

Do Now!!!

- **Take a notes packet from trapezoid table.**
- **Start vocab on notes packet**

Chapter 2!!!

Weathering and Soil!!!

Section 2.1: Weathering!

Objectives:

- You will learn about weathering and its effects.
- You will learn to explain what mechanical weathering is and how it occurs.
- You will learn to explain what chemical weathering is and how it occurs.
- You will learn how climate affects weathering.



Surface processes that work to break down rock are called weathering.

- Weathering breaks rock into smaller and smaller pieces, such as clay, silt, and ~~sand~~. These smaller, loose pieces of rock are called ~~sediments~~.

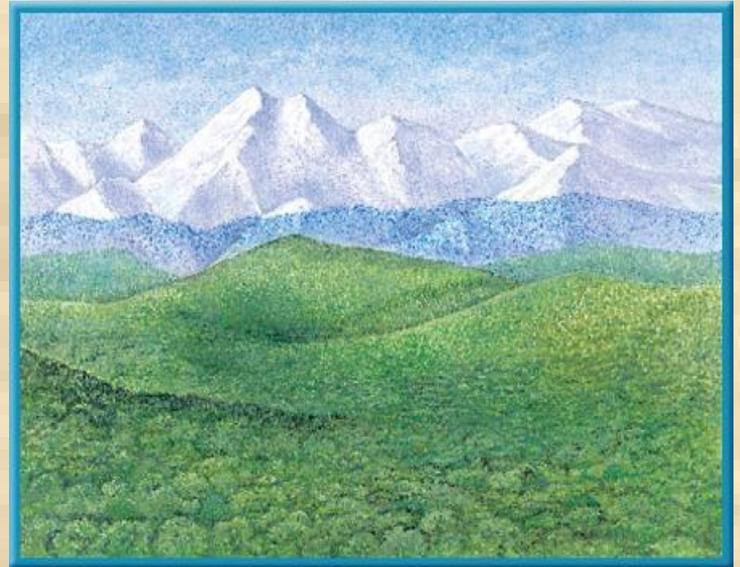
- The terms ~~clay~~, ~~silt~~, and ~~sand~~ are used to describe specific sizes of sediment.

- ~~sand~~ grains are largest
- ~~silt~~ grains are medium sized
- clay grains are smallest

- **Weathering** wears mountains down to hills
- Rocks at the top of mountains are broken down by weathering, and the sediment is moved downhill by ~~gravity~~, ~~water~~, ~~ice~~, and ~~wind~~.
- **2 types of weathering:**

~~mechanical~~

~~chemical~~



Mechanical weathering occurs when rocks are broken apart by physical processes. This means that the overall chemical makeup of the rock stays the same.

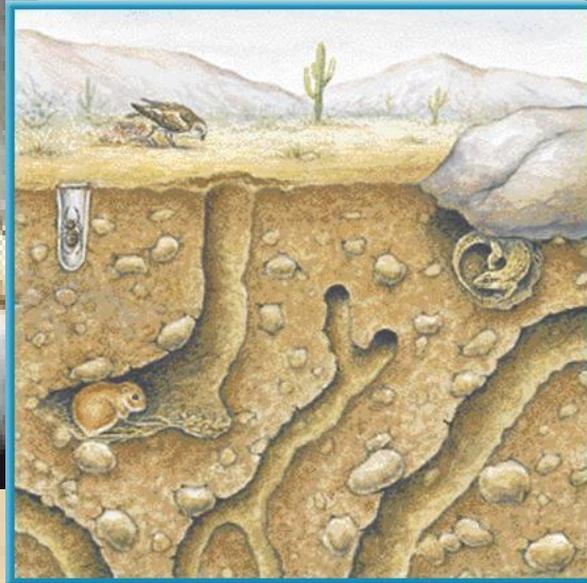


And it's ice in a cold December
But water when it becomes warm
And rocks broken they're expanding
And seeps in fissures and the holes that freezes on now



