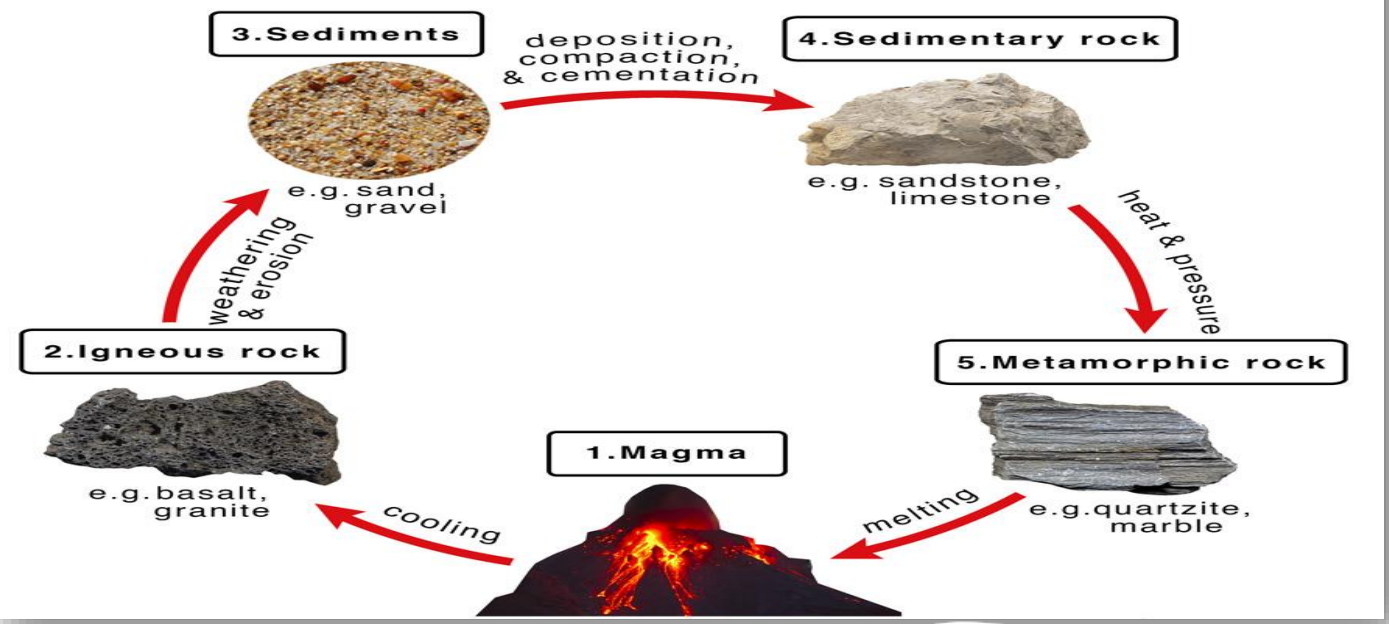



4 Complete the rock cycle and relate types of rocks (sedimentary, Igneous and Metamorphic) together through the processes of weathering

1)




## Steps of the Rock Cycle




### The types of igneous rocks?

| Type | Extrusive Igneous Rock | Intrusive Igneous Rock |
|---|---|---|
| Texture | Small crystals | Large crystals |
| Example | Obsidian  Extrusive rock | Diorite - Granite  Intrusive rock |

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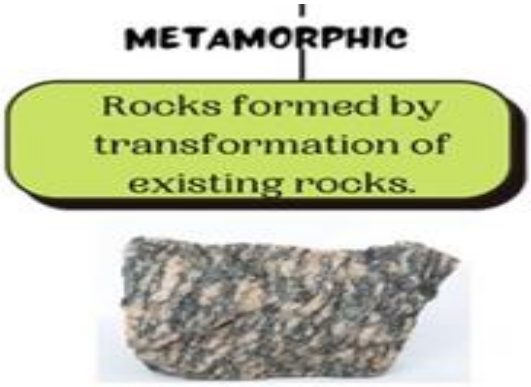
# Types of Sedimentary Rocks?

