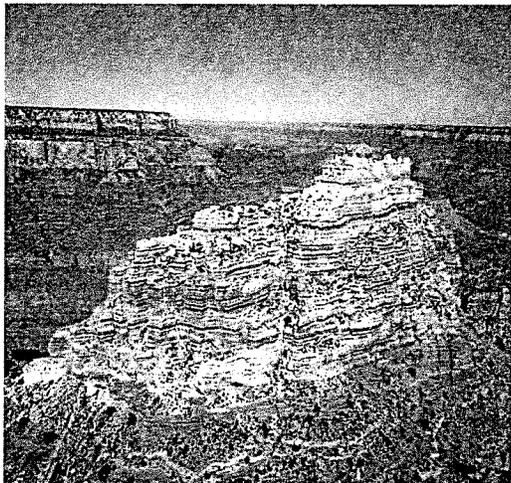
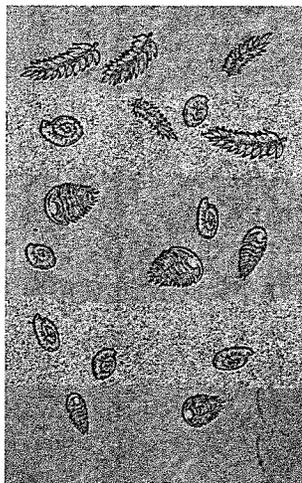


**LAB-AIDS® KIT #443S - CORRELATING SEDIMENTARY STRATA**  
**Student Worksheet and Guide**

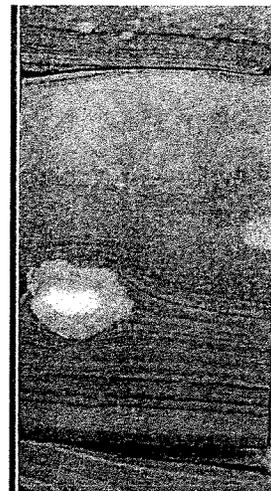
There are places on Earth—such as the walls of a deep river canyon—where hundreds of rock layers are visible, as seen in the photograph below. In nature, when a new rock layer forms, it is usually laid down on top of another layer that was laid down at some earlier time. This is called the **law of superposition**. Because of this, when you observe a series of rock layers, the top layer is younger than any other visible layer and the bottom layer is older than any other visible layer.



*Rock layers in the Grand Canyon*



*Stratigraphic column showing rock layers and fossils*



*Antarctic drill core*

A **stratigraphic column**, like the one shown above, is a diagram of a series of rock layers. Stratigraphic columns can be made by observing and measuring rock layers exposed on the sides of cliffs or in drill cores. A **drill core**, also shown above, is a cylindrical piece of rock removed from the Earth by a large drill, similar to the drills that are used to make oil wells. Drill cores can provide samples of rock layers from many miles beneath the surface of the Earth.

Many rock layers contain fossils. **Fossils** are the imprints or remains of ancient life. They are trapped in the rock layer that formed when the animal or plant died. The age of a fossil is roughly the same as the age of the rock layer in which it is embedded. No single location contains a complete set of all the rock layers or fossils that exist on Earth. **Paleontologists**, scientists who study ancient life, compare fossils, and the rocks surrounding them, from different places throughout the world. In this way they can determine the order in which rock layers were deposited and the relative ages of different types of animals and plants. In this activity, you will examine, analyze, and compare four different simulated drill cores, each from a different location.

**Challenge**

How can you determine which fossils are older, which are younger, and which are likely to be from extinct species?

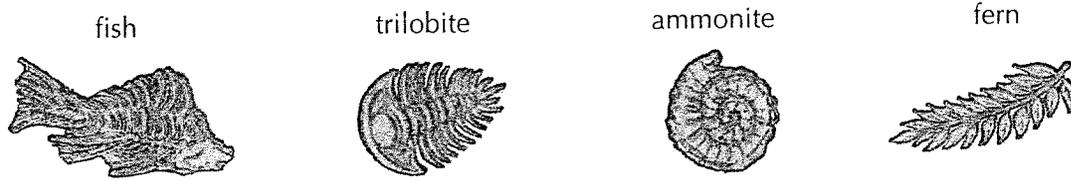
**Materials**

*For each team of students*

- 1 LAB-AIDS® simulated drill core
- 1 pair of scissors
- 1 metric ruler

**Procedure**

1. Examine your drill core. The top of each drill core is marked with its number.
2. Each layer represents a different type of rock. Shale is pinkish, with solid shading and sandstone is beige, with speckled shading. The fossils that are found in the layers are:



3. Create a stratigraphic column by sketching in the boundaries of the layers and the fossils found within each layer in the appropriate empty column on Student Sheet: Stratigraphy of the Drill Cores.
4. When directed by your teacher, exchange your drill core with a team that has a drill core with a different number.
5. Repeat Steps 1–4 until you have observed and sketched all four drill cores.
6. Cut out your four stratigraphic columns from Student Sheet: Stratigraphy of the the Drill Cores so that you can move them around as you try to match up the layers based on the appearance and the fossils found within each layer.