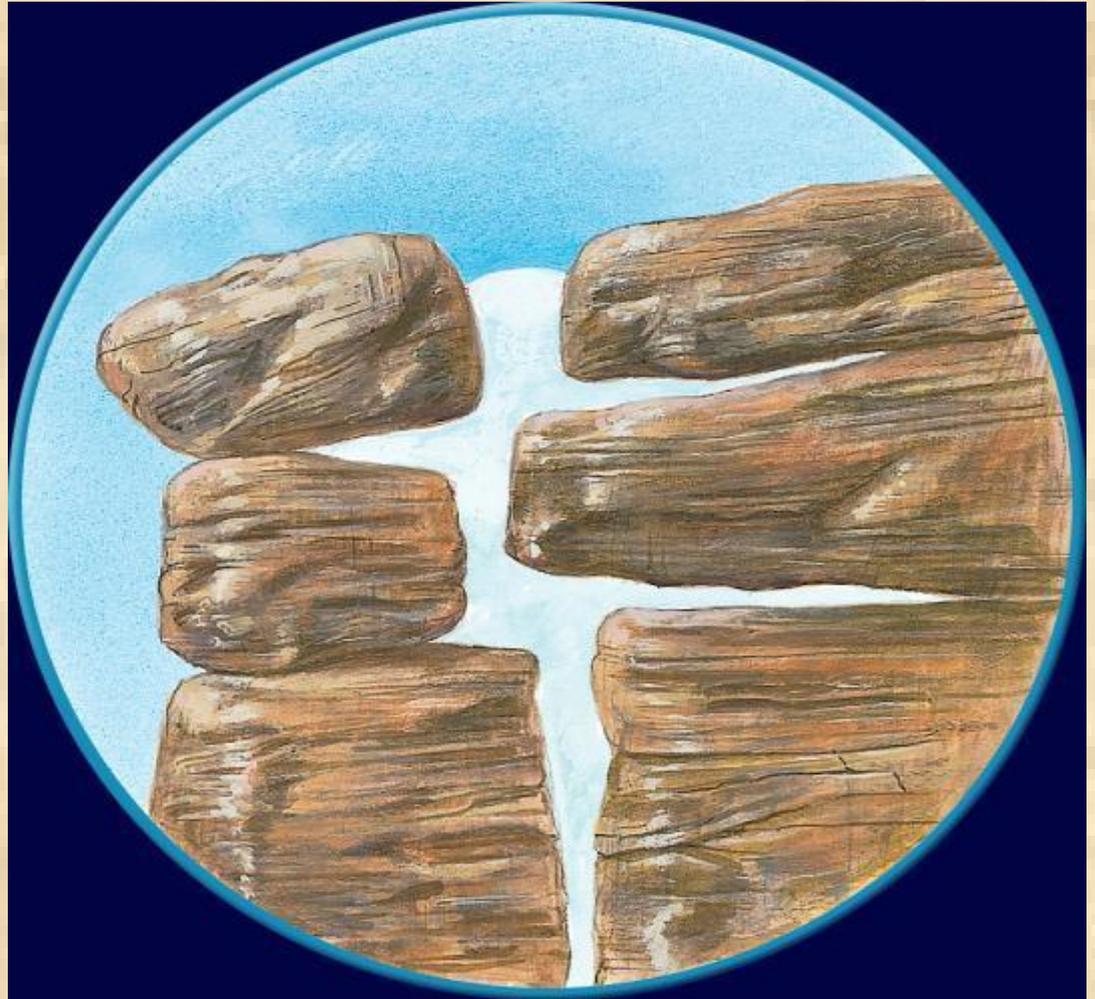
Examples

Growing plants, burrowing animals, and expanding ice are some of the things that can mechanically weather rock.





- **Ice wedging** occurs in temperate and cold climates where water enters cracks in rocks and freezes.



