Watch the next few slides. When the slides stop transitioning get with an elbow partner to discuss the events that caused the formation of the beautiful features. Be as specific as possible.


Discuss with an elbow partner and be ready to share.

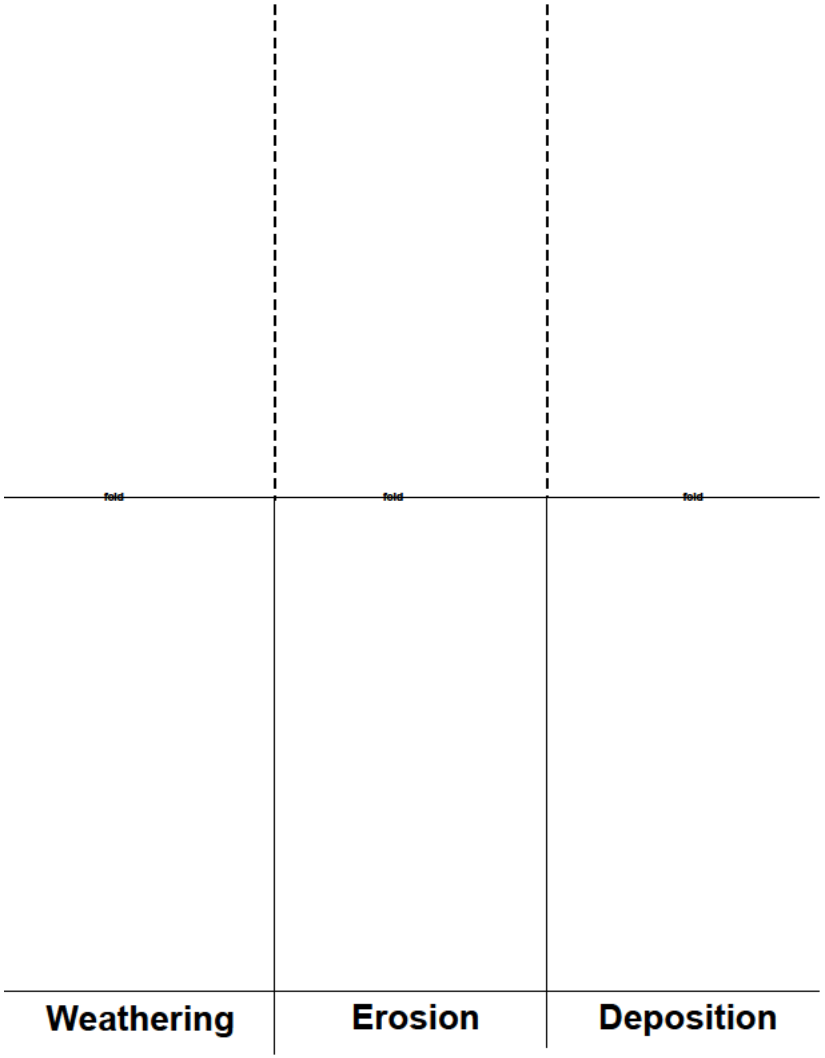
Essential Question: How do changes in the Earth's surface occur over time?

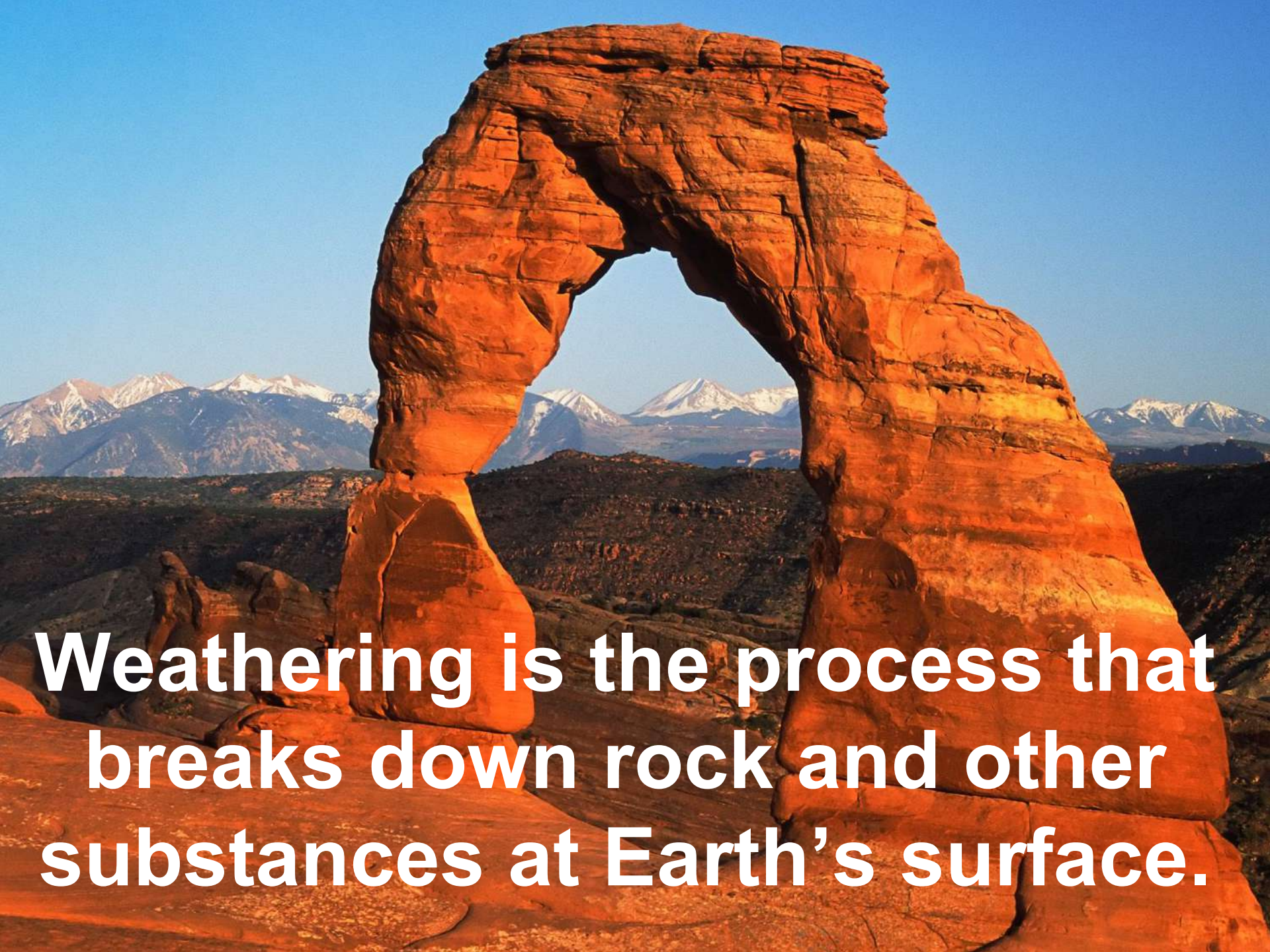
Standard:
S6E5f. Explain the effects of physical processes (plate tectonics, erosion, deposition, volcanic eruption, gravity) on geological features including oceans (composition, currents and tides).

