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Warm-Up | Fossils

Lesson Question

What can fossils reveal about Earth's history?

Lesson Goals

- **Explain** how fossils form.
- **Differentiate** types of fossils.
- **Explain** how fossils show Earth's changes over time.

Words to Know

Write the letter of the definition next to the matching word as you work through the lesson. You may use the glossary to help you.

D	petrified fossil	A. a fossil of an organism's activity, such as a footprint, a burrow, or scat
A	trace fossil	B. the extinction of a large number of species in a short amount of time
B	mass extinction	C. a scientist who studies fossils
C	paleontologist	D. an organism whose remains have been replaced over time by minerals
F	cast	E. a hollow fossil that marks the shape of an organism
G	carbon film	F. a fossil copy of the original organism
E	mold	G. a rock with a coating of only the carbon from an ancient organism's body

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Sedimentary Rock

Fossils usually form in sedimentary rock.

- Sedimentary rock is made of small particles of sand, rocks, and shells.
  - Sediment becomes compacted (pressed together) and cemented to form a rock.
- Examples include shale, sandstone, and breccia.

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Fossil Formation

A fossil is the preserved remains of a living thing.

- Fossils form when organisms are buried under [sediment].
- The sediment then hardens into rock and preserves the organism's [shape].

Making a Fossil

Fossils can form when sediments build up in still water over dead [animals] and [plants].



- Soft parts, such as skin and muscle tissue, decay.



- [Hard] parts remain, are protected from decay, and form fossils.

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Molds and Casts

Several types of fossils can be found in [sedimentary] rock.



Molds are hollow forms in sediment that mark the shape of an [organism].



Casts are the opposite of molds. Casts are [solid] copies of the original organism.

Petrified Fossils and Carbon Films

Petrified fossils and **carbon films** can [preserve] organisms.



Petrified fossils are the remains of [living] organisms that turn into [rock].



Carbon films are carbon [residues] from decayed organisms left behind on rocks.

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Trace Fossils

Trace fossils reveal activities of [ancient] organisms.

- Trace fossils include:
  - footprints.
  - [fecal] remains.
  - trails.
  - burrows.

Preserved Remains

Some fossils preserve an organism's [entire] body with little or no [change].

- Preserve soft [tissue]
- Include:
  - Amber (fossilized tree sap)
  - Tar pits
  - Ice and [permafrost]

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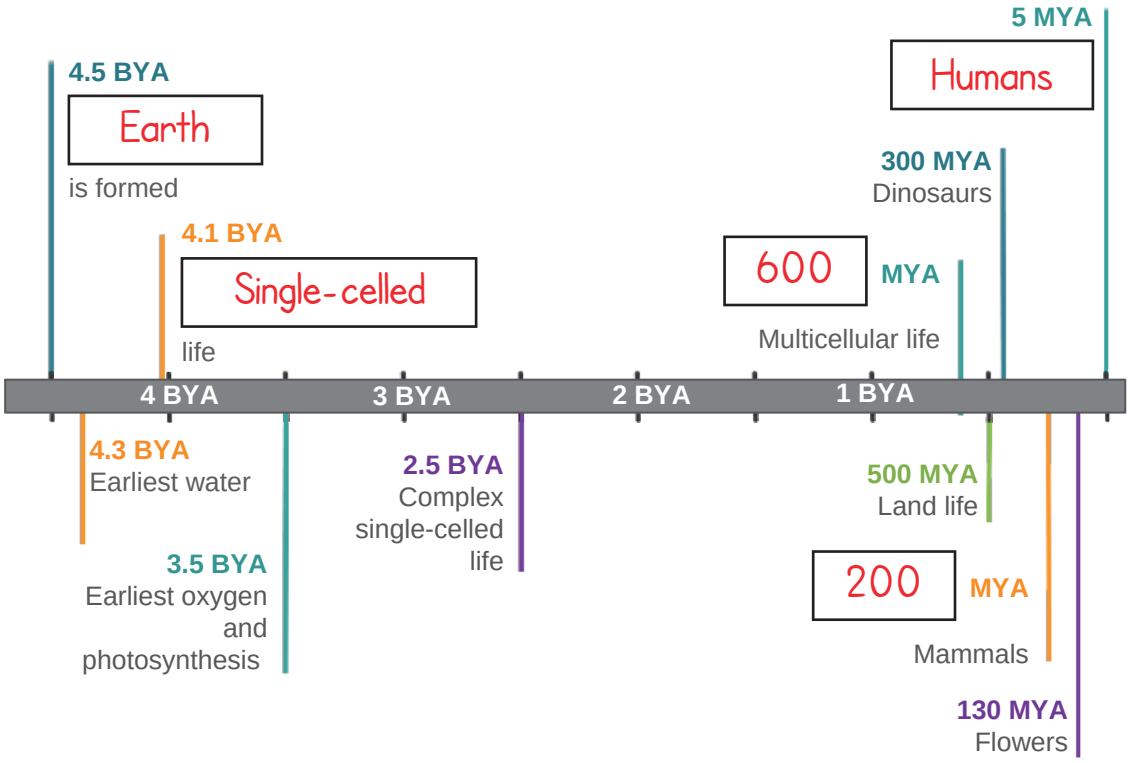
Paleontologists

Scientists who study fossils are called **paleontologists**.

- They study [fossils] from all over the world.
- They classify organisms:
  - by [similarities].
  - by time period.
- Paleontologists created the fossil record, which provides [evidence] about the history of life.

Evidence for Evolution



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Evidence of Change to Earth's Surface and Climate

Fossils provide evidence that Earth's surface and climate have changed.