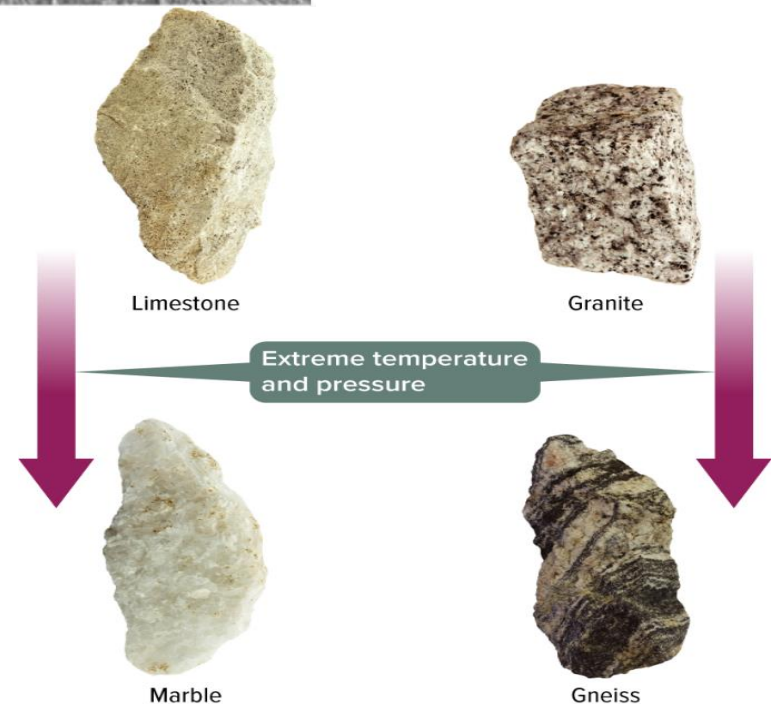
## 1- Clastic Sedimentary Rocks

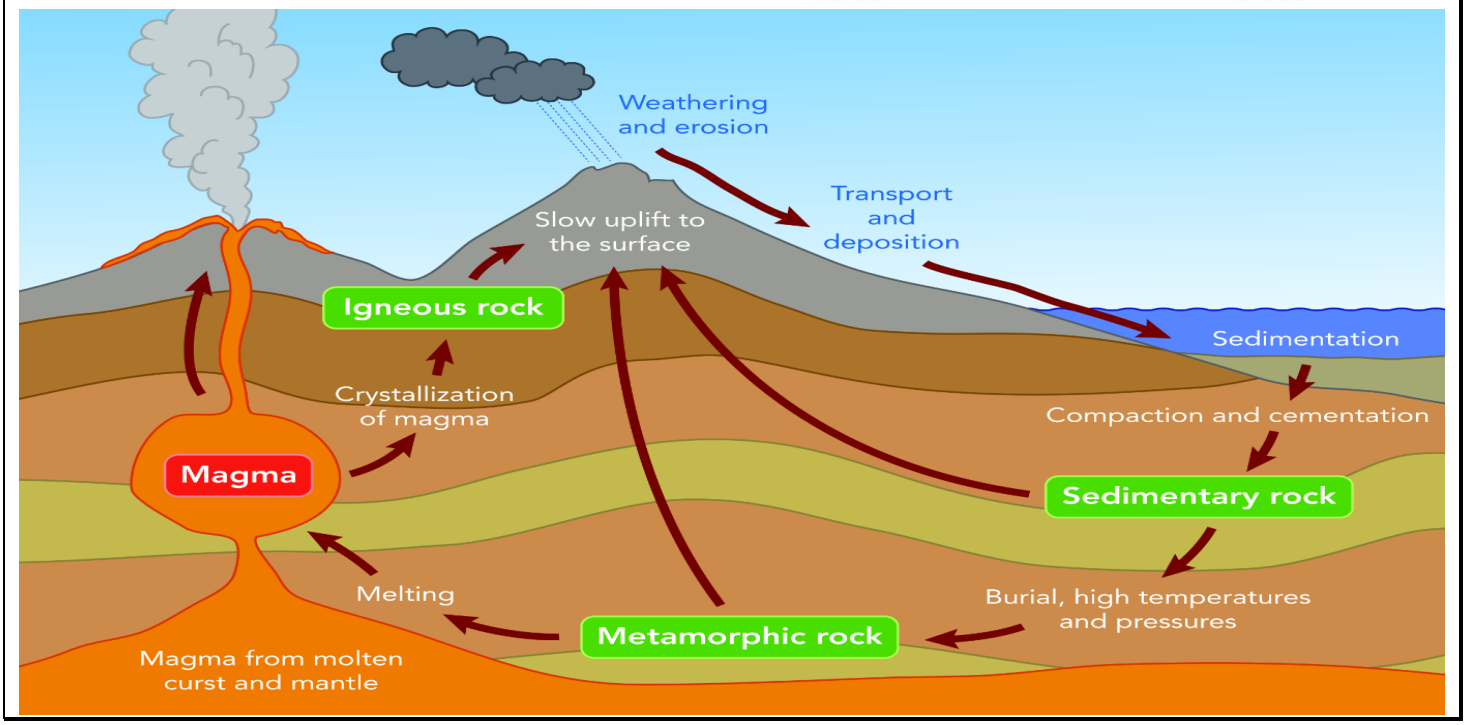
