Fossils

- Fossils are preserved remains of living things

- Most are formed when living things die and are buried quickly by sediment before it's eaten, decomposed or weathered.

- The sediment will slowly harden into rock and keep the shape of the organism.

- **Paleontologist** are scientist that study fossils


Detailed fossil of a mioplosus swallowing a small fish.

- Fossils provide evidence of how life has changed over time.
- Fossils help scientists infer how Earth's surface has changed.
- Fossils are clues to what past environments were like.

Fossil ammonite

Detail of a fish fossil embedded in rock.

The Fossil Record and life

- The fossil record provides evidence about the history of life on Earth. The fossil record also shows that different groups of organisms have changed over time.
- Evolution is the gradual change in living things over long periods of time.
- Extinct is if an organism no longer exists and will never again live on Earth.

a. Petrification:

A once living material is replaced by minerals, turning it to stone.

- How does this happen?
  - Water rich in dissolved minerals seeped into spaces, evaporated, leaving the hardened minerals behind.
- Example – petrified wood

Petrified Wood

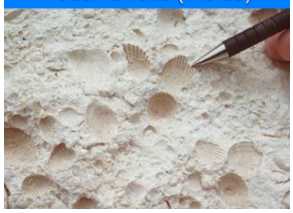
Petrified Log

The logs literally turned to stone as minerals replaced wood cells when trees were buried during an ancient flood

b. Molds and casts

- Most common type of fossil.
- Both copy the shape of the organism.
- A mold is a hollow area of sediment in the shape of the organism.
- A cast is a copy of the shape of an organism.
  minerals fill a mold or sediment washes into a mold and harden into a rock

Fossil Shells (molds)



Fossil trilobite (cast)

Fossil trilobite

c. imprints:

Fossil formed when a thin object leaves an impression in soft mud, which hardens.

Detail of a fossil fern embedded in rock.

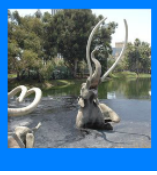
d. Preservation of entire organism

i) Freezing: Freezing preserves things because it prevents them from decaying.

Preserved Woolly Mammoth

ii) Amber: When the resin (sap) from certain evergreen trees hardens, it forms amber. Insects can be trapped.

iii) Tar pits: Large pools of tar. Sticky tar

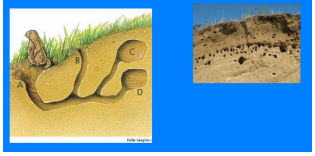


e. Trace fossils:

Non-body remains indicating the activities or behavior of an organism. Examples of trace fossils: tracks, trails, footprints, burrows, and fossil feces.

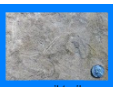
Fossilized dinosaur footprint

burrows



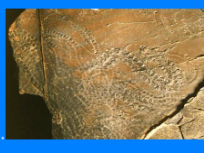
tracks

Trails



snail trail

- A **trail** is an impression made on a surface by the body of a limbless animal.



Coprolites

- Coprolites are fossilized feces

Group Activity:

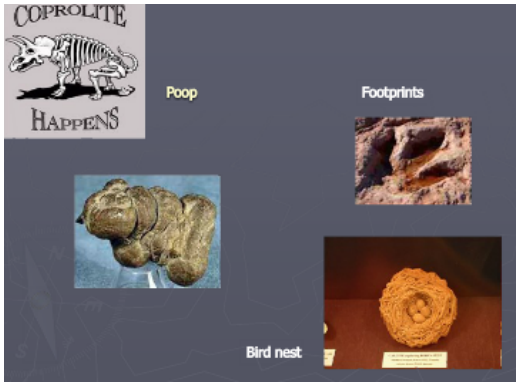
1. On a paper towel, flatten out a piece of clay.
2. Press the animals shape into the clay.
3. Remove the animal and put a thin layer of petroleum jelly in the space where the animal was (press lightly as to not destroy the patterns)
4. Get a test tube of melted wax from your teacher. Pour the wax into the depression in the clay. STOP POURING WHEN THE DEPRESSION IN THE CLAY IS FULL.
5. Allow the wax to harden while you begin the discussion questions.
6. **DRAW a PICTURE** of your model "fossil".

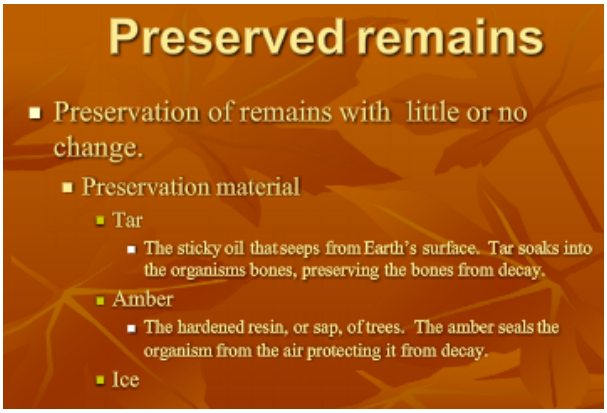
CarbonFilms

- Carbon film is an extremely thin coating of carbon on rock.
- How does this happen?
  - All organisms are made of carbon. When they are buried, the materials that make up the organism evaporates. These gases escape leaving carbon behind.

Trace Fossils

- Trace fossils provide evidence of the activities of ancient organisms.
  - Examples
    - A footprint provide clues about the size and behavior, the speed, how many legs it walked on, lived alone or with others.
    - A trail or burrow can give clues about the size and shape of the organism, where it lived, and how it obtained food.




Preserved remains
Preservation of remains with little or no change.
Preservation material
Tar
The sticky oil that seeps from Earth's surface. Tar soaks into the organisms bones, preserving the bones from decay.
Amber
The hardened resin, or sap, of trees. The amber seals the organism from the air protecting it from decay.
Ice