

**Skills Practice Lab**

# History in the Rocks

Geologists have discovered much about the geologic history of Earth by studying the arrangement of fossils in rock layers, as well as by studying the arrangement of the rock layers themselves. Fossils provide clues about the environment in which the organism that formed the fossil existed. Scientists can determine the age of the rocks in which fossils occur because the ages of many fossils have been determined by radiometric dating of associated igneous rocks. Radiometric dating, fossil age, and rock arrangement are all used to determine changes that have occurred in the arrangement of the rock layers through geologic time. In this lab, you will discover how the geologic history of an area can be determined by examining the arrangement of fossils and rock layers.

## OBJECTIVES

Apply the law of superposition to sample rock columns.

Demonstrate the use of index fossils in determining relative and absolute ages.

Evaluate the usefulness of different methods used for determining relative and absolute age.

## MATERIALS

- paper
- pencil

## PROCEDURE

1. Study the index fossils shown in **Figure A**. Note their placement in related groups and the geologic periods in which they lived.
2. Select one of the four fossil arrangements shown in **Figure B**. This figure shows how some of these fossils may occur in a series of rock layers. Record the number of the arrangement you are using.

3. Using **Figure A**, identify all the fossils in your arrangement and the geologic time in which the organisms that formed the fossils lived.

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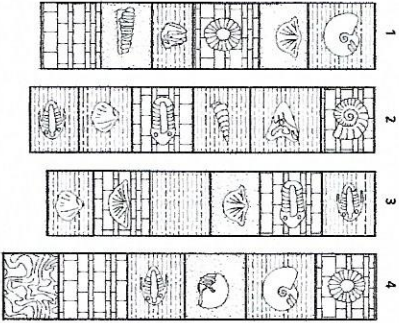
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# History in the Rocks *continued*

**FIGURE A**

Geologic period	Name of Animal Group				
	Brachiopoda	Echinodermata	Mollusca	Arthropoda	Chordata
Cretaceous					
Jurassic					
Triassic					
Permian					
Permian					
Mississippian					
Devonian					
Silurian					
Ordovician					

**FIGURE B**



4. List the fossil names in order from bottom to top.

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5. Do the fossils in your arrangement appear in the order of geologic time?

6. Do the fossils in your arrangement show a complete sequence of geologic periods? If not, which periods are missing?

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**History in the Rocks *continued***

**ANALYSIS AND CONCLUSION**

- 1. Analyzing Processes** What processes or events might explain the order in which each of the fossil arrangements was found?

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- 2. Evaluating Assumptions** Based on your observations in the procedure, why is it necessary that a fossil be found in a wide variety of geographic areas to be considered an index fossil?

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- 3. Explaining Events** Study arrangement 3 in **Figure B**. Note that there is a rock layer that contains no fossils between two rock layers that contain fossils. How might this have occurred?

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**EXTENSION**

- 1. Examining Data** Collect fossils in your area. Identify the fossils you have collected, and describe what your area was like when the organisms existed.

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- 2. Research** Find out how index fossils are used to help petroleum geologists locate oil reservoirs. Then, use that information to give an oral report to your class.

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