*Hint: Layers don't have to be exactly the same to correlate.*

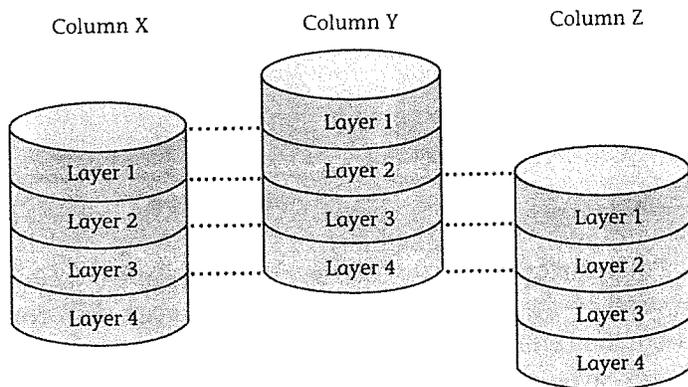


Figure 1: Sample Correlation of Stratigraphic Columns

7. Once you have matched up the layers from the four drill cores as best you can, redraw (or glue) the layers of each drill core onto Figure 2: Correlation of the Drill Cores so that the matching layers line up horizontally as they do in Figure 1 above.
8. Use your correlation chart to determine the relative age of the fossils then list the four fossils in order from youngest to oldest on the lines provided below.

Hint: If you think a layer found in one drill core is the same as a layer found in another drill core, you can infer that those layers, and the fossils in them, are the same age.

Youngest Fossil: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Oldest Fossil: \_\_\_\_\_

