

Regents Earth Science Bedrock Correlation

Name _____

Period _____

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Introduction:

The Finger Lakes Region of New York State is underlain by rocks of Devonian Age. Use your reference tables to determine the types of rocks that outcrop around the Finger Lakes:

The rocks include _____

Patterns of deposition and the existence of various fossils indicates that these rocks were deposited in a shallow sea that covered much of the central United States during that time. Over 1200 meters (that's about $\frac{3}{4}$ of a mile!) of sedimentary rocks are deposited in the Devonian of upstate New York. We can see continuous outcrops of over 100 meters of thickness in quarries (where stone is mined for building materials), in road cuts, and where rivers have cut deep gorges into the rocks. No one, however, has found a place where the entire 1200 meters exists in a single outcrop. How do you suppose geoscientists form a complete view of these rocks?

Imagine for a moment that you have several Earth Science books, each with large sections of pages missing. If, among the many pieces you had, there were some "overlapping" pages, you might be able to reconstruct a complete book from the pieces. Geoscientists do this with rock outcrops. They try to find similar rocks that overlap in different outcrops in an attempt to match them up, or *correlate* them.

In this lab you will correlate nine different outcrops from the area around Lake Cayuga to develop a complete 14 inch thick model of the rock layers (or STRATIGRAPHIC COLUMN) of the Devonian in that area. Each inch of your model represents about 10 meters of outcrop. The table below describes the actual rock units that outcrop in that area.

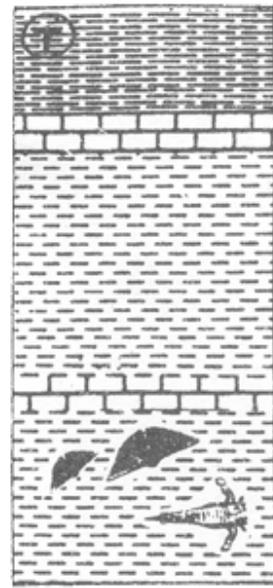
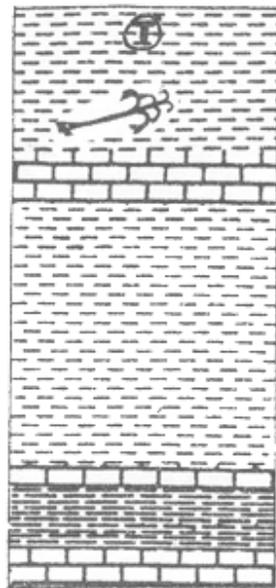
ROCKS OF THE LAKE CAYUGA BASIN, NEW YORK

FORMATION	DESCRIPTION
Sherburne Shale	Shale at bottom with increasing sand toward top
Geneseo Shale	Black Shale about 10 meters thick
Tully limestone	Limestone about 3 meters thick
Moscow Shale	Shale with limestone base about 15 meters thick
Ludlowville Shale	Shale, about 25 meters thick
Skaneateles Shale	Shale with limestone cap, about 28 meters thick
Marcellus Shale	Mostly shale, black at base, then thin limestone, 4 meters of limestone at top. About 25 meters thick
Onandaga Limestone	Highly fossiliferous limestone over 25 meters thick
Oriskany Sandstone	Thin sandstone about 1.2 meters thick
Manlius Limestone	Finely layered limestone about 7.6 meters thick
Rondout Dolostone	Dolostone about 7.5 meters thick

Procedure:

You've learned that SUPERPOSITION is an important concept when interpreting the rock record. It's important to know which way is up! Each of the outcrops drawn on the next page are marked with the letter "T" at the top of the outcrop.

1. Using a scissors or razor blade (no running, throwing, dueling, or anything but carefully cutting paper), carefully cut out the nine outcrops.
2. Lay the outcrops out on your desk and correlate the rocks in one outcrop with those of the others. You will find that the patterns in the layers are most useful and that fossils are sometimes useful and sometimes misleading. The rock descriptions in the table on the previous page will probably be helpful as well.



