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Where the Hippos Roam

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Introduction:

Millions of years ago, ancestors of modern crocodiles lurked in the shallow waters of lakes and other bodies of water. They hunted fish and other animals, much as their descendants do today. If you could travel back in time to visit one of those lakes, you might see the ancestors of today's hippos there as well. Antelopes might browse along the edges of the lake, and rodents of various sizes might scurry back and forth. When paleontologists examine the fossil of a prehistoric organism, they may discover clues about the organism's life. They may also answer questions about the environment it lived in: Was the area hot or cold? Was it humid or dry? Then, by putting all of these clues together, the paleontologists may be able to learn a little more about how organisms and environments change over time. Unfortunately, studying a fossil site is no easy task! Often, a paleontologist may find a few teeth scattered over a very large area. In such cases, keeping track of where the fossils were found is very important.

In this activity, you will use the data from a fossil site to create a map of fossil locations at that site. Then you will make some conclusions about the past environment, or paleo-environment, at that location. The table below shows the locations of fossils that were found spread out over 22,500 m². A team of paleontologists decided that this site, which measured 150 m x 150 m, was too large to work on all at once. Therefore, they decided to create a grid of 10 m squares.

Starting in the northwest corner, they labeled the squares with the letters A-O from west to east. Then the team numbered the squares 1-15 from north to south. In this way, each fossil could be labeled with a letter and a number, depending on where it was found. For instance, the label A1 would signify the 10 m x 10 m square in the northwest corner of the site. Similarly, the label O15 would indicate the square in the southeast corner of the site.

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Activity:

Location of Fossils				
Layer	Hippos	Rodents	Crocodiles	*Bovids
A (use blue)	B11,C6,D3, I15,J10,L7, M6		C14,F7,G13, I3,L13,O2	
B (use red)	F2,J3,K1,K2	B10,B11,F13	H2,I7,K2, N5,N7	G14
C (use green)		B3,C10,D1, H8,M9,N4		A5,A6,E2, E4,E14,H7, H8,H12,K4, M1,N15

* Bovids are antelopes and other similar animals

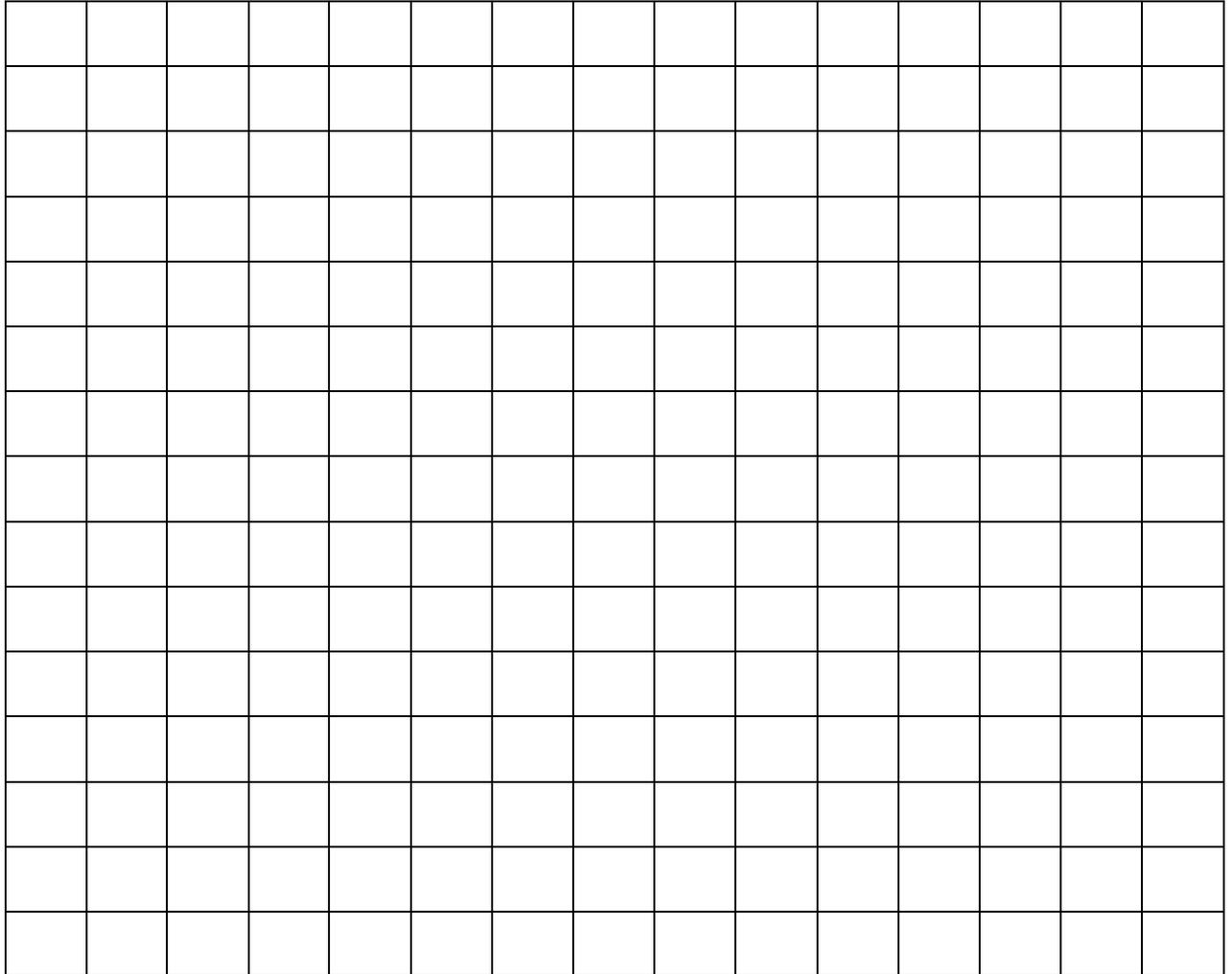
Problem:

1. Look at the map of the fossil site. The scale should be 1 cm = 10 m. Label the grid of squares with letters and numbers as explained above.
2. Using the table above, show where the fossils were found. Use colored pencils or crayons to write your letters. Put an *H* in each square where a hippo tooth was found; use *R* to indicate a rodent tooth, use *C* to show a crocodile tooth, and *B* for a bovid tooth. Write in blue for layer A, red for layer B and green for layer C
3. There may be more than one letter in a square. Think about when these animals may have lived and in what type of environment (aquatic or terrestrial).

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Name: _____ Date: _____ Period: _____

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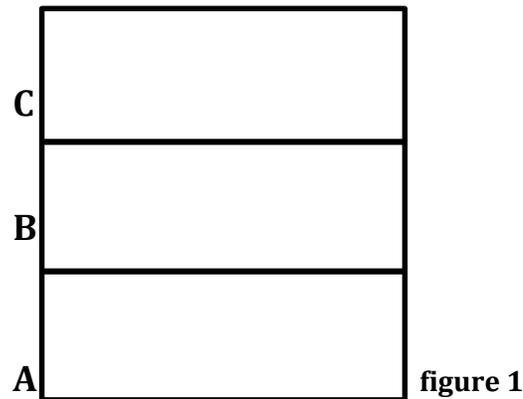
This map represents an aerial view of the site excavated. The deepest layers are blue, the shallowest areas are green.

Questions:

1. Layer A (blue letters) is deepest/oldest layer, what animal's fossils are found there?
2. Layer B (red letters) is the next layer up, what fossils are there?
3. Layer C (green letters) is the top/youngest layer, what fossils are found there?

4. In the image (figure 1) below, Color layer A blue, layer B red and layer C green. Write the letters representing the fossils found there on each layer.

Example:



5. What type of environment are hippos and crocodiles found in?
6. Describe how the environment at this site (figure 1) changed over time and how you determined this.
7. One member of the team wished to look for fossils of dry-climate plants at this site. Which layer or layers do you think would be most likely to yield fossils of this kind? _____ Explain your answer.
8. Which layer has the oldest fossils?
9. Hypothesize why crocodiles and hippos are no longer found in this area?
10. When the paleontologists were analyzing these data, they proposed several hypotheses to explain the changing climate. One of them, Dr. Upsted, suggested that tectonic plate uplift had occurred, causing the area to gain elevation (higher ground) over time. A second paleontologist, Dr. Downer, disagreed stating that the area probably lost elevation (sunk lower) over time. Whom do you agree with? _____ Explain your answer and use fossil evidence to support it.