

NAME _____ DATE _____

INSTRUCTOR _____ PERIOD _____ PARTNER _____

UNIT 5: Earth's History

LAB 5-2: MATCHING ROCK LAYERS

INTRODUCTION: Geologists can determine the relative ages of the rock layers in a rock formation. But how do they determine whether the rocks or geologic events occurring at one location are of the same age as those at another location? The process of showing that rocks or geologic events occurring at different locations are of the same age is called **correlation**.

Geologists have developed a system for correlating rocks by looking for similarities in composition and rock layer sequences at different locations. Certain fossils, called **index fossils**, existed for a very short time and were distributed over a large geographic area. They aid the geologist in correlating sedimentary rock layers.

OBJECTIVE: You will be able to construct a geologic history of a region by observing rock layers in different localities.

VOCABULARY:

absolute age:

index fossil:

correlation:

PROCEDURE A:

The first set of four diagrams represent four outcrops at different locations.

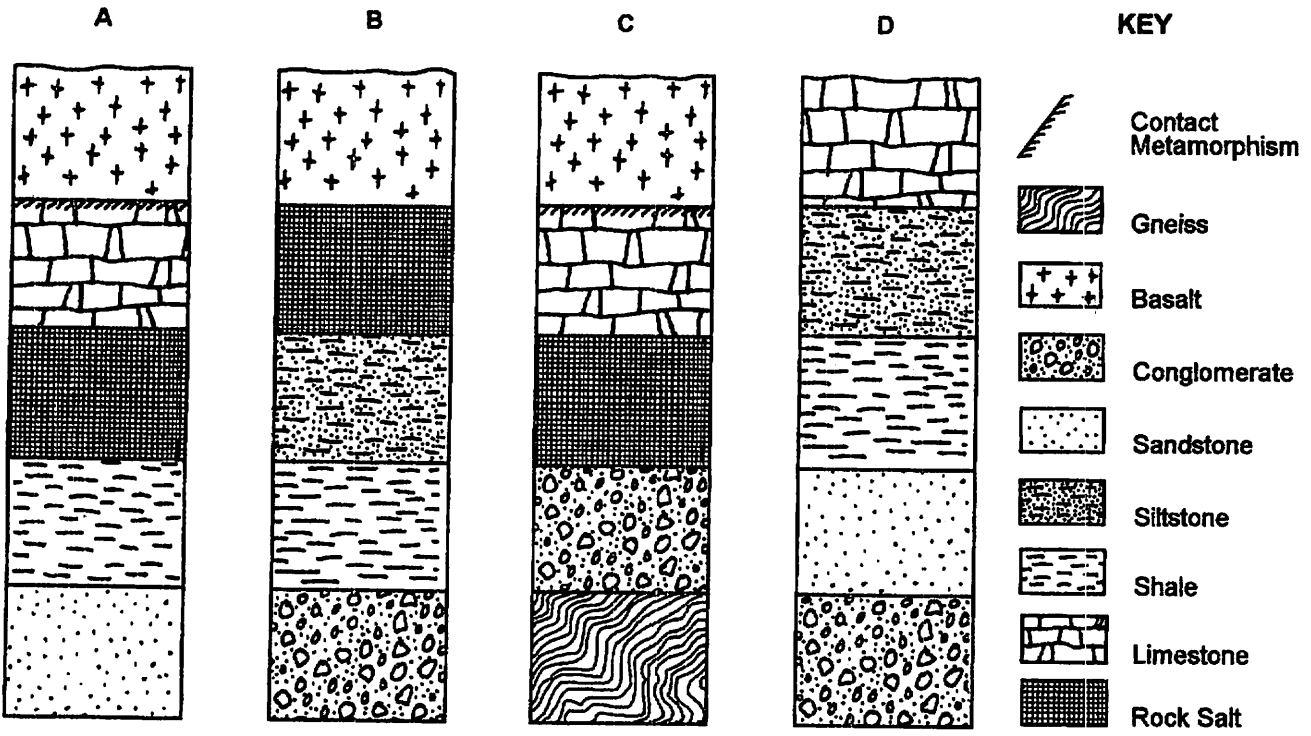
1. Reconstruct the complete sequence of events. Assume that the oldest rocks are on the bottom and the youngest are on top.
2. Draw in the layers on the appropriate column of the Report Sheet.