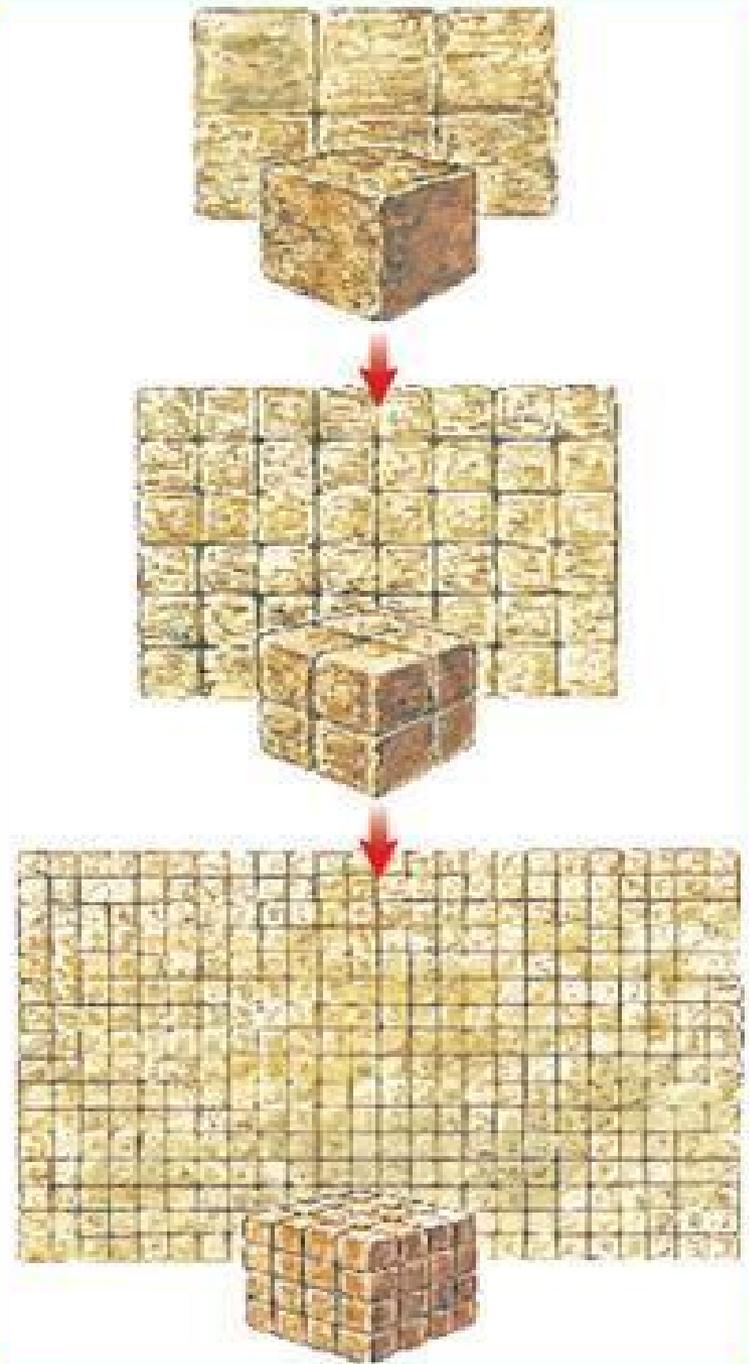
- This cycle of freezing and thawing not only breaks up rocks, but also can break up roads and highways.