## 2- Chemical Sedimentary Rocks

## 3- Biochemical Sedimentary Rocks

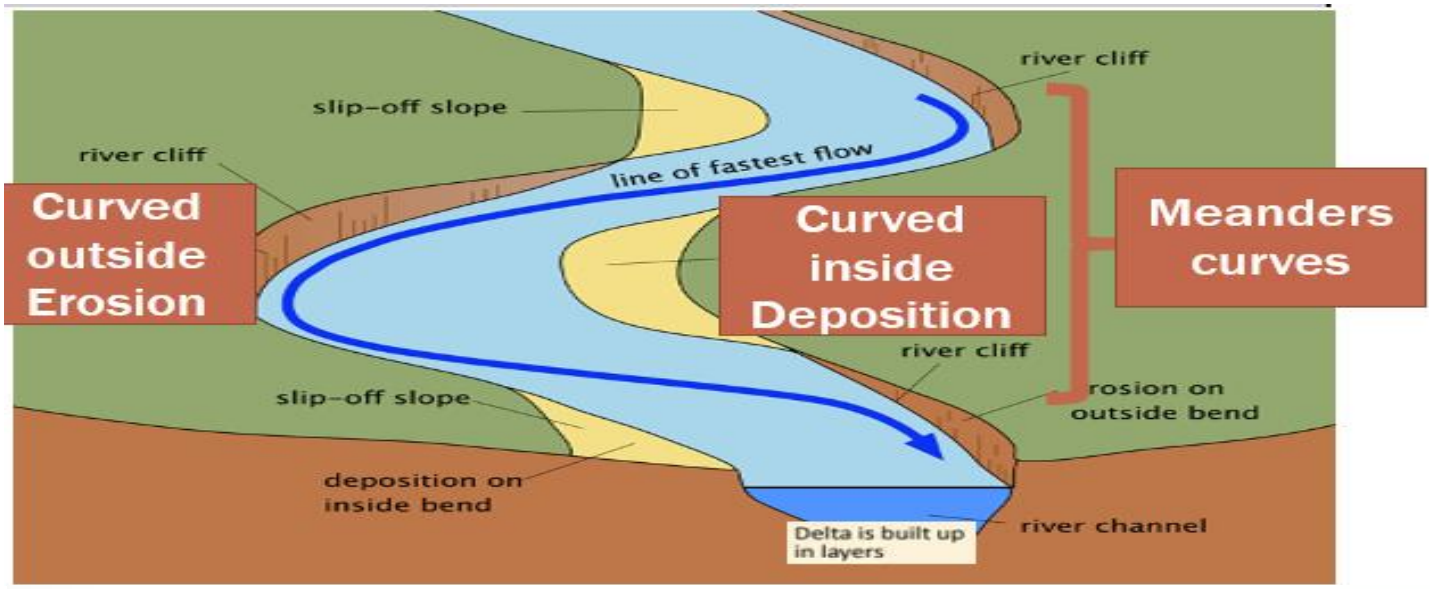
## 3) Metamorphic Rocks formation :