PROCEDURE B:

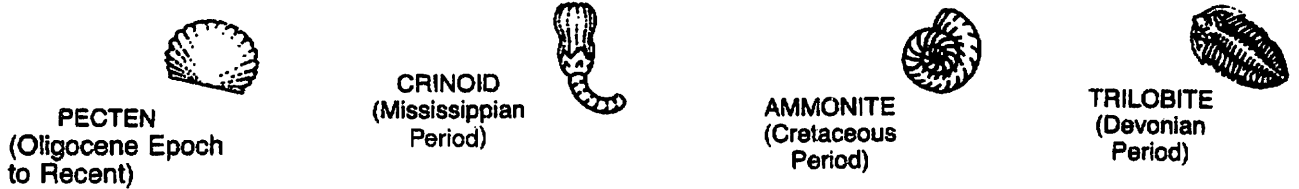
The second set of diagrams identifies four types of index fossils and shows four columns of fossil bearing rock strata. Assume overturning has not occurred.

1. Reconstruct the complete sequence of events and draw the layers (with the fossils if present) on the appropriate column of your Report Sheet.
2. By referring to your Reference Tables, identify any layer for which you have enough evidence to determine its age. On the Report Sheet, label its age and period/epoch. The abbreviation 'mybp' stands for millions of years before present. It may be expressed as a range of several million years.

