



High Touch High Tech®

Science Experiences That Come To You

Dinosaur Eggs©

Supplies:

- Dinosaur Egg
- Pipette
- Popsicle Stick
- Dinosaur ID Card
- HTHT Bag

Instructions:

1. Place your dinosaur egg on a solid surface.
2. Using your pipette and a cup of water, draw water into your pipette. Now, slowly drip the water over your dinosaur egg.
 - a. To draw water into your pipette, squeeze the top, place it in the cup of water, and release your hold. The air inside the pipette is replaced with water!
3. Take your popsicle stick and slowly chisel away at the eggshell.
4. Repeat steps 2 & 3 until you break through to the middle of the egg.
 - a. What did you find inside of your egg?
 - b. Did you notice that there is also an imprint or fossil on the inside of your eggshell?
5. Repeat the steps above with the other eggs in your kit.
 - a. Are the dinosaurs the same?
 - b. Make observations and identify the differences between your dinosaurs.
 - c. How do the fossil imprints differ?



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The Science Behind It:

First let's talk about earth history!

The earth is approximately **4.54 billion years old**

- First there was a period of extreme volcanism – think, the earth covered in volcanoes and lava!
- Next the earth cools, crust solidifies, water accumulates. Now the Earth looks like a GIANT ocean!
- **3.5 billion years ago** – Earliest established evidence of life in the form of single-celled organisms
- **3.2-2.4 billion years ago** – Photosynthesis-based life adds oxygen to the atmosphere
- **580 million years ago** – Multicellular life exploded during the **Cambrian Explosion**
This is where we find trilobites!
 - Leading to land life, the rise of the dinosaurs, and then the rise of mammals & humans!
- **Dinosaurs** emerged during the late **Triassic period** about **243 and 233.23 million years ago** and continued to dominate the planet through the **Jurassic and Cretaceous period**.
 - Birds are descended from dinosaurs (**Pterosaurs** are ancient relatives of birds)! Giant versions of sharks, whales, crocodiles, and snakes also lived alongside dinosaurs and have living relatives today!
- The **Cretaceous-Paleogene extinction event** is what led to the extinction of the dinosaurs and many other species. It cleared the way for the mammals' rise to dominance.
- An asteroid struck the Earth around the Yucatan Peninsula and an ash cloud blocked out the sun. This wiped out plant life, which then wiped out herbivores, then carnivores in a massive chain reaction.
- **How do geologists know this?** The chemical signature of an asteroid is very different from rocks found here on earth. In the strata there is evidence of a distinct layer of ash. Below the ash there are Dinosaur fossils, above the line no dinosaurs. See how they piece that together to form a picture of what happened?

Next, let's learn about the earth's layers including **strata** and **stratigraphy**.

Strata is a layer of sedimentary rock or soil, or igneous rock that were formed at the Earth's surface, with internally consistent characteristics that distinguish it from other layers.

Stratigraphy is the science of deciphering the "layer-cake" that is the sedimentary record. Paleontologists rely on stratigraphy to date **fossils**.



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Rocks normally form relatively horizontal layers, with each layer younger than the one underneath it. If a fossil is found between two layers whose ages are known, the fossil's age is claimed to lie between the two known ages. Although not completely exact, the general age of fossils is easily estimated by examining what layer in the earth it is in and how it compares to fossils and other strata around the world.

Now let's learn about fossils.

“Fossils” – In Latin, it literally means obtained by digging.

- They are the preserved remains or traces of animals, plants, and other organisms from the remote past.
- The study of fossils across geological time, how they were formed, and the evolutionary relationships between different groups of organisms are some of the most important functions of the science of **paleontology**.
- Such a preserved specimen is called a "fossil" if it is **at least 10,000 years old**. Some are 3.48 billion years old!
- Fossils vary in size from microscopic, even single bacterial cells one micrometer in diameter, to gigantic, such as dinosaurs and trees many meters long and weighing many tons.
- A fossil normally preserves only a portion of the deceased organism, usually the bones and teeth of vertebrates, or the exoskeletons of invertebrates.
- Fossils may also consist of the marks left behind by the organism while it was alive, such as animal tracks. These types of fossil are called **trace fossils**, as opposed to body fossils.
- Can more than the bones be fossilized? Yes, if the creature is in a very cold environment (think woolly mammoth they discovered in ice), or anaerobic environment lacking oxygen (think swampy areas), or somewhere there is little bacterial activity or oxygen.