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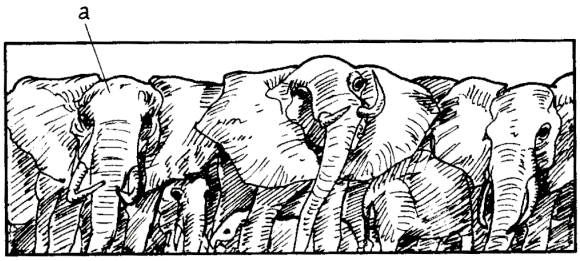
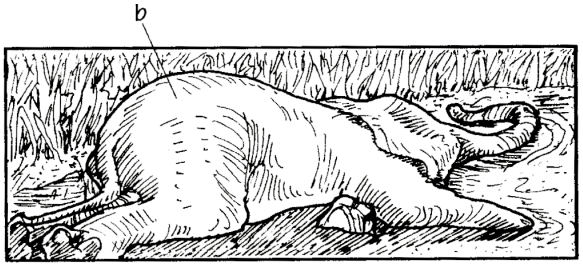
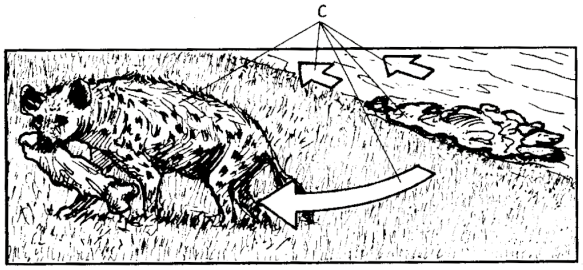


HERD$_a$

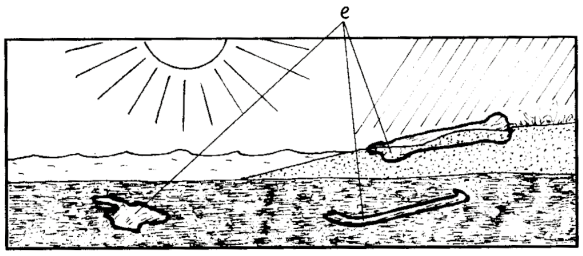


DEATH AND DECOMPOSITION$_b$



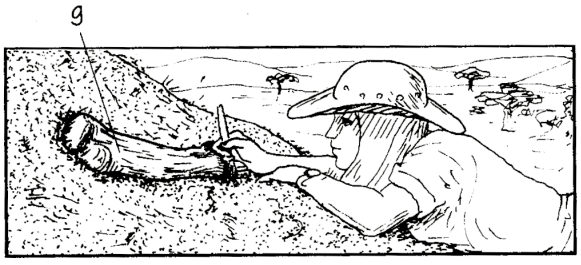
TRANSPORT$_c$

TRAMPLING$_d$



WEATHERING AND BURIAL$_e$

FOSSILIZATION$_f$



EROSION AND EXCAVATION$_g$

LABORATORY ANALYSIS$_h$

diagram adapted from The Human Evolution Coloring Book (2000) by Adrienne L. Zihlman

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Follow the directions below to color-code the diagram and to answer the questions. You can use p.300 of your textbook to help you. Use colored pencils, and check off each box ☑ as you finish that part of the instructions.

For this exercise, you will be observing what happens to the bones of an elephant after it has died. As hundreds of thousands of years pass, the bones become fossilized, and eventually are discovered. Hopefully, you will begin to understand how rare it is to find a fossil at all.

Diagram a. Begin by coloring all of the elephants in the picture titled HERD. Use gray to color both the word HERD □ and the elephants □ .

Diagram b. At some point, an elephant dies. It could be from disease, a lack of food, old age, or something else. When this particular elephant dies, it collapses on the bank of a river. Color the rotting elephant reddish brown □ along with the title DEATH AND DECOMPOSITION □ . The river water should be blue □ , the sand on the riverbank yellow □ , and the grasses light green □ . Decomposition means that the body of the elephant is beginning to break down and rot. As the elephant's body begins to decompose, it slowly sinks into the mud and sand, and gets covered up.

Which dead animal would be more likely to be turned into a fossil: one buried in river mud, or one that dies in the middle of a plain? Explain your answer.

Diagram c. Burial of a dead animal in mud and sand does not always happen quickly. Sometimes, carrion eaters (animals that eat dead and rotting things) get to the parts that have not been completely buried. If the body of the dead animal is in moving water, parts may float off downstream. Color the title TRANSPORT red □ , along with the arrows □ . The water in the river should be blue □ , the grasses light green □ , the hyena yellow brown □ , and the rotting elephant pieces (yum!) in the water and the hyena's mouth reddish brown □ . The bone sticking out of the end of the piece the hyena has should be light gray □ .

Why would the natural force of transport make it more difficult to identify parts of a fossil skeleton?

Diagram d. If bones are on the surface, instead of being buried in mud, other animals besides carrion eaters can disturb the bones. In the picture titled TRAMPLING, a happy herd of zebras is galloping over the elephant bones. The zebras are not doing it to be destructive; the bones just happen to be where they are running. Color the bones on the ground light gray □ and the grass light green □ . Leave the destructive zebras uncolored, as they are already black and white.

What sort of damage would trampling do to the bones on the ground?

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Diagram e. Okay. The local animals have finished messing with the elephant bones. Time for nature to take over. Start by coloring the bone pieces light gray □ . Color the sand (little dots) on the riverbank yellow □ , the water and waves under the sun blue □ , and the mud along the bottom of the picture brown □. Color the diagonal lines representing rain (in the upper right of the picture) blue □ . Make the sun light orange □ . The rain soaks the bones, breaking them down, and the sun drying the bones makes them twist up and crack. The bones may change their shapes and become broken into smaller pieces before becoming buried in the mud. Now color WEATHERING in light orange □ , AND in blue □ , and BURIAL □ in brown.

How would weathering affect the bones before they got buried?

Diagram f. Now the bones stay buried for hundreds of thousands of years. During this time, minerals in the ground replace the bone cells, turning the bone into rock. Color the fossils light brown, then orange on top of the light brown □ . Look at the hill that contains the bones, and you should see three layers of rock. Color the top layer (with the dots) yellow, because it is made of sand particles □ . Color the middle layer light brown □ , and the bottom layer brown □ , as they are both made from dried river mud. Color any grass in the picture (on top of the hill, in the field in the distance) light green □ .

How long does the process of fossilization take?

How does the process of fossilization change bones?

Diagram g. Time for the fossils to be discovered. Color the fossil light brown, then orange on top of the light brown □ . Color the rock around the fossil light brown □ , because it is made from dried river mud. Color the paleontologist with realistic colors □ . Color EROSION AND EXCAVATION using the same color that you made the paleontologist's shirt □ .

What kinds of rocks should you examine if you want to find fossils? _____

Why is there only one fossilized bone in this diagram?

Diagram h. When the fossilized bones are brought back to a lab, they will be closely studied to try and figure out what kind of animal it was, and how the animal died. Color the fossils light brown, then orange on top of the light brown □ . Color the paleontologists and the lab with realistic colors □ .

Would the paleontologists have all of the fossilized bones from the original elephant? Why or why not?