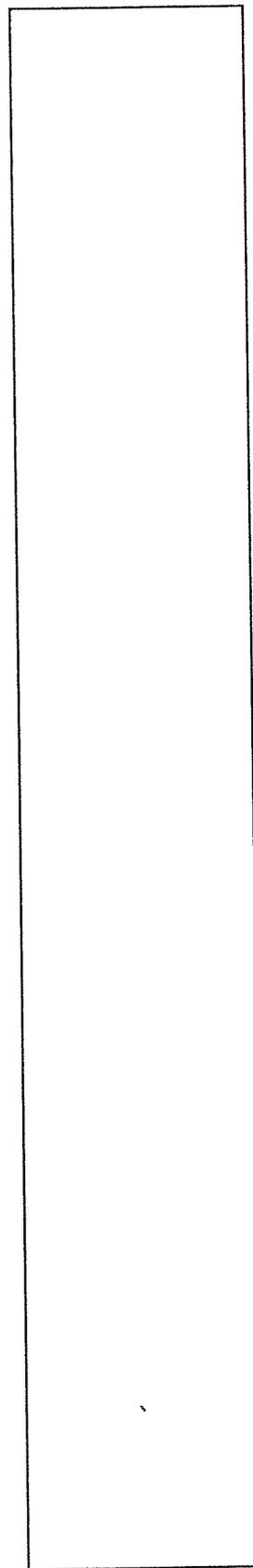
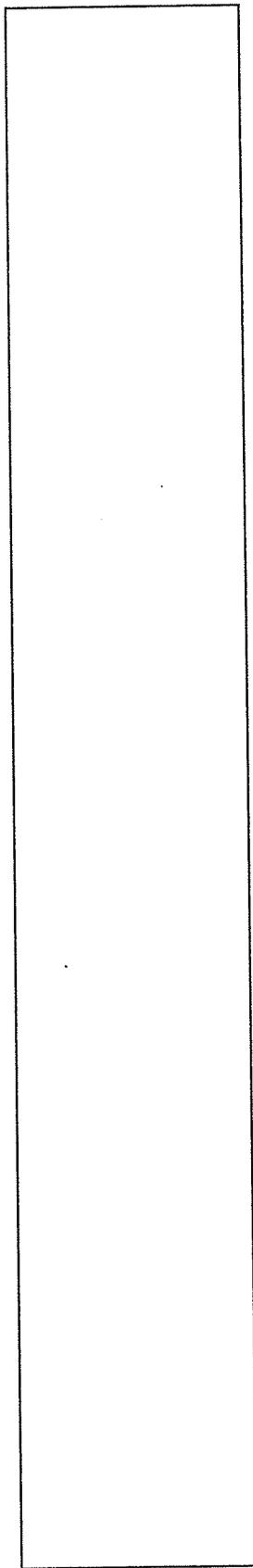
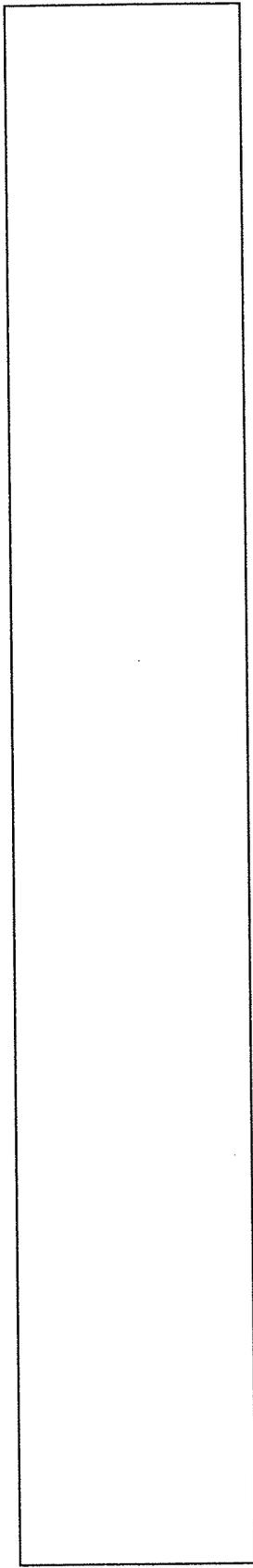
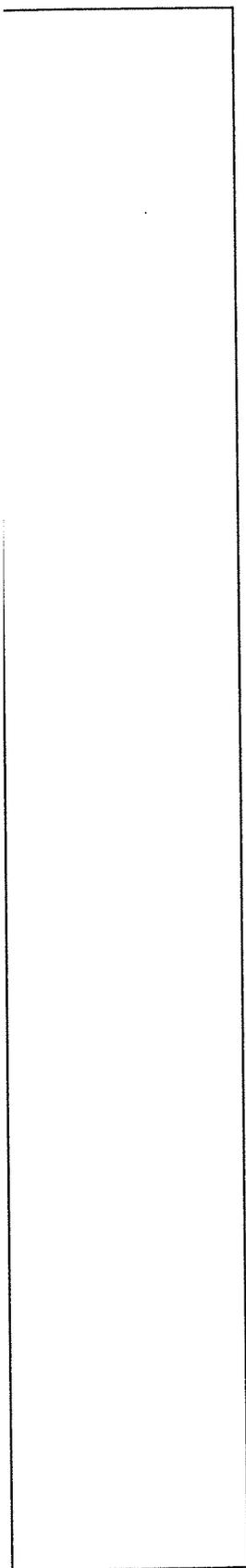
Figure 2: Correlation of the Drill Cores

Core #1

Core #2

Core #3

Core #4



## Analysis

- Describe some of the difficulties you had trying to match evidence found in one drill core with evidence found in other drill cores. What additional evidence would have helped you make your correlations?

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- Based on evidence from all four drill cores, which, if any, of the organisms represented by the fossils may be from species now extinct? Explain.

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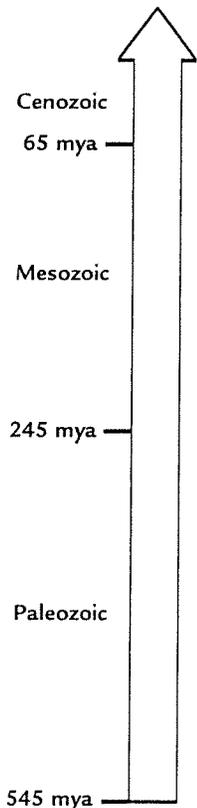
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- Which fossil species could have lived at the same time?

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- Using the information in the chart on the right and the list you made in Step 8 of the Procedure, determine the geologic era(s) when each species is believed to have been alive and place the fossil names in the appropriate places on the timeline below. Explain how you determined your answer and whether it is based on inference, observation, or a combination of both.

Core	Layer	Geologic Era
4	1	Early Cenozoic
1	2	Early Mesozoic
3	5	Middle Paleozoic
2	5	Early Paleozoic




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