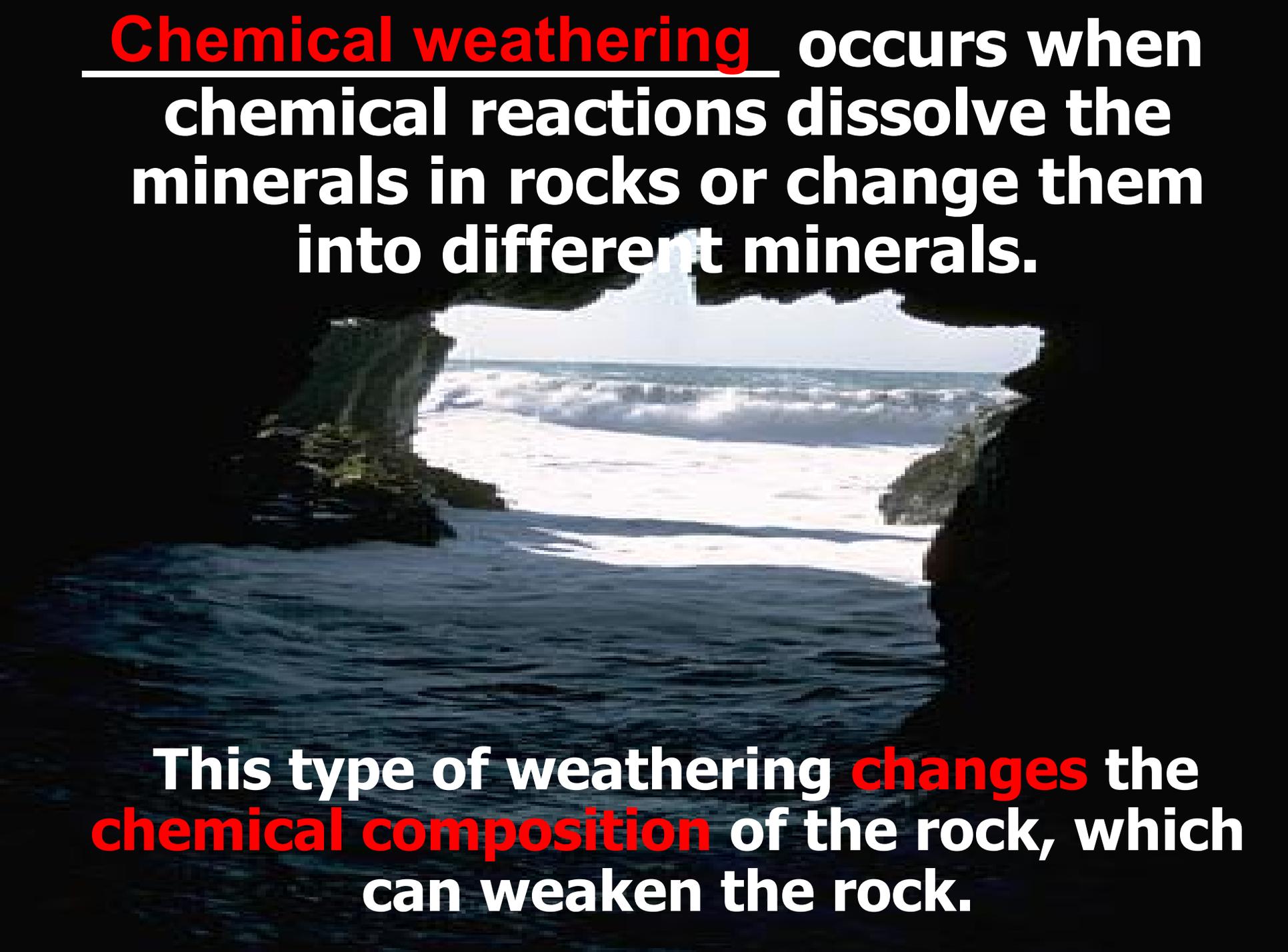
- When water enters cracks in road pavement and freezes, it forces the pavement apart. This causes potholes to form in roads.



- As rock is broken apart by mechanical weathering, the amount of rock surface exposed to ~~oxygen~~ and ~~water~~ increases.



Chemical weathering occurs when chemical reactions dissolve the minerals in rocks or change them into different minerals.

A photograph of a natural rock archway overlooking a beach and ocean. The archway is formed by dark, jagged rock formations on either side. The ocean is visible through the arch, with white waves crashing onto a sandy beach. The sky is bright and clear. The overall scene is a coastal landscape with a prominent natural rock formation.

This type of weathering **changes** the **chemical composition** of the rock, which can weaken the rock.