| | |
|---|---|
| 5 | List the processes that change Earth's surface (Weathering, erosion, deposition) and conclude how water and wind play a significant role in changing the Earth's surface and assgin examples of land features resulted from these processes<br>Compare between chemical & physical change |




| | |
|---|---|
| Water | - causes physical and chemical weathering both above and below Earth's surface.<br>- causes most erosion and deposition.<br>- fast-moving water erodes more than slow-moving water<br>- slow-moving water deposits more than fast-moving water |
| Wind | - when strong enough, can cause erosion.<br>- can change desert landscapes<br>- can pick-up, transport, and suspend small grain materials |

**7)** Mechanical weathering _____.

- ○ **A)** breaks apart rocks by physical processes
- ○ **B)** occurs when chemical reactions dissolve or change the minerals in rocks
- ○ **C)** occurs when iron is exposed to oxygen and water
- ○ **D)** none of the above

**8)** Chemical weathering _____.

- ○ **A)** is caused by freezing and thawing
- ○ **B)** breaks apart rocks by physical processes
- ○ **C)** occurs when chemical reactions dissolve or change the minerals in rocks
- ○ **D)** none of above

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## Q: Match the following:

| | | |
|---|---|---|
| Sand dunes | Strong winds can cause sand, silt, and ice to sandblast rock, forming polished, smooth rock formation |  |
| Loess | As wind carries weathered sediment along, the sediment cuts and polishes exposed rock and make an abrasion. |  |
| Arches | Wind picks up fine sediment and deposit it as a thick layer or dust over time. |  |
| Scoured and sandblasted rocks | The shapes are formed by the direction the wind is blowing grains of sand. |  |

- **What processes change Earth's surface over time?**

### Weathering

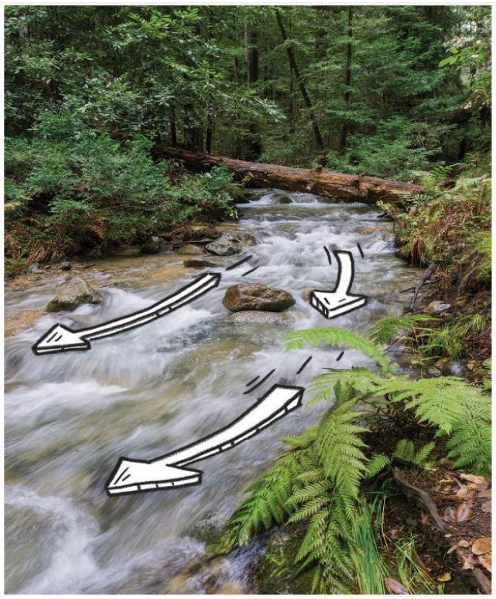
- Any natural process that changes objects on Earth's surface over time

Physical weathering physically breaks down rock without changing the chemical composition of the rock.

Chemical weathering dissolves minerals and breaks down rocks by chemical reactions.

### Erosion and Deposition

- **Erosion** to describe the moving of weathered material, or sediment, from one location to another.
- **Erosion** occurs on the outside of bends where water flows faster.



- **Deposition** is the laying down or setting of eroded material.
- **Deposition** occurs on the inside of bends where water flows slower.