

Paleontologist for a Day

LEVEL: Grades 4-8

STANDARDS: Fossils proved evidence about the plants and animals that lived long ago and the nature of the environment at that time
(Michigan E.ST.3)

Compare and contrast life forms found in fossils and organisms that exist today.
(Michigan E.ST.04.32)

OBJECTIVES:

- ✓ Learners will be about to describe what a paleontologist is/does
- ✓ Learners will be able to apply their understanding of symmetry in fossils

MATERIALS:

- Fossil kits (or access to online fossil photographs)
- Magnifying glasses
- Ruler
- Fossil handouts (see www.fossileducation.weebly.com , activities tab)
- Pencils

TIME CONSIDERATION:

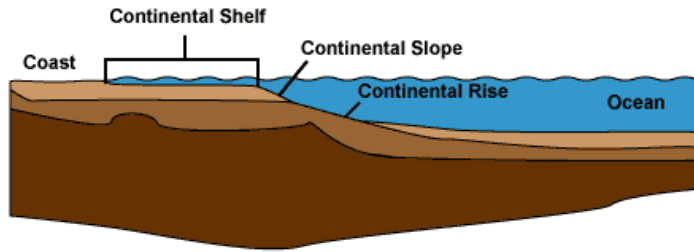
Prep time – 10 minutes

Lesson time – 45 – 60 minutes

BACKGROUND:

A Paleontologist is a scientist who studies fossils. They use fossils to better understand the history of the earth. Paleontologist may work outdoors where they will actually look for fossils. Some may work in a lab analyzing fossils. Paleontologists can find out how old fossils are and where and how they formed.

Invertebrates are animals that lack a backbone. Surprisingly, invertebrates make up nearly 97% of animals on Earth. This group includes organism such as spiders, worms, snails, centipedes, clams, mussels, jellyfish, squid, crabs, and many others. This activity looks specifically at marine invertebrate fossils. Marine simply means that these animals lived in a



saltwater environment. The continental shelf environment, the area beneath the water level just off of the coast of continents, has very abundant and diverse life. Throughout Earth history, these shelf sediments have become a very common sedimentary rock in the rock record. These two characteristics make it an excellent environment for the preservation of fossils.

One characteristic of fossils that is often used to identify different specimens is symmetry. Symmetry is a plane that divides an object into two equal halves. In fossils, four main types of symmetry are observed.

- None – these fossils have no planes that divide them equally
- Bilateral – a single plane of symmetry is present
- 5 fold - five dividing planes exist (star pattern)
- Radial – six or more planes divide the animal equally

Please refer to the fossil identification guide for examples of the different types of symmetry. Also explore the background information tab at www.fossileducation.weebly.com. Once the symmetry of the fossil is decided, further observations can be used to determine the fossil type.

PREPARATION:

Set up the classroom with a number of fossil observation stations. The number of students will determine how you structure this. There may be 2-3 fossils at one station or simply 1. Move the desks around so that the students will be spread out as they are doing their observations. Students will rotate through the stations; think about the flow of rotation as you set up the room.

*Consider doing this activity outside if it is nice. Paleontologist are always doing fieldwork outdoors, so why not get them in the right mindset.

INSTRUCTIONAL SEQUENCE:

Introduce the activity. Explain to the students that they are going to be paleontologists for the day. Make sure the student understand what a paleontologist is and does.

1. Briefly review the concept of fossils. Tell the students that they will be looking specifically at “marine invertebrate” fossils. Give some examples of modern marine invertebrates (see background information above) Help the students to break down the meaning of the term (marine = ocean, invertebrate= lacking a backbone).
2. Split the class into groups of 2-3 (this will depend on how many fossils stations there are). This will allow the students to collaborate their ideas as they are observing. Start each group at a fossil station.
3. Guide the students through their first station using the fossil identification booklet.
4. Let the students loose to discuss and make observations about the fossils. Encourage the students to initially write down a few observations before they go directly to the handout. Give each group 2-5 minutes at each station.
5. Come together as a group to go through all of the specimens together. Sit in a circle so everyone can see. Have each group bring the fossil from their last station to the group to share their observations. Use the set of identification cards for additional information about each of the fossils.

You may notice that there are 6 different species of brachiopods in the fossil kit. It is important to recognize the differences between them even though they are all brachiopods. You might have the class bring all of the brachiopods together and make some on the spot observations about their differences. Two things that you may point out or explain are:

1. The size and shape of the shell – Brachiopods adapted to the material they lived on. Their size and shape made them more suitable for their specific environment. Small brachiopods are better adapted to living on a rocky substrate. Those with a larger surface area were able to live on the ocean floor or even in a muddy substrate – think of a snowshoe and how the larger surface area helps you not to sink. Most modern day brachiopods have adapted to live in rocky areas.
2. The difference in the opening between the shells – Brachiopods, like clam can open and close their shells. Brachiopods are considered filter feeders, which means they bring in water and filter out the nutrients they need. It was of a greater advantage to have a larger opening to let more fluid in. Some of the shells have a simple concave opening and some have a fancier opening.

You may also note that 4 out of 6 of these species are extinct. Composita and Ryncotrema are still alive today, while the others are extinct.

CONCLUSION:

Have the students answer the 3 questions at the end of the worksheet.

Make sure the students recognize their accomplishments. Ask, "How are we like paleontologist?" Congratulate the kids on being paleontologist for the day! It would be beneficial to keep the fossil kit in the classroom for the remainder of the unit. Keep the cards nearby so the students can read and learn more as they have time.

ASSESSMENT:

The teacher will assess the students by reviewing their performance on the worksheet.

EVALUATION:

The teacher will know that learners know what a paleontologist is/does when students recognize what they have just accomplished through the discussion in the conclusion of the lesson.

The teacher will know that learners can apply their understanding of symmetry in fossils when he/she hears them present their last fossil and through their performance on their fossil worksheet.