-  Sandy Shale
-  Sandstone
-  Shale
-  Limestone
-  Dolomite

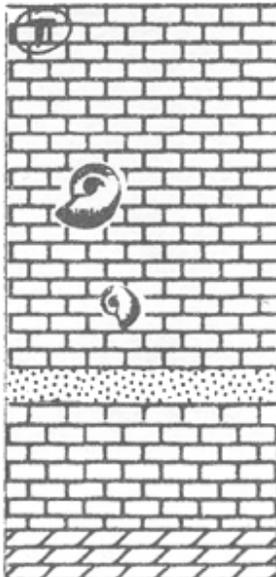
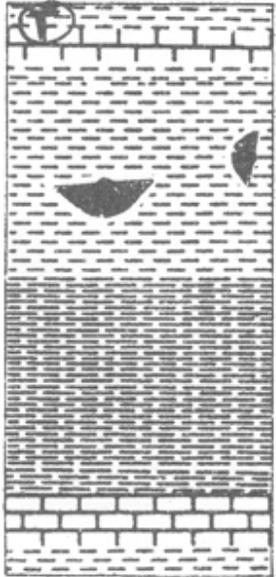
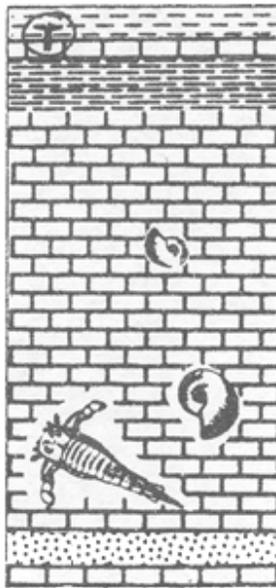
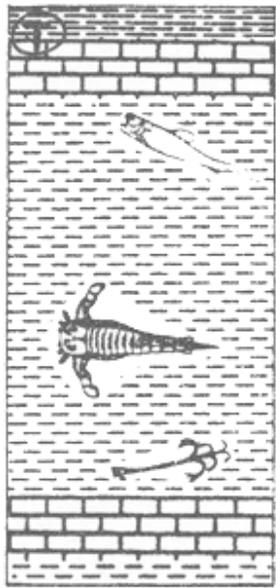


Figure 33.1

3. When you've got all the layers matched up, use a glue stick to attach them, correlated layers side by side, to a manila file folder.
4. Use the thicknesses and descriptions on the table on page 1 to label the top and bottom contacts of each formation and use some colored pencils to shade in the different formations. NEATNESS COUNTS!

ANSWER THE FOLLOWING QUESTIONS COMPLETELY AND NEATLY BELOW:

1. Which 3 formations are entirely limestone? _____
2. Which formations are entirely shale? _____
3. Which formation most likely was once a beach? _____
How do you know? _____

4. The Tully limestone stands out as a ridge of rock between valleys developed on the Moscow and Genesee formations. What might account for this landscape pattern? _____

5. Which is deposited closest to the shore of a sediment collecting basin: Sandstone, siltstone, or clay? _____

Explain _____

6. Look at the description of the Sherburne. How was the distance to (or from) the shore of the sea changing in this area as the Sherburne was being deposited? **Explain!** _____

7. The Onandaga contains a few thin layers of volcanic ash. Why is volcanic ash useful for correlating layers of sedimentary rock? (see your text if you don't remember or can't figure it out) _____

8. The Onandaga also contains fossils of crinoids, coral, trilobites, and brachiopods. Why are there no fossil ferns or primitive pine trees? _____

9. Why are the Eurypterids (see the reference tables) in these cross sections not useful as index fossils? _____

10. Of what use are **INDEX FOSSILS** to historical geologists? (see your text!) _____

11. What characteristics make an organism a good index fossil? _____

12. Will Man one day be a good index fossil? Explain: _____