In the previous lesson you learned about processes that can change rocks.

Now we are going to examine processes that change the surface of the Earth.

Use your foldable to take Notes




Weathering is the process that breaks down rock and other substances at Earth’s surface.

Weathering wears mountains down to hills and can produce strange rock formations like in the previous slide.

There are two types of weathering:

- Mechanical (Physical) Weathering
- Chemical Weathering

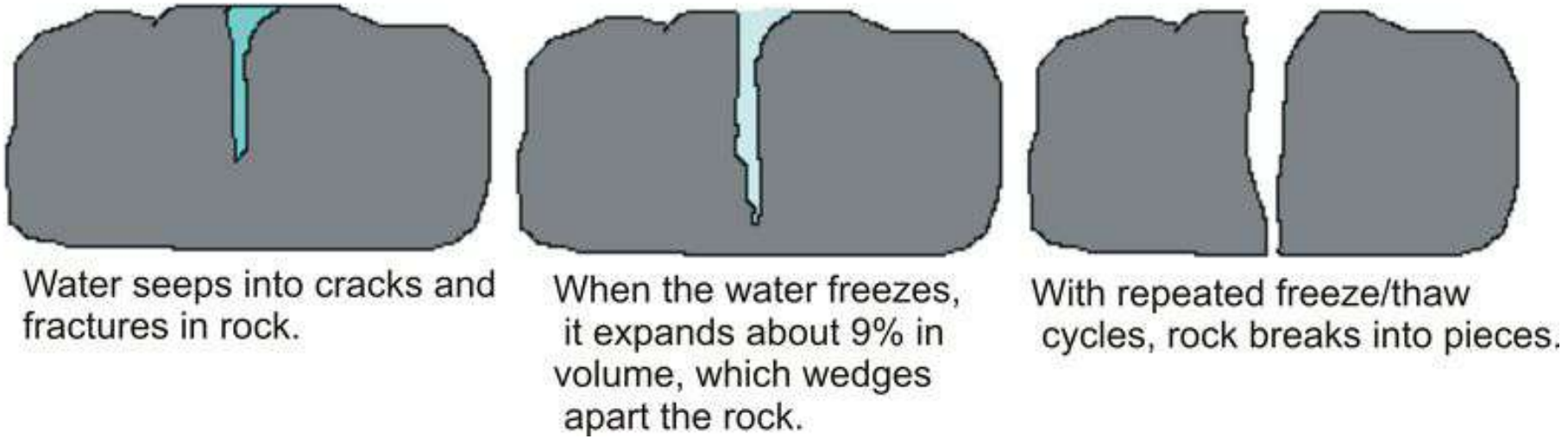
Mechanical Weathering

- Rocks are broken apart by physical processes (heat, water, ice, pressure, temperature, etc.)
- The overall chemical makeup of the rock stays the same
- The rock has just changed shape or size-not the inside composition

Example of Mechanical Weathering:

Ice Wedging

Mechanical Weathering: Ice Wedging



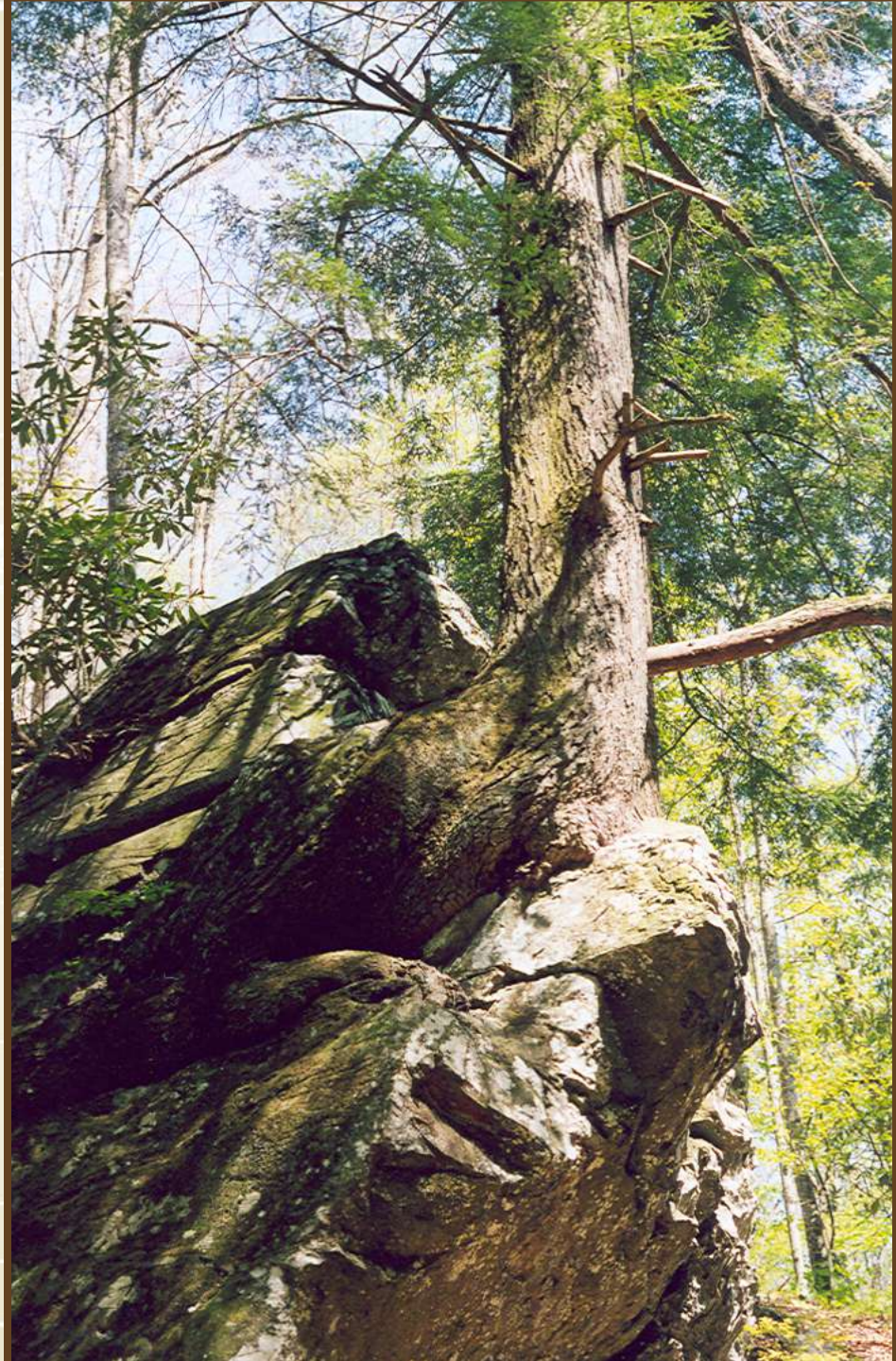
Weathering and erosion - Freeze thaw weathering [1:20]

