

Prehistoric Life Guided Tour Pre- or Post-Visit Working as a Paleontologist Lesson Plan

Grade	Suggested Time	NGSS Connections
6-8	60 minutes	<p>MS-LS4-1: Apply and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past</p> <p>MS-LS4-2: Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.</p> <p>MS-ESS2-3: Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of past plate motions.</p>

Learning Outcome

Students will better understand how paleontologists conduct their work in the field and how they use the skeletal structures and other features of modern organisms to try and identify what kind of organism they have “dug up” based on adaptations.

Materials

The Great Fossil Find: Narrative (for instructor, read to class)
 The Great Fossil Find: Worksheet (one per student)
 The Great Fossil Find: Skeletal Resource Manual (one per team)
 Edmontosaurus Bones Sheet (one per team, cut out with pieces placed in an envelope)
 Edmontosaurus Key Sheet (for instructor to aid students if they have questions)

Background and Key Vocabulary

Paleontologists are scientists that study life forms from past geologic time periods. A modern organism is something that is alive today. A fossil organism is something that was alive, but has been dead for a very long time. Their existence is only proven by the fossils people find around the world. Many of these organisms have adapted similar features, physical and nonphysical, as one another over time.

Activity

1. Assign students into groups of however many you see fit.
2. Read students through the **Narrative** step by step, leading them through the simulation of a fossil dig and completing **Part I** of their worksheets.
3. After the activity is over, have students complete **Part II** of their worksheets.

Adapted from:

Flammer, L., J. Beard, C.E. Nelson, & M. Nickels. 1998. *ENSIWEB*. Evolution/Nature of Science Institutes. Retrieved Jan. 14 2016 from

www.indiana.edu/~ensiweb/

Steve Randak, Michael Kimmel; 1997; *The Great Fossil Find*;

The Great Fossil Find: Narrative [READ TO CLASS]

In this activity, you and the members of your team will play the roles of paleontologists working at a fossil dig in Montana. One clear crisp afternoon in October, you find 3 well preserved and complete fossil bones.

*(Withdraw **3 fossil bones** from your envelope. Make sure you take them out **without** looking at the ones remaining in the envelope!)*

It is too late in the day to continue digging, so you return to camp with your finds.

A. That night in camp, after dinner, you and your colleagues begin to assemble the 3 bones you found earlier. Since the bones were all found together and in an undisturbed layer, you assume that they are all from the same animal. You spend the rest of the evening trying different arrangements of the bones in hopes of identifying the animal.

(Give the student the next 3-5 minutes to try various combinations.)

As the night wears on, you get tired and decide to begin again in the morning.

(Have the students write down on your worksheet the type of animal you think it might be.)

B. The morning is clear, cool, and clean. Just the kind of day you need to get work done at the dig. The rock layers that hold your fossils are very hard and only give you two more specimens. With the day at an end, you make your way back to camp for another try at assembling this mystery animal.

*(Have the students withdraw **2 more bones** from the envelope. Use the next 3-5 minutes to have students incorporate their new finds in their fossil reconstructions.)*

It's getting late, and you are getting weary. Maybe tomorrow you will find the answer to the puzzle.

(Be sure they record their latest suspicion of the type of animal suspected.)

C. The next day is cold. It is the last day of the digging season. You must leave the dig tomorrow. Just as the day is about to end, one member of the group cries out "I've found more! I've found more!"

*(Have the students withdraw **2 more bones** from the envelope. Give the students 3-5 minutes to incorporate these latest finds. Have them record what they think it is.)*

D. Back in the temporary lab on-site, you go searching in the resource library, and you find some partial skeleton drawings from another group working at a different location but dealing with the same geological period. They have found a skeleton similar to yours, but with some additional bones that you don't have. You use this information to add to your own data.

(Give the students 3-5 minutes to compare their findings with those of a team near team, looking for clues that might help them in their reconstruction. They should apply these latest clues to the assembly of their skeletons as best they can, and should record the type of animal they suspect. Have them be specific.)

E. Once you are back in your own laboratory at your university, you find a Skeletal Resource Manual with drawings of the skeletons of some existing animals. You notice some interesting similarities between some of the drawings and your unknown fossil.

(Have students use the drawings for assistance in their final assembly of the fossil skeleton. Have them record their final interpretation. Note any resourcefulness as you circulate amongst your students, e.g. using their texts, supply catalogs, etc.)

