Weathering and Erosion
Weathering

- The breakdown do the materials of Earth’s crust into smaller pieces.
Physical Weathering

• Process by which rocks are broken down into smaller pieces by external conditions.

• Types of Physical weathering
  – Frost heaving and Frost wedging
  – Plant roots
  – Friction and impact
  – Burrowing of animals
  – Temperature changes
Frost Wedging
Frost Heaving
Plant Roots
Friction and Repeated Impact
Burrowing of Animals
Temperature Changes
Chemical Weathering

• The process that breaks down rock through chemical changes.

• The agents of chemical weathering
  – Water
  – Oxygen
  – Carbon dioxide
  – Living organisms
  – Acid rain
Water

- Water weathers rock by dissolving it
Oxygen

- Iron combines with oxygen in the presence of water in a processes called oxidation.
- The product of oxidation is rust.
Carbon Dioxide

- $\text{CO}_2$ dissolves in rain water and creates carbonic acid
- Carbonic acid easily weathers limestone and marble
Living Organisms

- Lichens that grow on rocks produce weak acids that chemically weather rock
Acid Rain

- Compounds from burning coal, oil and gas react chemically with water forming acids.
- Acid rain causes very rapid chemical weathering.
Karst Topography

• A type of landscape in rainy regions where there is limestone near the surface, characterized by caves, sinkholes, and disappearing streams.

• Created by chemical weathering of limestone
Features of Karst: Sinkholes
Features of Karst: Caves
Features of Karst: Disappearing Streams
Erosion

• The process by which water, ice, wind or gravity moves fragments of rock and soil.
Water Erosion

• Rivers, streams, and runoff
Ice Erosion

• Glaciers
Wind Erosion
Mass Movements

- Landslides, mudslides, slump and creep