http://www.harcourtschool.com/activity/science_up_close/307/deploy/interface.html

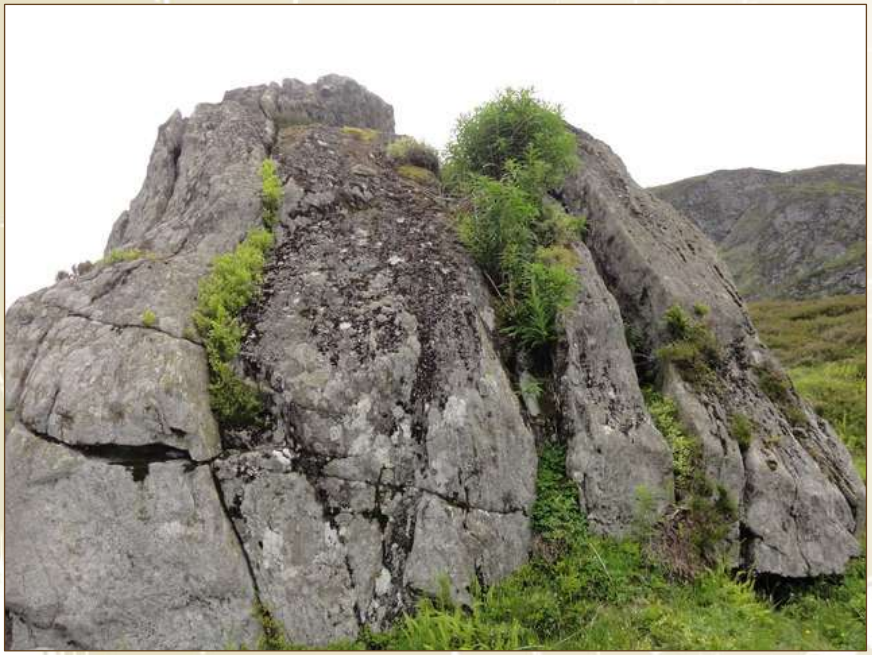
Mechanical Weathering: Ice Wedging

Example of Mechanical Weathering:

