



Wyoming's Dino-mite Past!

Discovering Wyoming Dinosaurs

Overview

Students will use fossils to explore the dinosaurs that lived millions of years ago in Wyoming. Dinosaur environments, diets, and size will encourage understanding about these ancient beasts. Students will use photographs to identify certain types of dinosaurs, both extinct and alive today. They will also use clay impressions to explore the process of fossilization.

Grade

3rd – 5th Grade

Duration

One 45 – 50 minute lesson

Subject

Science

Language Arts

Fine Arts

Standards of Learning

Science

- SC4.1.3: Students show connections between living things, their basic needs, and the environments
- SC4.1.4: Students investigate water, air, rocks, and soils to compare basic properties of earth materials
- SC4.3.1: Students recognize the nature and history of science (Discuss how scientific ideas change over time; Describe contributions of scientists)
- SC8.1.4: Students investigate the interconnectedness of organisms, identifying similarity and diversity of organisms through a classification system of hierarchical relationships and structural homologies
- SC8.1.5: Students recognize behavior as a response of an organism to an internal or environmental stimulus and connect the characteristics and behaviors of an organism to biological adaptation
- SC8.1.9: Students systematize the Earth's history in terms of geologic evidence, comparing past and present Earth processes and identifying catastrophic events and fossil evidence
- SC8.3.1: Students recognize the nature and history of science

Language Arts

- SL.4.1: Students paraphrases information read aloud or presented in diverse media and formats.



- SL.4.2: Students identifies reasons and evidence a speaker provides to support particular points
- SL.4.5: Students differentiates between contexts which call for formal or informal discourse.
- SL.8.1: Students analyze the purpose of information presented in different media and formats, evaluate motives behind the presentation, and critique the reasoning and relevance of the speaker's argument and claims.

Fine Arts

- FPA 4.1.A.3: Students apply the elements and principles of design to their artwork
- FPA 4.1.A.5: Students use art materials and tools in a safe and responsible manner
- FPA 4.1.A.6: Students complete and exhibit their artwork
- FPA 8.1.A.3: Students analyze the use of the elements and principles of design in their artwork
- FPA 8.1.A.5: Students use art materials and tools in a safe and responsible manner
- FPA 8.1.A.6: Students complete and exhibit their artwork

Objectives

Students will be able to...

- Name 2-3 dinosaurs and what they ate
- Understand the size and general physiology of selected dinosaurs
- Explain basic fossilization
- Create a small fossil impression using clay

Materials

Included

- Dinosaur footprint cutout
- Artist renditions of dinosaurs
- Air-dry clay
- Objects for clay impressions (leaves, sticks, shells, etc)

Needed

- Plates/newspapers for clay activity

Key Terms

Adaptation - any alteration in the structure or function of an organism or any of its parts that results from natural selection and by which the organism becomes better fitted to survive and multiply in its environment.

Fossil - any remains, impression, or trace of a living thing of a former geologic age, as a skeleton, footprint, etc.

Fossilization - to convert into a fossil; replace organic with mineral substances in the remains of an organism.

Paleontologist - the science of the forms of life existing in former geologic periods, as represented by their fossils.



Sample Lesson Plan

1. Discuss dinosaurs using the artists' renditions – where they lived, what they ate, how they looked, etc. (Green River Basin, jungles, deserts, waterways, etc) Discuss dinosaur adaptations for each.
2. Explore the size of dinosaurs (both large and small) using the footprint cut out. *Optional:* have children remove their shoes and place them on top of the footprint. How many shoes does it take to fill up the footprint?
3. Talk about how if there are no longer dinosaurs that we can see, how do we know they existed? Introduce paleontologists and the concept of fossils and fossilization. Use dinosaur fossils as desired.
4. Show children that there are actually dinosaurs still living. (birds, sharks, caimans & crocodiles, bees, horseshoe crabs). Talk about how these animals were around during the dinosaurs. How did they survive this long?
5. Explain that they will be making their own fossil impressions using clay and objects. Allow children to make their own impressions and set aside to dry. Display as desired.

Fossil Facts

Enjoy these fun fossil facts for kids. Children will learn how fossils are formed, what the words paleontology and petrification mean, how we know so much about the dinosaurs and much more.

What are fossils and what is paleontology?

- Paleontology is the branch of biology that studies the forms of life that existed in former geologic periods, primarily by studying fossils.
- The only direct way we have of learning about dinosaurs is by studying fossils. Fossils are the remains of ancient animals and plants, the traces or impressions of living things from past geologic ages, or the traces of their activities. Fossils have been found on every continent on Earth.
- The word fossil comes from the Latin word *fossilis*, which means, "dug up". Most fossils are excavated from sedimentary rock layers (Sedimentary rock is rock that has formed from sediment, like sand, mud, and small pieces of rock).
- Over long periods of time, these small pieces of debris are compressed (squeezed) and are buried under more and more layers of sediment that piles up on top of it. Eventually, they are compressed into sedimentary rock.
- The fossil of a bone doesn't have any bone in it! A fossilized object has the same shape as the original object, but is chemically more like a rock.

How are fossils formed?

- Some animals were quickly buried after their death (by sinking in mud, being buried in a sandstorm, etc). Over time more and more sediment covered the remains. The parts of the animals that didn't rot (usually the harder parts like bones and teeth) were encased in the newly formed sediment. In the right circumstances (when there is no scavengers, quick burial, not much weathering) parts of the animal turned into fossils over time.
- After a long time the chemicals in the buried animals bodies underwent a series of changes. As the bone slowly decayed, water infused with minerals seeped into the bone and replaced the chemicals in the bone with rock-like minerals. The process of fossilization involves the dissolving and replacement of the original minerals in the object with other minerals (and or permineralization - the filling up of spaces in fossils with minerals, and /or recrystallization in which a mineral changes its form).
- In the end we get a heavy, rock-like copy of the original object - a fossil. The fossil has the same shape as the original object, but is chemically more like a rock!

Other ways fossils form: Petrification

- Petrification can preserve hard and soft parts and slowly replaces organic material with silica, calcite or pyrite, forming a rock-like fossil. Wood is often found petrified.
- Some organisms are embedded in Amber (a hardened form of tree sap). This usually preserved insects or pieces of plants.
- Fossils of imprints may form, like casts of dinosaur footprints. The impressions, in the right circumstances, fill with sediments that fossilize.
- Most animals did not fossilize, they simply decayed and were lost from the fossil record. Paleontologist's estimate that only a small percentage of the dinosaurs that ever lived have been or will be found as fossils.