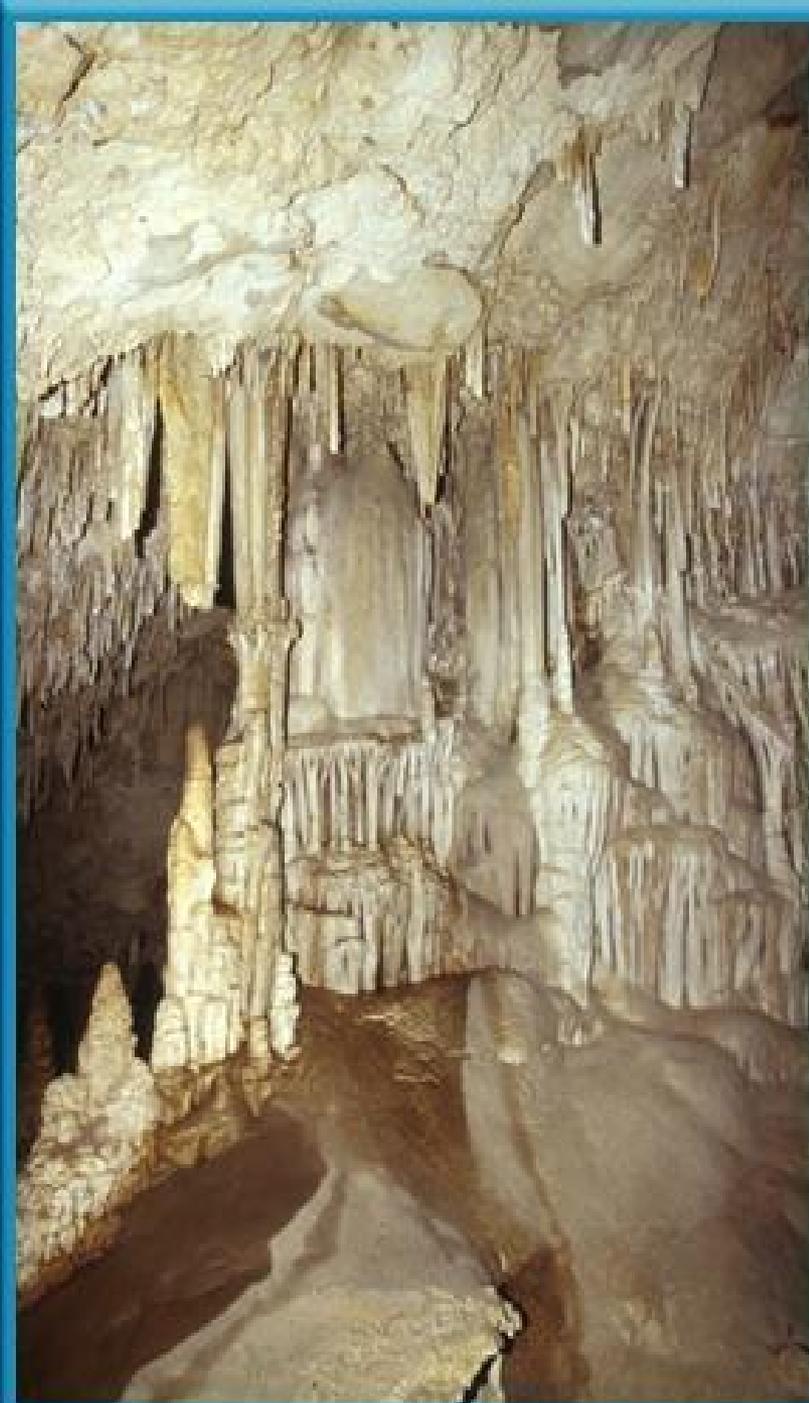


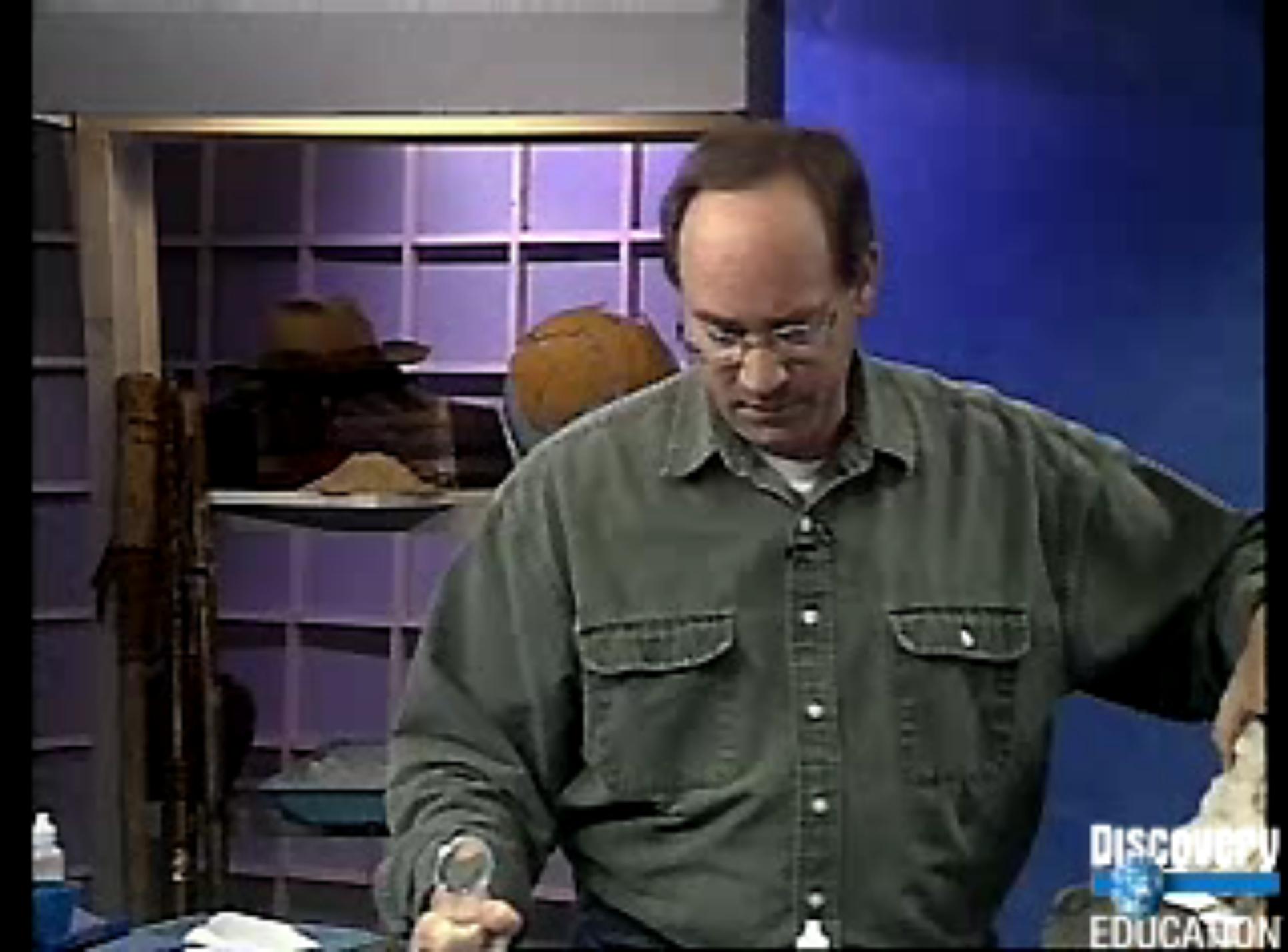
Discovery
EDUCATION

**Carbon dioxide + Water
= Carbonic acid**

**Carbonic acid reacts
with minerals such as
calcite, which is the
main mineral that
makes up limestone.**

**Over many thousands
of years, carbonic acid
has weathered so
much limestone that
caves have formed.**





DISCOVERY
EDUCATION

Do Now

- **Put lab in the plastic bin**
on the trapezoid table