Root Action by plants

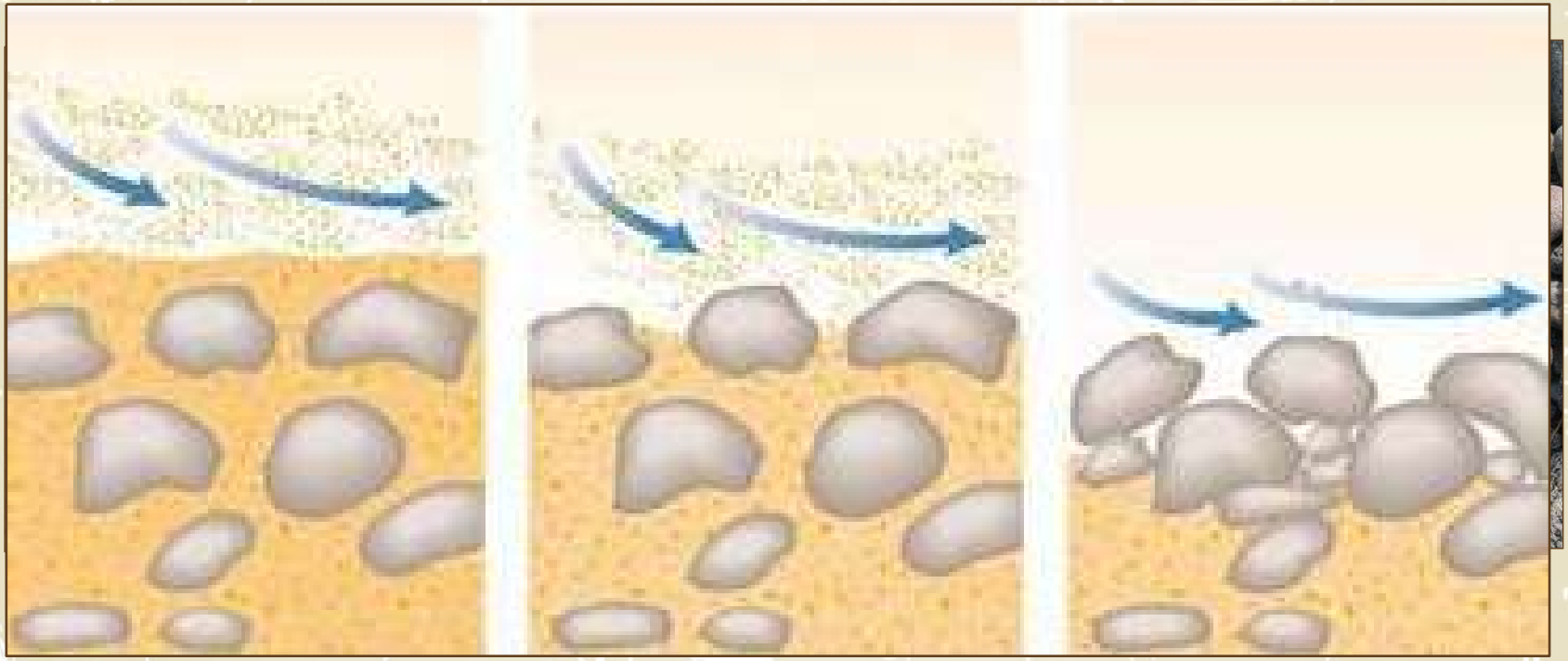


Water and nutrients collect in the cracks of rocks that can result in the growth of plants. As the roots grow, they enlarge the cracks.



Burrowing animals also cause mechanical weathering. They loosen sediment and push it to the surface as they burrow (dig).

Weathering can also occur by the rubbing of one object or surface against another [Abrasion].



Turn to an elbow partner and describe examples of mechanical weathering you have observed recently [in real life not the activator] or in the past.

Chemical Weathering

Chemical reactions dissolve or change the minerals in rocks or change them into different minerals [changes the chemical composition]

Example of Chemical Weathering:

Rocks and minerals can dissolve in acidic waters.

Acid

Acid Rain(debatable)

causes the copper to turn into copper oxide, copper sulfate, copper hydroxide or copper chloride because of the oxidation-reduction reaction and this is basically copper salts or in other words, tarnish

Example of Chemical Weathering:

The chemical compounds (mixes) in rock can breakdown due to a reaction with water [Hydrolysis]. An example is Feldspar changing to Clay.

Chemical Weathering Feldspar into Clay [28 sec]

Animation of Chemical Weathering

Example of Chemical Weathering:

When minerals containing iron are exposed to water and oxygen in the air, the iron reacts to form a new material that looks like rust [Oxidation].

Due to oxidation, iron-containing minerals like magnetite can weather to form a rust-like material called limonite.

Magnetite

Limonite

Turn to an elbow partner and discuss how making, baking, and eating chocolate chip cookies is similar to mechanical and chemical weathering.

Mechanical and Chemical Weathering: Breaking or Baking? [2:50]

Weathering Activities

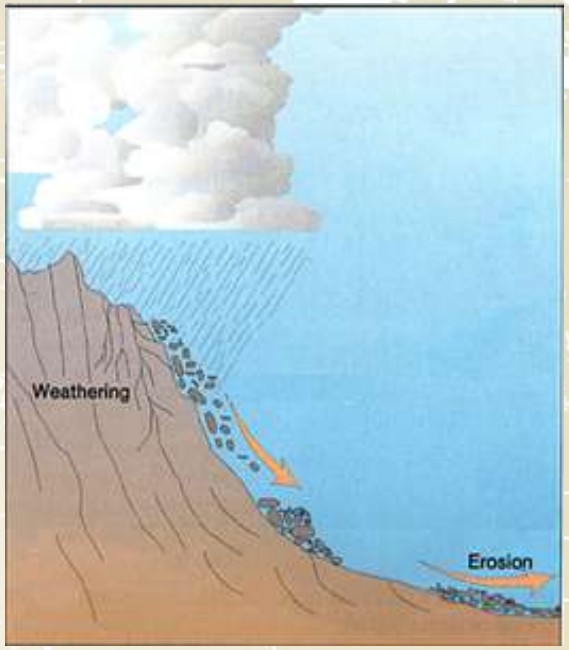
[see resources]

Erosion

Erosion transports weathered rock material.

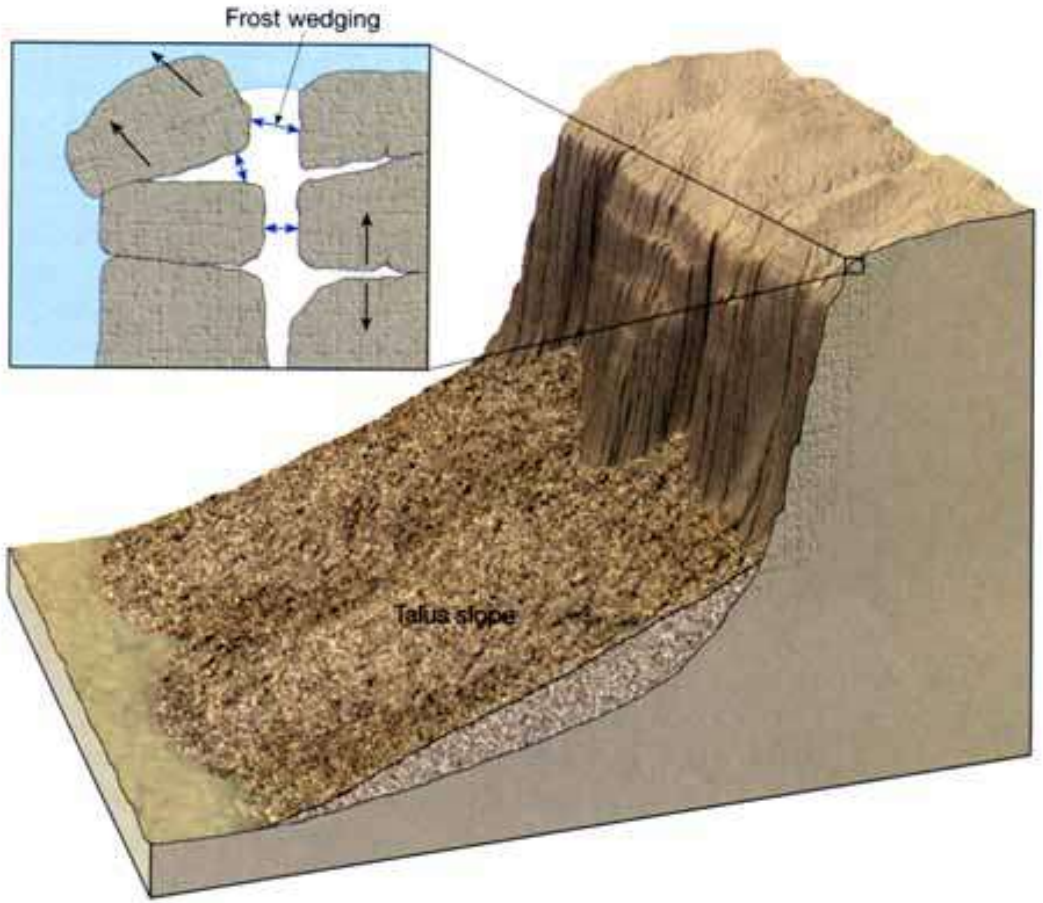
What are some ways that weathered material can be transported?