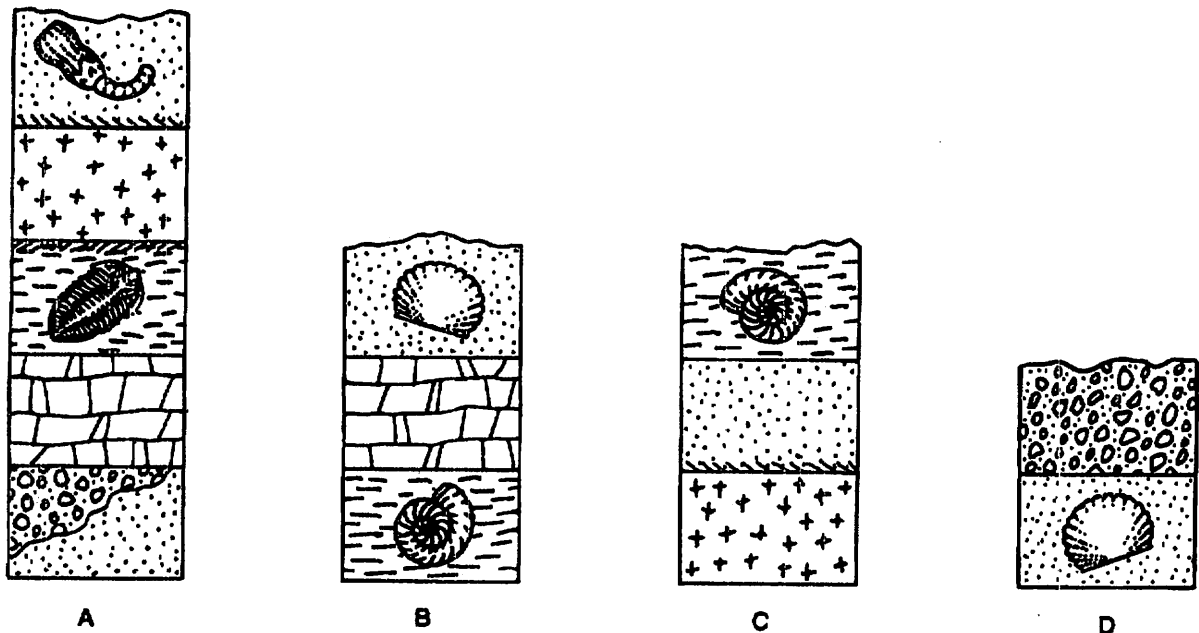
A: OUTCROPS FROM FOUR LOCATIONS



INDEX FOSSILS OF DIFFERENT GEOLOGIC PERIODS



B: ROCK STRATA CONTAINING INDEX FOSSILS



REPORT SHEET

Procedure A

Procedure B

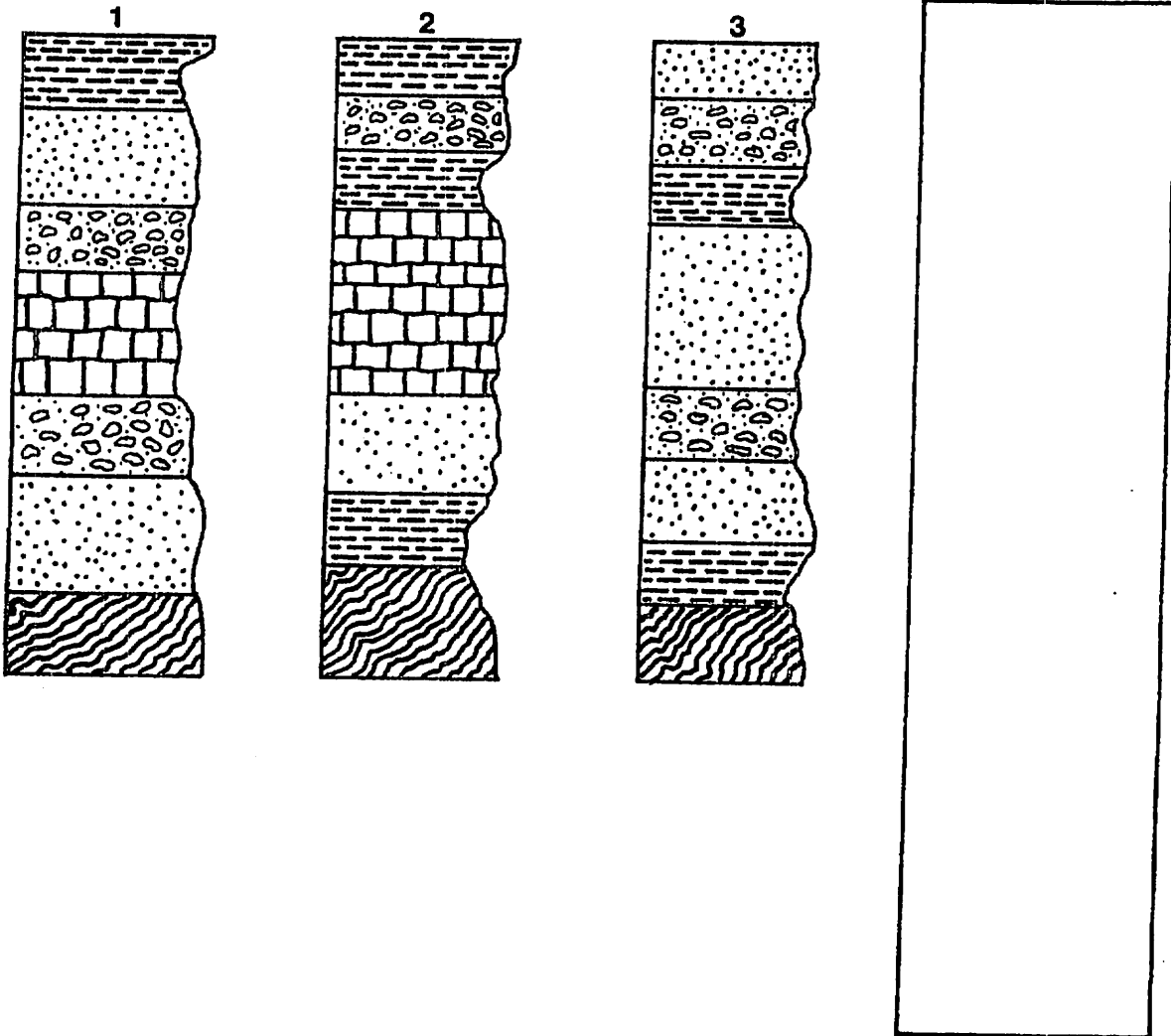
Date
mybp

Geologic
Period

PROCEDURE C:

The third set of diagrams represent three different outcrops. Using the rock type of the strata correlate the columns.

1. Draw lines representing equivalent boundaries between rock layers from one column to the next.
2. Reconstruct the complete column in the blank column. Assume that the oldest rocks are on the bottom and the youngest are on the top.
3. Draw in thick lines on columns 1,2, and 3 identifying the locations of unconformities.



DISCUSSION QUESTIONS: (*Answer in Complete Sentences*)

1. Explain why some rock layers can be missing from the sequence in some outcrops.
2. What does a field geologist look for in rock outcrops to help identify the different rock layers?
3. Why is it easier for you to correlate diagrams than it is for a geologist in the field to reconstruct a sequence of events?
4. In Procedure B, what is the youngest possible age of the rock stratum at the very bottom of the geologic column?
5. In Procedure B, how many years are represented between the top and bottom fossil bearing layers?
6. Explain why you can find the same type of fossil in different types of rock strata.
7. Explain how it is possible that a given type of fossil may be found in a rock stratum at one outcrop, but missing from that same layer at another outcrop.
8. In Procedure C, what is a reason that the limestone in column 1 is thinner than the limestone in column 2?
9. According to the appearance of the right side of each column in Procedure C, which rock type appears to be the least resistant to weathering and erosion?

CONCLUSION: Why is it necessary to observe the rock layers of several different localities in order to obtain a complete sequence of events?