

Teaching Activity: Ages Ago

Introduction: Fossils are the remains, or traces of organisms that lived long ago. A *fossil* can be a bone, a footprint, a shell, an entire body of an extinct animal or the imprint of a plant leaf. Most fossils are found in sedimentary rocks that were once under water. They begin to form when the organism was buried by sediment shortly after it died. The soft parts of the organism decay and only the hard parts, such as bones and shells are left. Over time, the sediments harden into rock and the organism is preserved or kept as a fossil in the sediment.

Fossils show that the Earth's surface and climate have changed over time. Fern fossils tell scientists that Antarctica was once very warm. Today, it is covered by ice and snow. Fossils of ocean animals have been found in the Andes Mountains of South America, more than 4000 m above sea level. Scientists can infer from this information that this land was once much lower than it is today and that it was at one time covered by an ocean.

Certain fossils, known as *index fossils*, can be used to help find the relative age of rock layers. To be an index fossil, an organism must have lived only during a short part of Earth's history and be found in rock layers over a wide area of the Earth in large numbers. Graptolites and trilobites are two index fossils that lived for millions of years. However, certain types of these organisms only lived for short periods of time. Scientists can date rock layers from different parts of the world by these short-lived species. If fossils of the same type or organisms are found in rock layers from two different parts of the world, scientists can infer that the layers are the same age.

Objectives:

- To understand that fossils are the remains of organisms that lived in the past and are used to reconstruct the history of life on earth;
- To make observations and inferences about a fossil organism;
- To use the process of scientific investigation to draw conclusions about the organisms;
- To practice active listening;

Materials: Fossil casts, metric rulers, hand lens, copy of geologic time scale, paper/pencil;

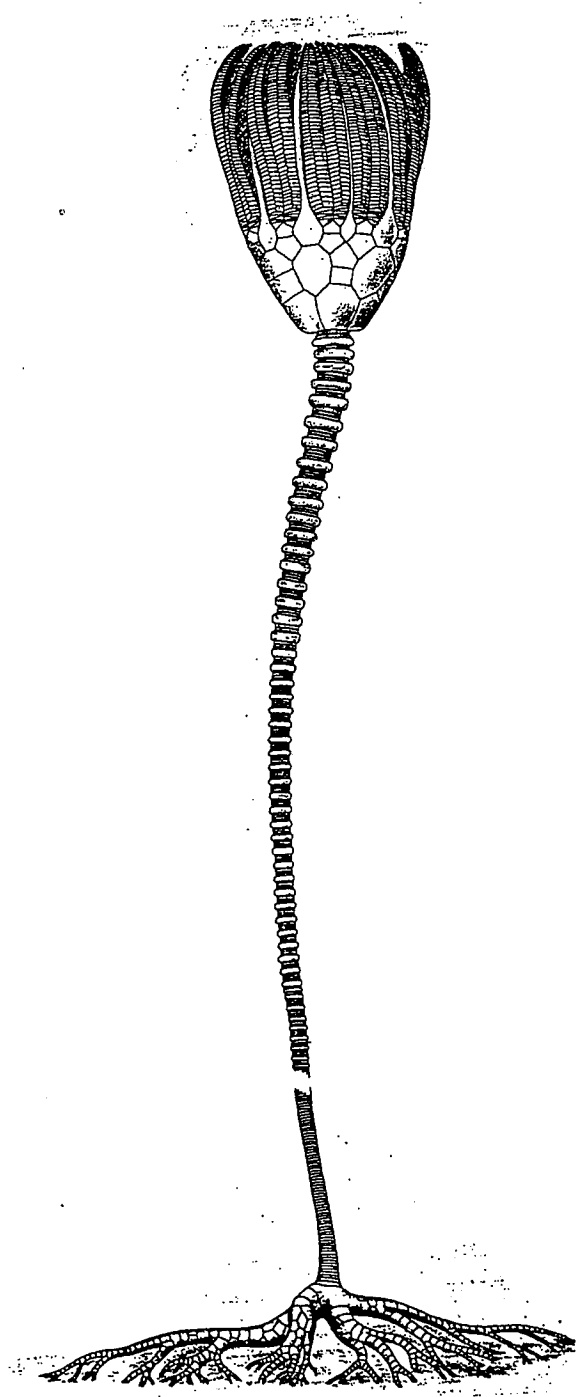
Procedure:

1. Pass out copies of the Geologic Time Scale and spend some time looking it over and discussing it with the class.
 - Direct some questions to the class regarding organization of the information and the appearance and types of species that are indicated at specific times.
2. Tell students that they will be looking at a fossil of an organism that lived at some point in Earth history and has relatives living today.