by 1:21
- Take out 1-5
- What is mechanical weathering and what are 2 examples?

FELDSPAR



KAOLINITE



Chemical weathering also occurs when naturally formed acids come in contact with other rocks.

For example:
Feldspar + Natural acids = Kaolinite

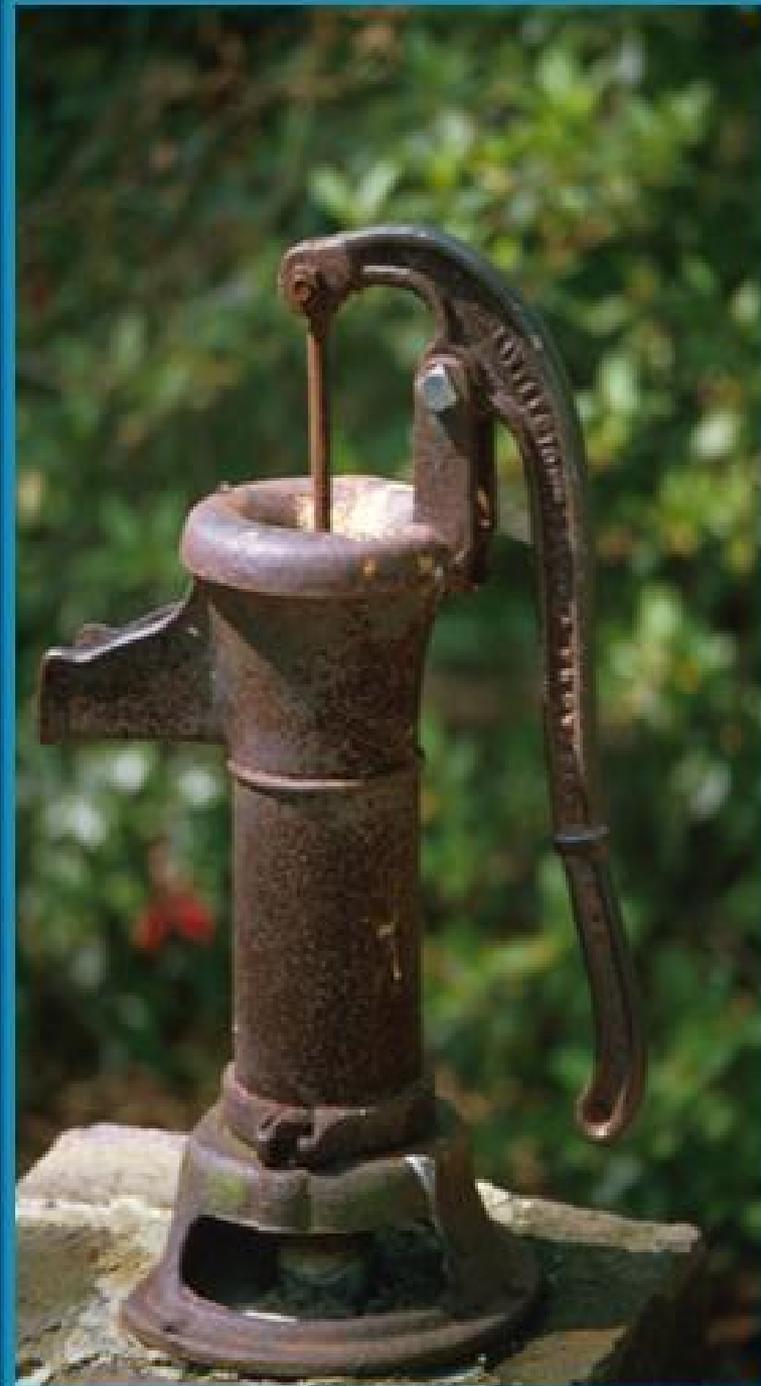
Some roots and decaying plants give off acids that also dissolve minerals in rock. When these minerals dissolve, the rock is weakened.