Erosion by Gravity



Rocks and other materials, especially on steep slopes, are pulled toward the center of Earth by gravity.

Here, the weathering occurs by frost wedging

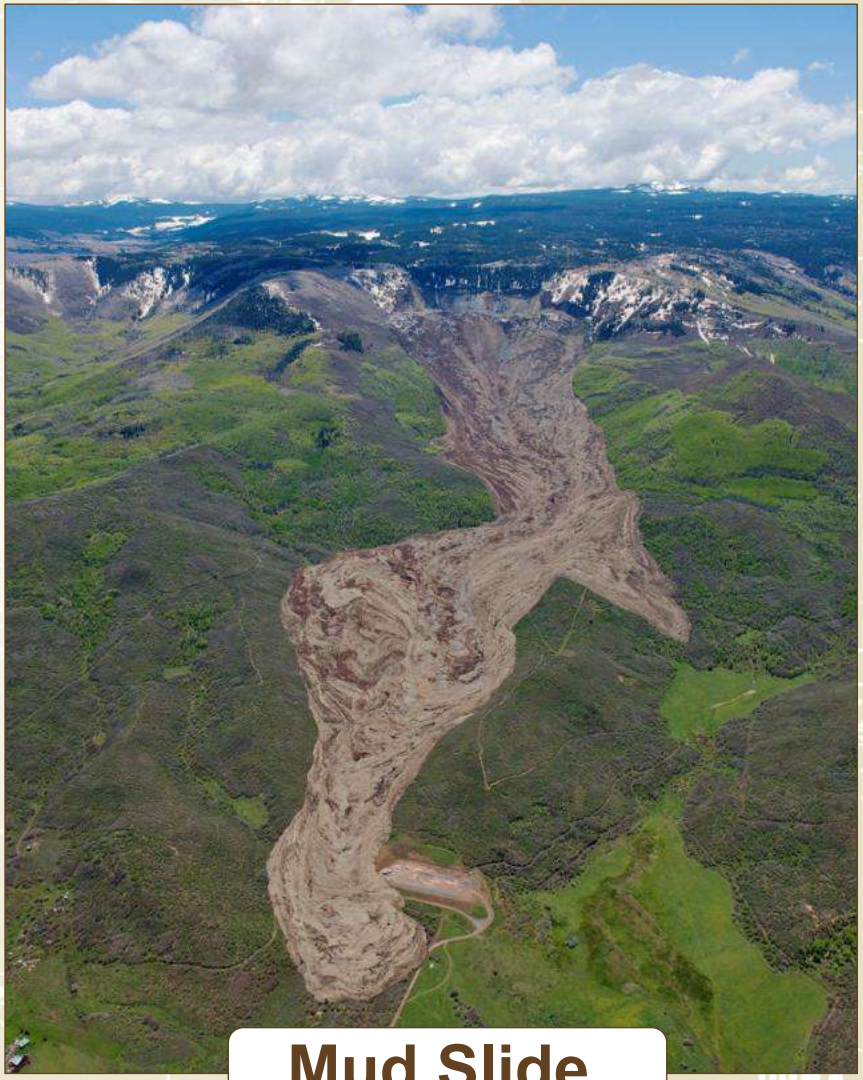


The erosion occurs by gravity

Erosion by Gravity

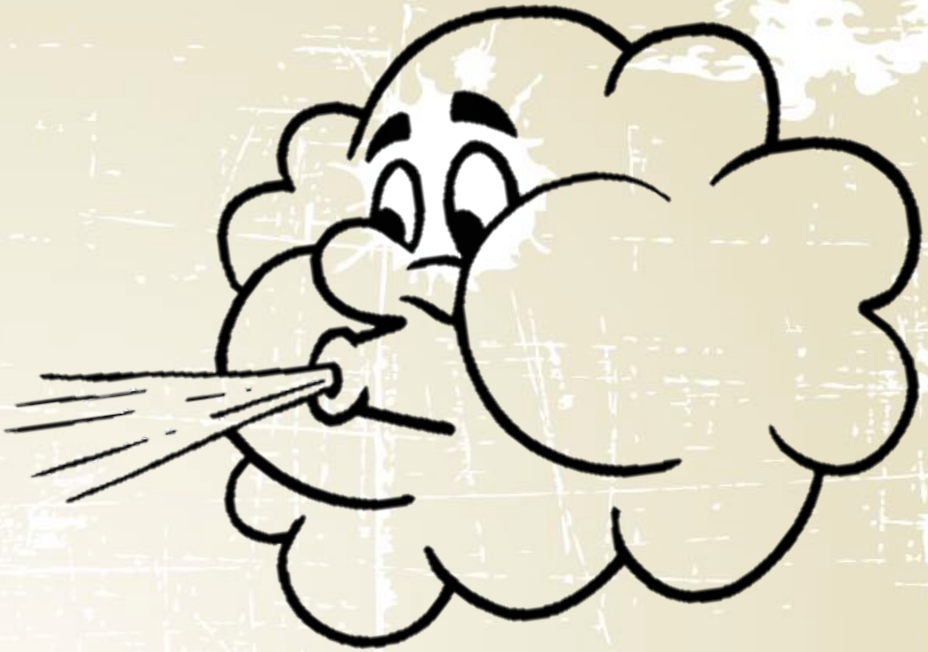
Slump

Rock Slide



Mud Slide

Erosion by Wind



When air moves, it picks up loose material and transports it to other places.