3. Pass out samples of fossils (or casts) to the students.
 - Direct their attention to the **Student Activity Sheet**, step #1. Read the instructions for this part of the activity and direct them to go ahead and complete the first task.
 - If necessary, review what an "observation" is.
4. Proceed to step #2. Read it over and direct students to follow the instructions exactly.
5. Move on to step #3. Students should be working with a partner and adding to their list of observations.
 - Additions to their drawings may be made at this point.
6. With a partner, students should then begin to answer the questions in the **Analysis and Conclusions** section.
7. When students have concluded the writing part of this activity, they should get together with another pair and try to agree on a set of answers to the questions.
 - Each group should be certain that everyone in their group can answer all of the questions.
 - Reconvene the class and ask for suggestions as to what they creature is and specifics about its environment, etc.
 - Show students the picture of the real organism and let them evaluate their answers and conclusions.
8. Each student should hand in their own copy of the **Student Activity Sheet** and answers to the questions.

NOTES:

This activity was written using plastic casts of a crinoid, a primitive echinoderm, much like modern day starfish and sand dollars. Feel free to choose another organism as the focal point of the activity or to use actual fossils of crinoid stems. A picture is attached.



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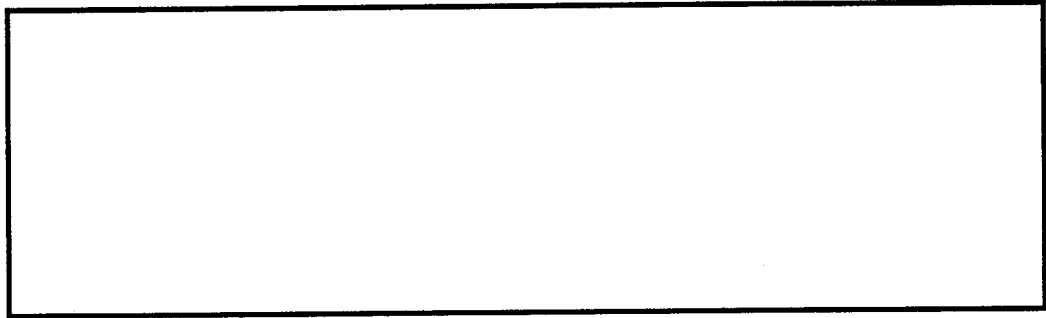
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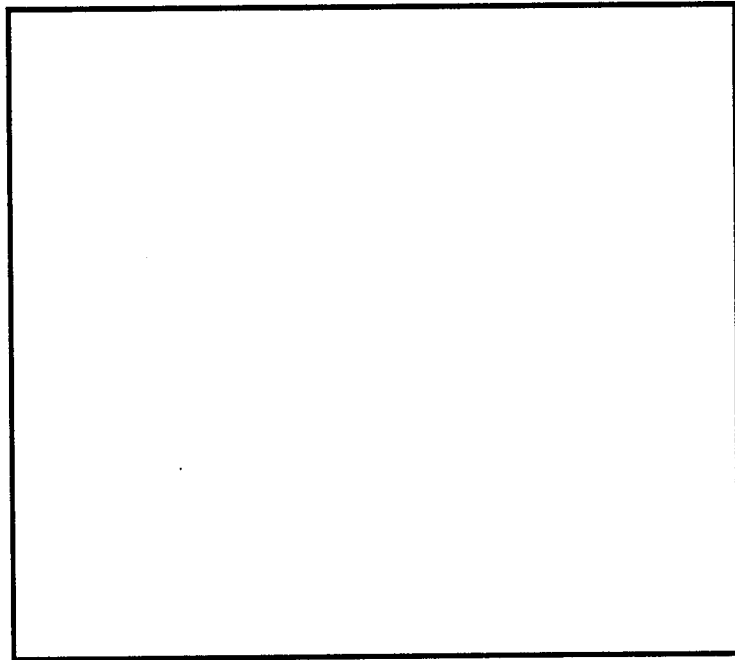
PART I: OBSERVATIONS

1. Look over and discuss the **Introduction** and the *Geologic Time Scale* with your teacher.
2. Without looking at the object in your hand, make a list of your observations in the space that follows. If you need more room, go to the back of the sheet.

Student Activity Sheet #2



2. After making your list of observations, refer to the *Geologic Time Scale* and use your imagination to draw a picture of what you think the organism looked like. (Remember that you are looking at a *piece* of an organism, not the whole creature. Is it plant or animal? Does it move? How? Where did it live? How did it get its food? Etc).



3. With your partner, compare your list of observations. Continue adding observations to your list as you examine the fossil more closely. **You may change or add to your drawing at this point only!**
4. With your partner, answer the questions in the **Analysis and Conclusions** section.

Student Activity Sheet #3

PART II: Analysis and Conclusions

1. What kind of organism is it, plant or animal? Why? _____

2. How long ago do you think that it lived on Earth? _____

3. In which geologic era do you think it lived? _____
In which period? _____

4. What kind of modern organisms might it be related to? _____

5. What type of material was its body made of? (skin, scales, cellulose, etc)

6. What part of the organism's body do you think the fossil belonged to? Why?

7. What do you think the environment was like in which it lived (land, freshwater, ocean, etc.)? _____

8. Draw a simple picture of the organism in its environment. Include other organisms that it may have shared its environment with.