Eventually, the rock will break into smaller pieces.



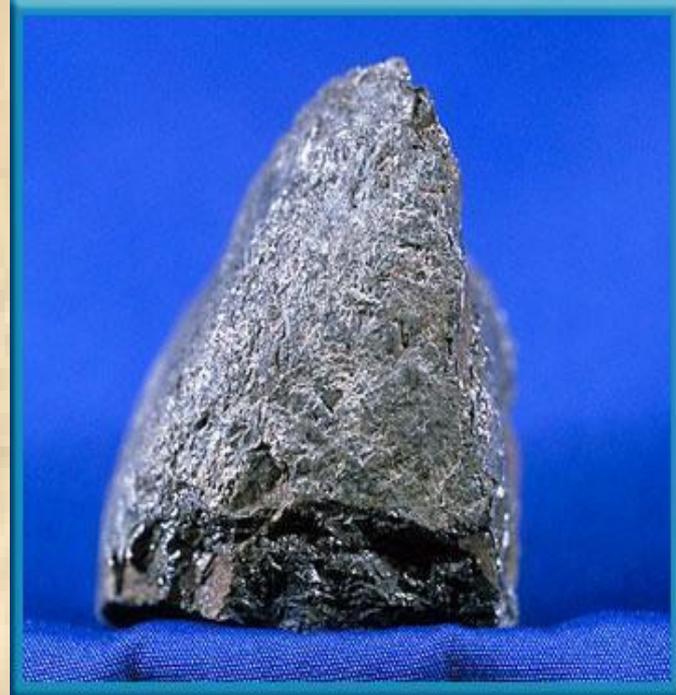
**Material + Water +
Oxygen =
Oxidation**

**Rust is caused by
~~oxidation~~ when the
material exposed to
water and oxygen
contains iron.**



One common example of this type of weathering is the alteration of the iron-bearing mineral magnetite to a rustlike material called limonite.

Oxidation of minerals gives some rock layers a red color.



Climate is the pattern of weather that occurs in a particular area over many years.

In **temperate** and **cold** climates, where freezing and thawing are frequent, **mechanical** weathering **rapidly** breaks down rock through the process of **ice wedging**.



Chemical weathering is more
rapid in **warm**, **wet** climates.



Lack of moisture in deserts and low temperatures in polar regions slow down chemical weathering.

Rock type also can affect the rate of weathering in a particular climate. **In wet climates, for example, marble weathers more rapidly than granite.**



Let's Review...

1. Weathering includes processes that break down rock.
2. Weathering affects Earth's landforms.
3. During mechanical weathering, rock is broken apart, but it's not changed chemically.
4. Plant roots, burrowing animals, and expanding ice all weather rock.
5. During chemical weathering, minerals in rock dissolve or change to other minerals.
6. Agents of chemical weathering include natural acids and oxygen.

