WEATHERING AND SOILS

What are processes that shape our Earth?
Weathering - the breakdown of rock at or near the Earth’s surface

Sediments - smaller pieces of rock that have undergone weathering
Weathering occurs when rocks are exposed to:

- Air
- Water
- Actions of Living Things
Chemical Weathering - the breakdown of rock through a change in mineral or chemical composition

- The rate of chemical weathering increases in warm and moist climates
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Before

After
Oxidation - when iron combines with oxygen to make rust
Effects of Water on Rock:

- Sometimes called the universal solvent, because given enough time water can dissolve nearly anything
- Water can combine with CO$_2$ to form carbonic acid
- Carbonic acid can dissolve most rock [e.g. limestone]
Sinkhole - a natural depression in a land surface formed by the collapse of a cavern roof
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Physical Weathering - the breakdown of rock into smaller pieces without chemical change
• Abrasion - occurs when rock particles grind against rock
  
• Characteristics: round shaped rocks
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- **Frost Action** - weathering process caused by cycles of freezing and thawing of water in rock openings
  - Water infiltrates cracks in the rock and when it freezes expands [approximately 10%] to split the rock apart
  - **Infiltration** - the process which water penetrates into soil or rock
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Frost Action

Potholes
- Plant Root Growth - as plants grow they can also spread cracks apart even farther
Abrupt Temperature Changes - as temperature increases rocks expand and fracture
Physical Weathering
Physical and chemical weathering processes are important in the formation of soil.

Soil is a mixture of weathered rock particles and organic matter that supports rooted plants.
• **Humus** - part of the soil that serves as a source of plant nutrients
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Soil Layers

- Topsoil
- Subsoil
- Partially Weathered Rock
- Unweathered Bedrock