FOSSIL PRESERVATION

The chance that an organism will be preserved as a fossil is low. Geological processes such as erosion, weathering, sedimentation, and leaching constantly "attack" the fossil, which may destroy it before anyone sees it.

External Molds: Imprints of the organism embedded in rocks.
Casts: formed when external molds are filled with sediment.
Internal molds: Formed when sediment fills the shell of a deceased organism. These remain after the organism's shell decompose to show the internal features of the organism

There are two main types of fossil preservation, with alteration and without alteration. Most common is fossil preservation with alteration; the original organic material is partially to fully changed into new material.

There are several types of **preservation with alteration**:

carbonization, a chemical reaction where water transforms the organic material of plant or animal to a thin film of carbon. Nitrogen, hydrogen, and oxygen are driven off as gases, leaving an outline of the organism. Organisms often preserved by carbonization include fish, leaves and the woody tissues of plants.

permineralization or **petrifaction** takes place in porous materials such as bones, plants and shells. The material is buried; later, groundwater percolates through its pore spaces. A solution, commonly supersaturated in either calcium carbonate or silica, precipitates minerals in the spaces. The original wood or shell like material is preserved.

recrystallization changes the internal physical structure of a fossil. Recrystallization changes the microstructure of the original minerals; they often reform as larger crystals. The composition of the mineral does not change, only the crystal structure. For example, many shells originally composed of calcium carbonate in the form of the mineral aragonite recrystallize into the more stable form of calcium carbonate called calcite.

replacement involves the complete removal of original hard parts by solution and deposition of a new mineral in its place. The Petrified Forest in Arizona is an excellent example of this type of preservation. Here the original organic material (wood) has been wholly replaced by silica.

Trace fossils
Trace fossils are fossils that aren't actually part of the organism. These include footprints, burrows, eggshells, and even coprolite (or fossilized excrement).They indicate the presence of the organism and often give insight into an organism's behavior.

Actual remains
These are much rarer than other fossil types. These are still intact parts of the organism. Actual remains can be seen preserved in **ice**, **tar**, or **amber.** A good example is mammoth hair. It is often frozen and still preserved.