



# Roaring Dinos!

## *Exploring the World of 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

Pre-K – 2<sup>nd</sup> Grade

### Duration

One 45 – 50 minute lesson

### Subjects

Science

Language Arts

Fine Arts

### Standards of Learning Met

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.)

Language Arts

- SL.4.1: Student paraphrases information read aloud or presented in diverse media and formats
- SL.4.2: Student identifies reason and evidence a speaker provides to support particular points
- SL.4.5: Student differentiates between contexts which call for formal or informal discourse

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



### 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

**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. Introduce dinosaurs as creatures who lived a long, long time ago (approx. 66 million yrs ago).
2. Discuss where dinosaurs lived (Green River Basin, jungles, deserts, waterways, etc) and what they ate (meat, plants, etc).
3. 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?
4. 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.
5. 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?
6. 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.

# 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.