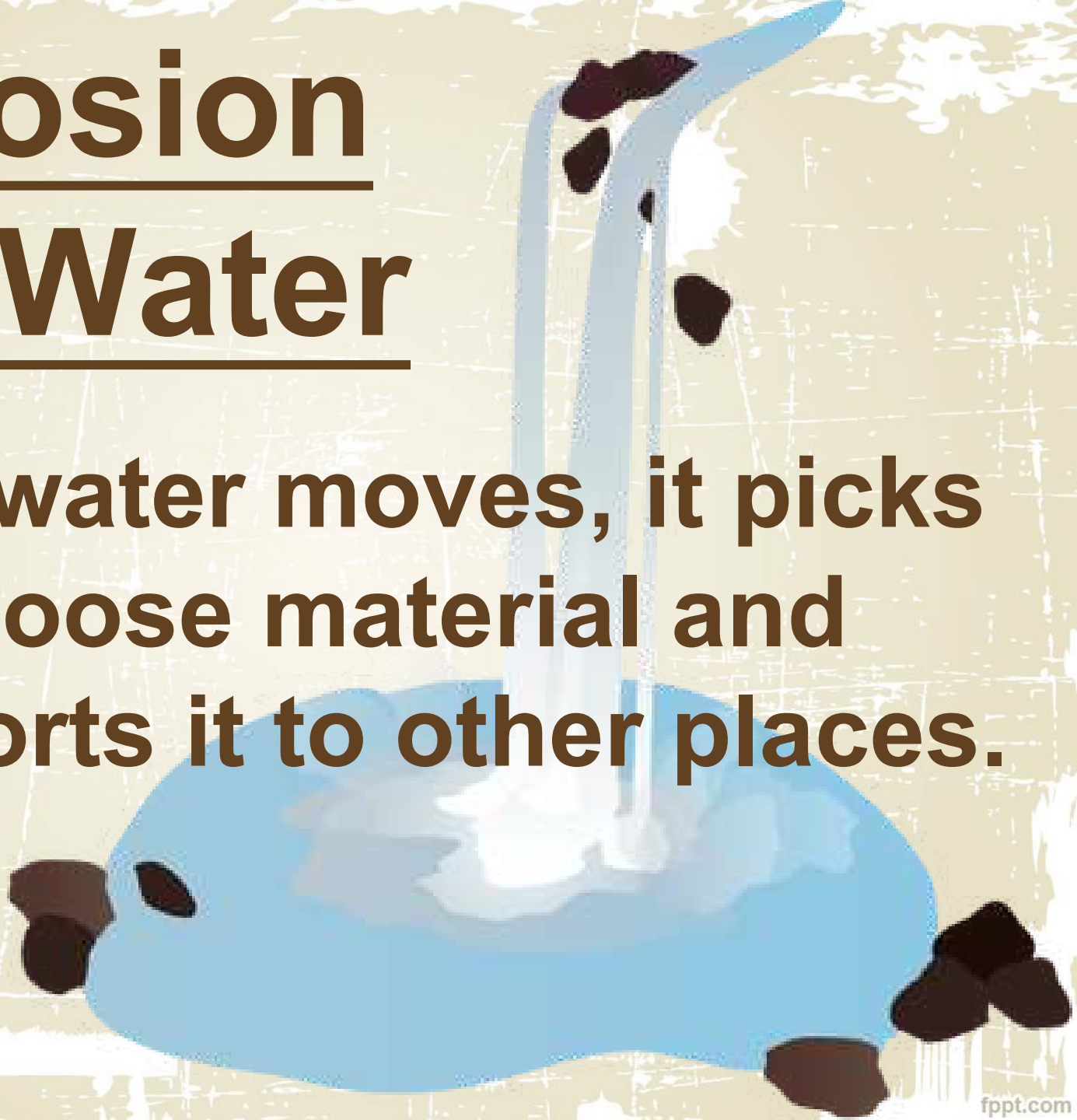
Erosion by Wind

Sandstorm

Dust Storm

Strong Winds

Erosion by Water



When water moves, it picks up loose material and transports it to other places.