- Scientists study tiny fossils in drilled core samples to:
  - determine water levels, temperature, and salt content.
  - analyze elements to learn about plants in the area.
  - understand changes in climate over time.

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Evidence of Plate Movement

The distribution of fossils provides evidence of past plate motion.

- The same species are found on these continents.
- This suggests that the continents were once joined.

Evidence of Extinct Organisms

The fossil record indicates that many organisms have become extinct.

- Fossils of countless extinct animals have been discovered.
  - Examples: dinosaurs, woolly mammoths, saber-toothed tigers, giant sloths, trilobites
- Fossils also indicate several instances of mass extinction.

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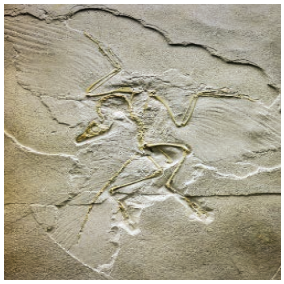
Evidence of Developmental Changes

Some fossils help us understand that [organisms] have changed over [time].



Compsognathus – short hairlike feathers



Archaeopteryx - long [asymmetrical] feathers



[Confuciusornis] – modern feathers and wings

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The Geology of Virginia

The landmass of Virginia includes [continental] crust, ocean crust, [mantle], volcanic material, [rocks] from seafloor spreading, and [sediment] from ancient seas.

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Summary | Fossils

Lesson Question

What can fossils reveal about Earth's history?

Answer

(Sample answer) Fossils provide clues about the conditions on Earth. Fossils can be fossilized remains of organisms that have been dead for a long time or trace fossils that provide evidence of the organisms' existence.

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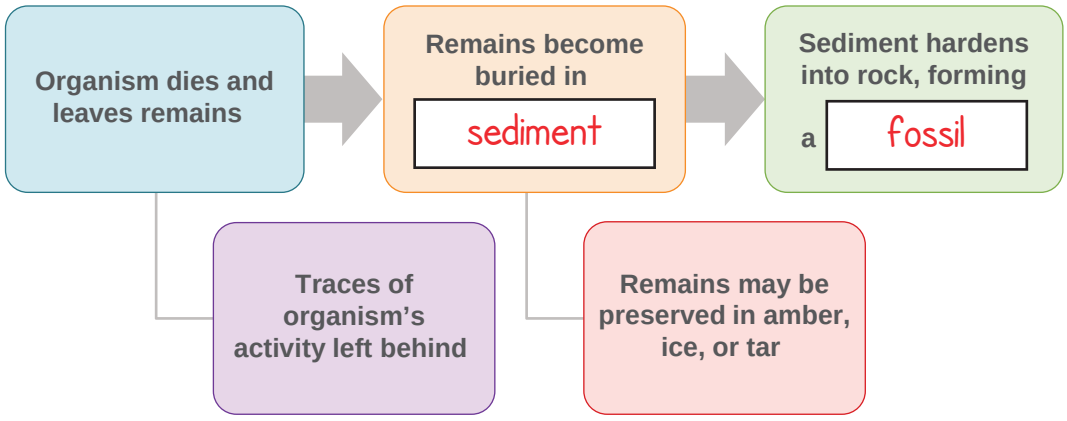
Review: Key Concepts

Fossil Formation



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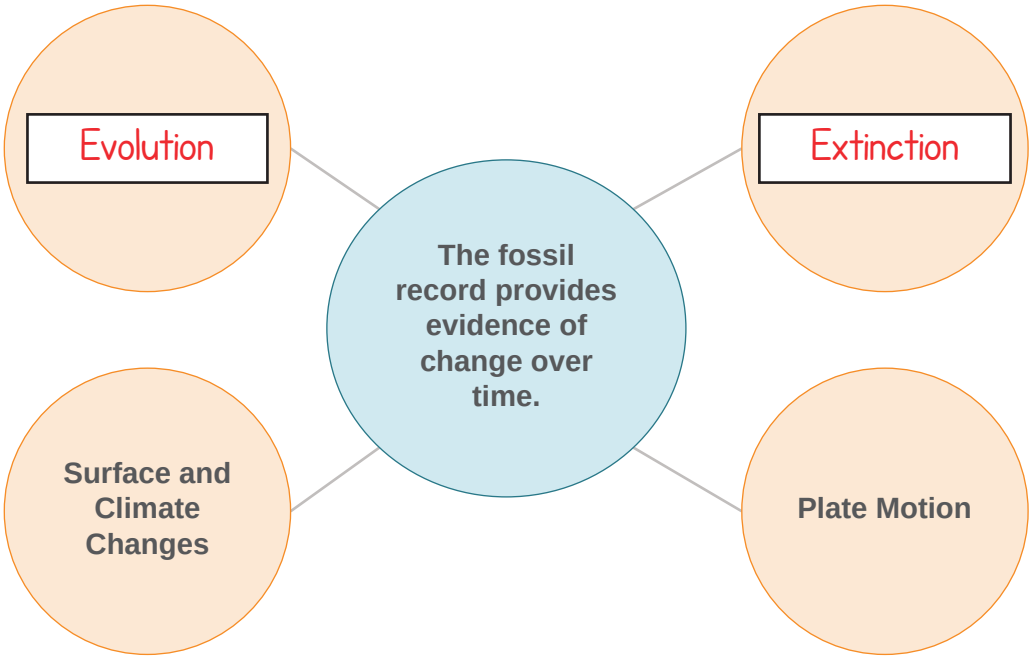
Review: Key Concepts



Use this space to write any questions or thoughts about this lesson.

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