

DICKINSON COUNTY NATURE CENTER

GRADE 4 — “FANTASTIC FOSSILS”

Core expectations

4-ESS1-1 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

Activity Time

One 45-minute session

Contact

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Program Alignment with Iowa Core Curriculum

Disciplinary Core Ideas

- **ESS1.C The History of Planet Earth:** Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed.

Investigative questions

- What are fossils?
- How can fossils provide evidence for how our landscape has changed?
- What does a paleontologist do?

Investigative phenomena

- The naturalist will begin by sharing that the Earth is 4.5 billion years old and showing students real fossils from millions of years ago.

Practices (SEPs)

- Students will work together to use information gathered from found fossils to construct a picture depicting what Iowa’s landscape looked like millions of years ago.
- Students will be asked to show evidence (fossils) that supports their explanation on why they think ancient Iowa had a landscape similar to their picture.

Cross Cutting Concepts students will identify

- Patterns in rock layers and fossils can be used as evidence to support an explanation of how Iowa’s landscape has changed over time.

Supplies

All supplies brought by the nature center unless otherwise arranged.

- Large geological timeline graphic
- 3 large bins with fossils, digging tools and sand
- 3 fossil identification sheets
- 3 large pieces of paper
- Markers, crayons or colored pencils
- Tape

Program Overview

Background

Cephalopods, crinoids and trilobites — these are just a few examples of the sea-dwelling creatures that called Iowa home more than 350 million years ago. Thanks to fossils found in earth layers, scientists are able to study these ancient creatures and learn more about what life and the environment in Iowa looked like millions of years ago.

Fossils are the preserved remains of ancient plants or animals. They are usually formed when the hard parts of an organism — such as shell, bone or teeth — are rapidly buried, usually by water sediment, and then mineralized over time. Types of fossils found in different rock formations allow scientists to map sequences of Earth’s history. Rock formations are usually stacked from oldest on the bottom, to youngest on the top. By studying these rock layers we can learn more about how the Earth’s landscape has undergone drastic changes over time.

Paleontologists are scientists who specialize in the study of the history of life. They examine data from fossilized bone, ancient pollen, and other items to discover details on past climates and the history of Earth.

Procedure

1. The naturalist will begin by asking students how old they are. Then the naturalist will write the number 4,500,000,000 on the board and explain that this is how old the Earth is. Isn’t it amazing how long the Earth has been here? However, the Earth hasn’t always looked like what we see today. Just as our appearances change as we get older, the Earth’s landscape has changed over time as well.
2. The naturalist will show examples of various fossils and briefly go over what fossils and paleontology are. The naturalist will then tape the large geological timeline on the board and explain how fossils and rocks in earth layers can be used to determine what prehistoric landscapes existed in an area.
3. Next, the naturalist will let students know that they are going to become paleontologists for the remainder of the activity. They will be divided into groups and need to work together to find fossils that will provide clues as to how Iowa’s landscape has changed over time.
4. The class will be divided into three even groups. Each group will be assigned a “dig site” that will represent one of the geological timeline eras — Paleozoic, Mesozoic or Cenozoic. They will dig for fossils and discover what life forms lived during that era. Each dig site will also have an identification area where students can match their fossil to a picture to learn more about their fossil and what Iowa may have looked like at that time.
5. Once the group has dug out all the fossils from their “dig site” bin, they will be given a large piece of paper to work as a group and draw what they think Iowa may have looked like during their era. Students will be encouraged to use their fossils to make guesses as to what the landscape looked like. For example, if they found a lot of sea-dwelling creature fossils, they know Iowa must have been under water.
6. When all the groups are done with their pictures, the naturalist will tape them on the board in the order of the geological timeline era. Each group will have a chance to share the fossils they found and explain to the class what they think Iowa must have looked like during their era.