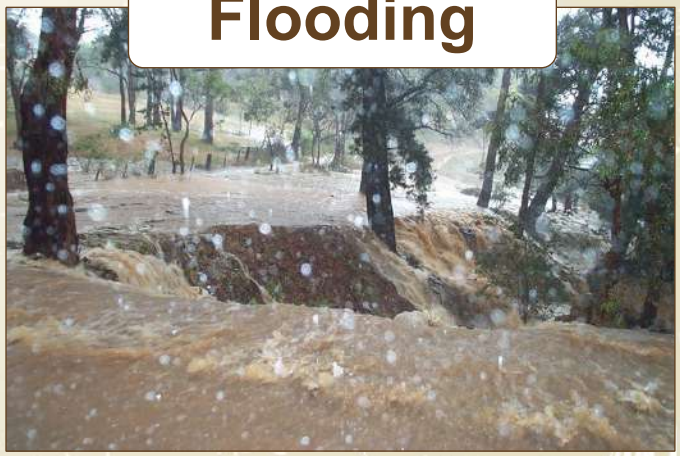
Erosion by Water

Rivers or Streams

Rain

Runoff

Flooding



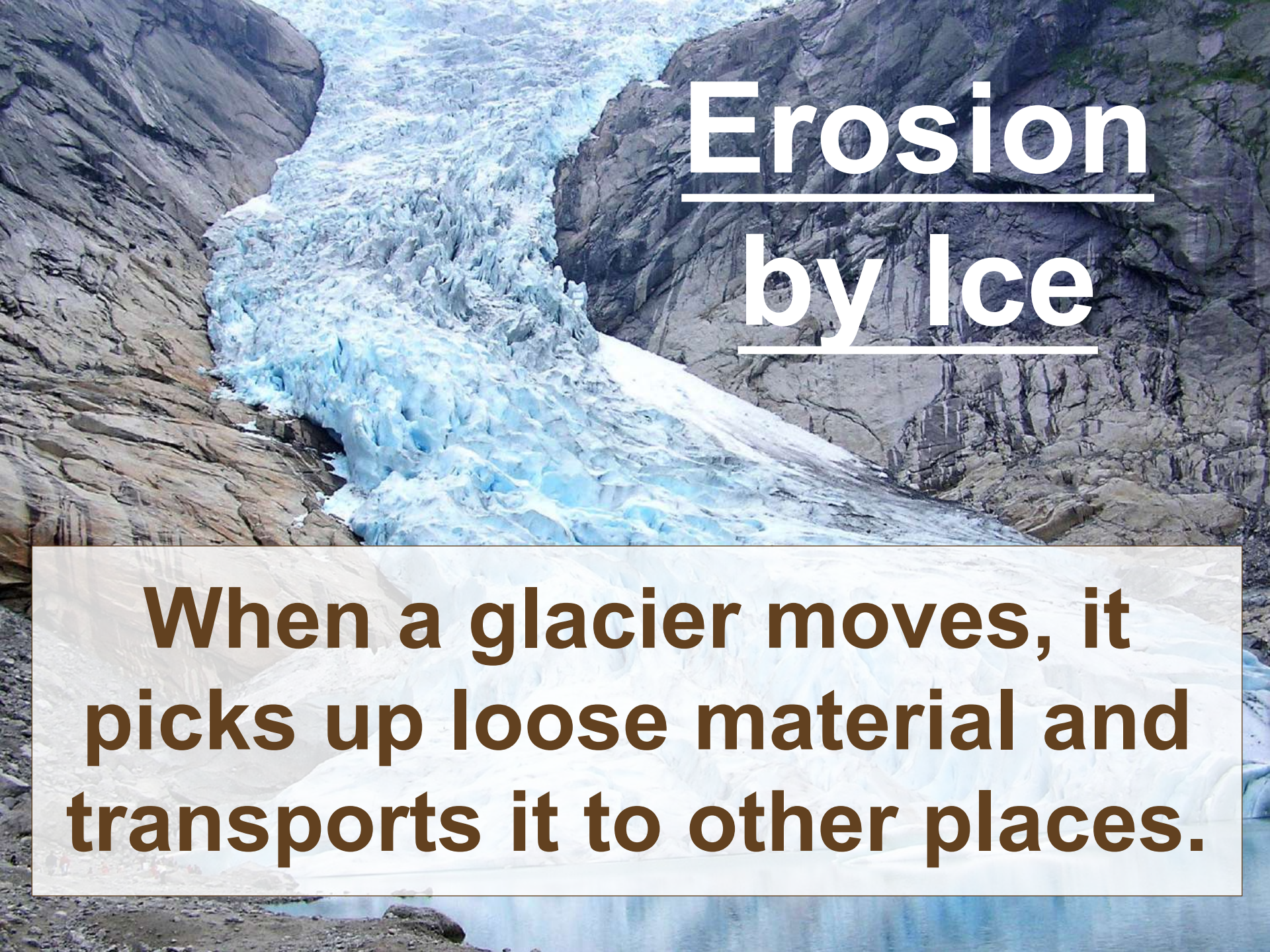
Erosion by Water

Waves eroding the shoreline

Images of Wave Erosion

Animations of Erosion by Water

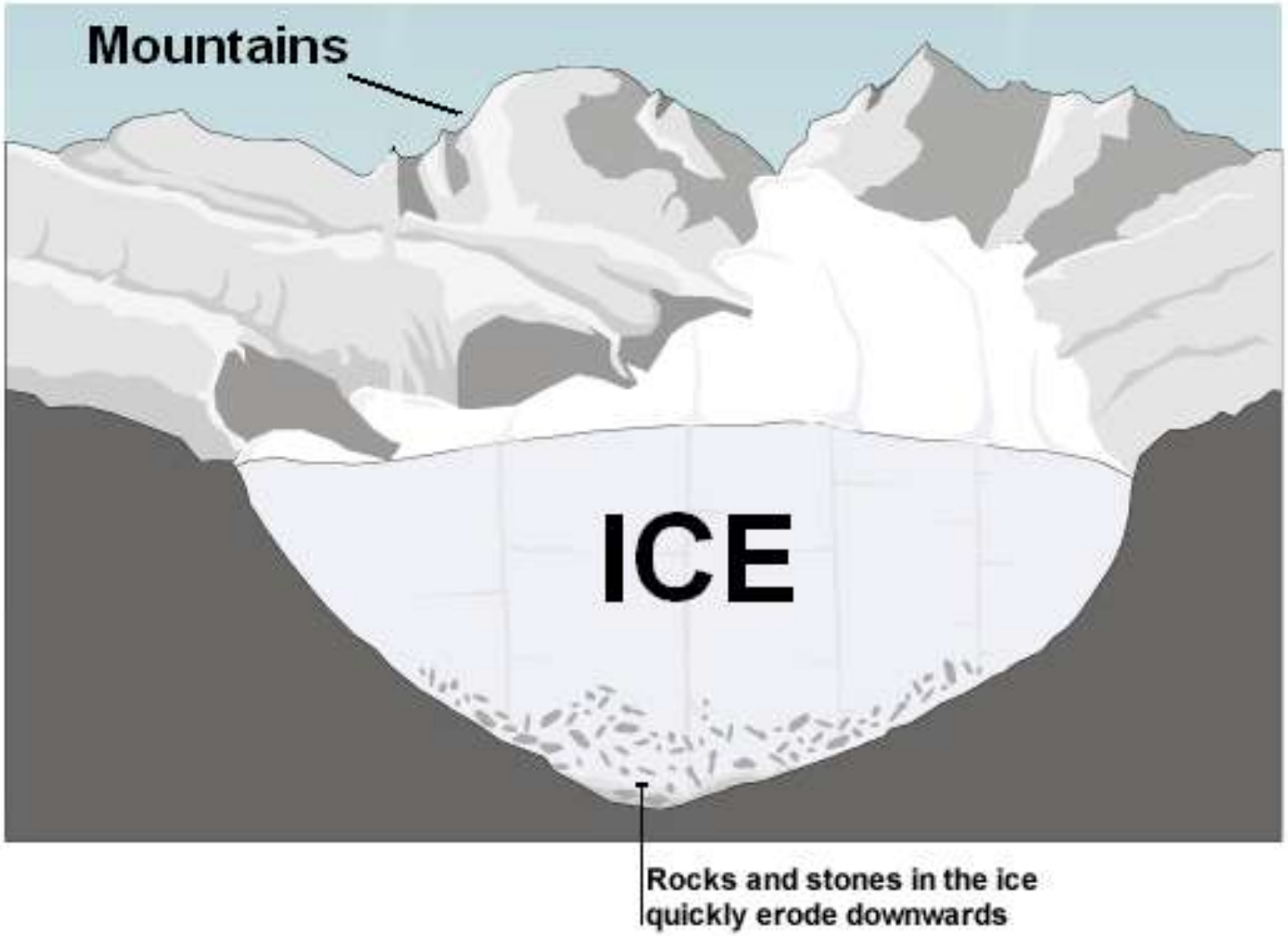
- Animation of sediments being transported
- Animation of erosion by a waterfall
- Animation of the formation of an arch



Erosion by Ice

When a glacier moves, it picks up loose material and transports it to other places.

Erosion by Ice

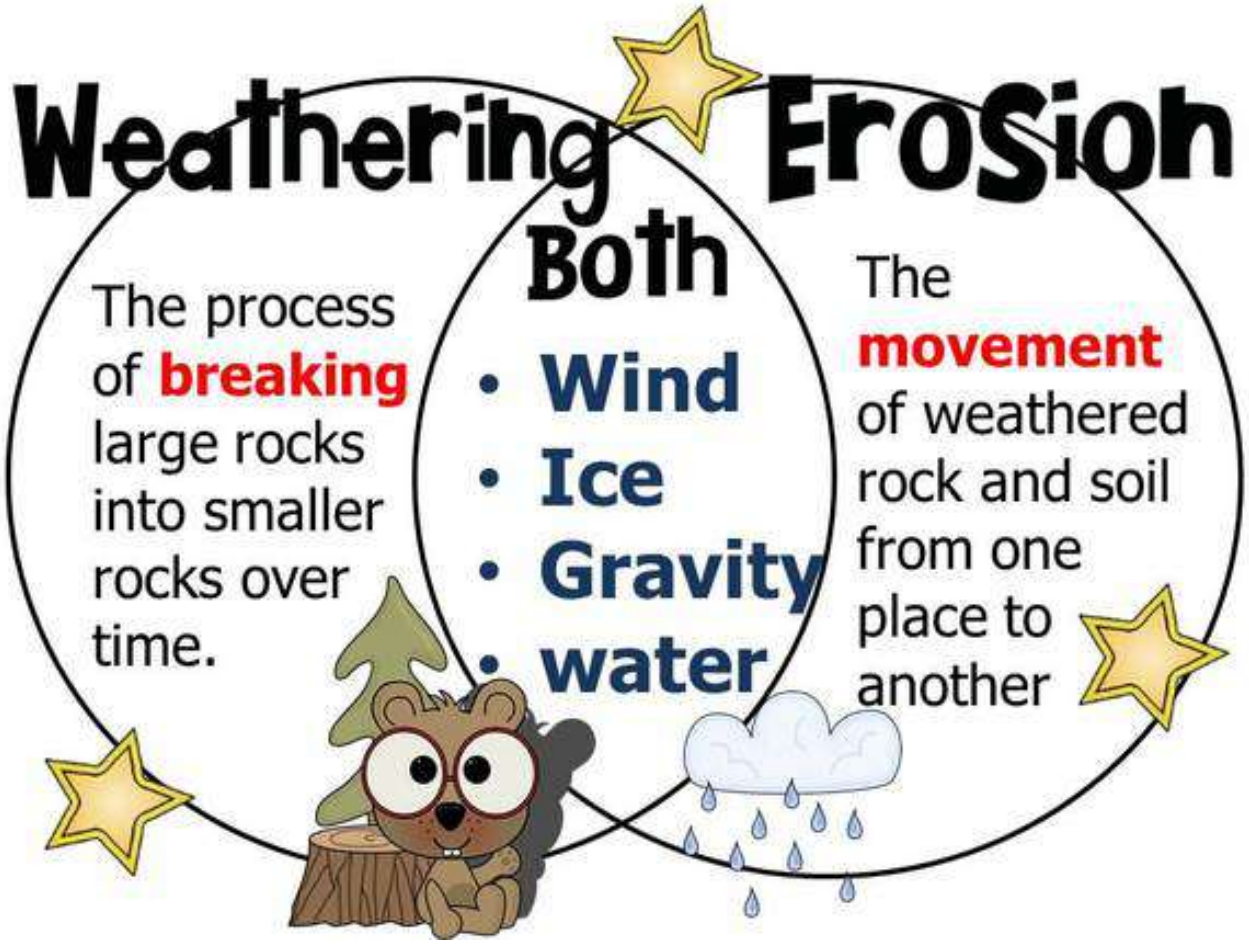


Images of how Glaciers erode rock

Turn to an elbow partner and describe examples of erosion you have observed.

With a different elbow partner, discuss the difference between Weathering and Erosion.

Weathering and Erosion are two very different processes that tend to act sequentially.



Weathering is the result of the physical and chemical changes of rock and mineral material; the resulting products might or might not be transported.

Additional Slides and Resources to Come