F. Answer the questions on your worksheet. When done, be sure to return all of the "fossil bones" to the envelope.

Name:

Date:

The Great Fossil Find: Worksheet

Part I: THE DIG

A. Day 1 (3 bones total): Type of animal suspected: _____

B. Day 2 (5 bones total): Type of animal suspected: _____

C. Day 3: (7 bones total): Type of animal suspected: _____

D. Day 4: (collaboration with another team): Type of animal suspected:

E. Day 5: (after consulting resource booklet): Type of animal suspected:

Part II: QUESTIONS

1. Did you make any assumptions or inferences at the beginning of the activity that kept you from assembling the "right" skeleton (i.e. your final interpretation)? Explain:

2. Did the discovery of new bones cause any conflict within your group? Explain:

3. Did any of your group members resist changing in light of the new information? Explain:

4. Did the information from another group influence your assumptions? If so, what info?

5. Did the resource booklet confirm your group's ideas, or did it cause you to rework your arrangement of the fossil parts? Explain.

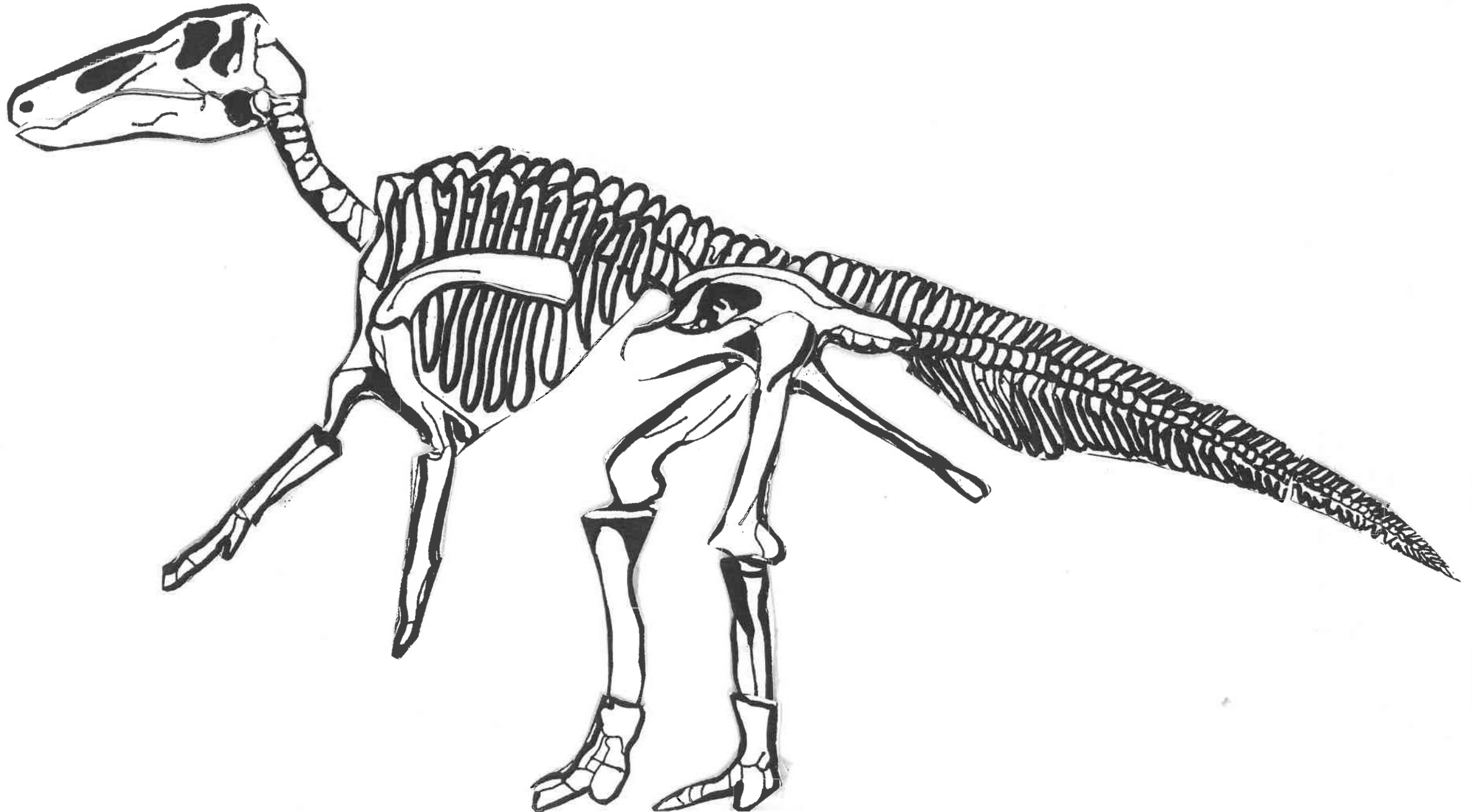
6. If this "Fossil Find" scenario is typical of the work of scientists, what features of the nature of science does it demonstrate?

7. From looking at the fossil and the resource manual, what could you say about how and where this animal lived?

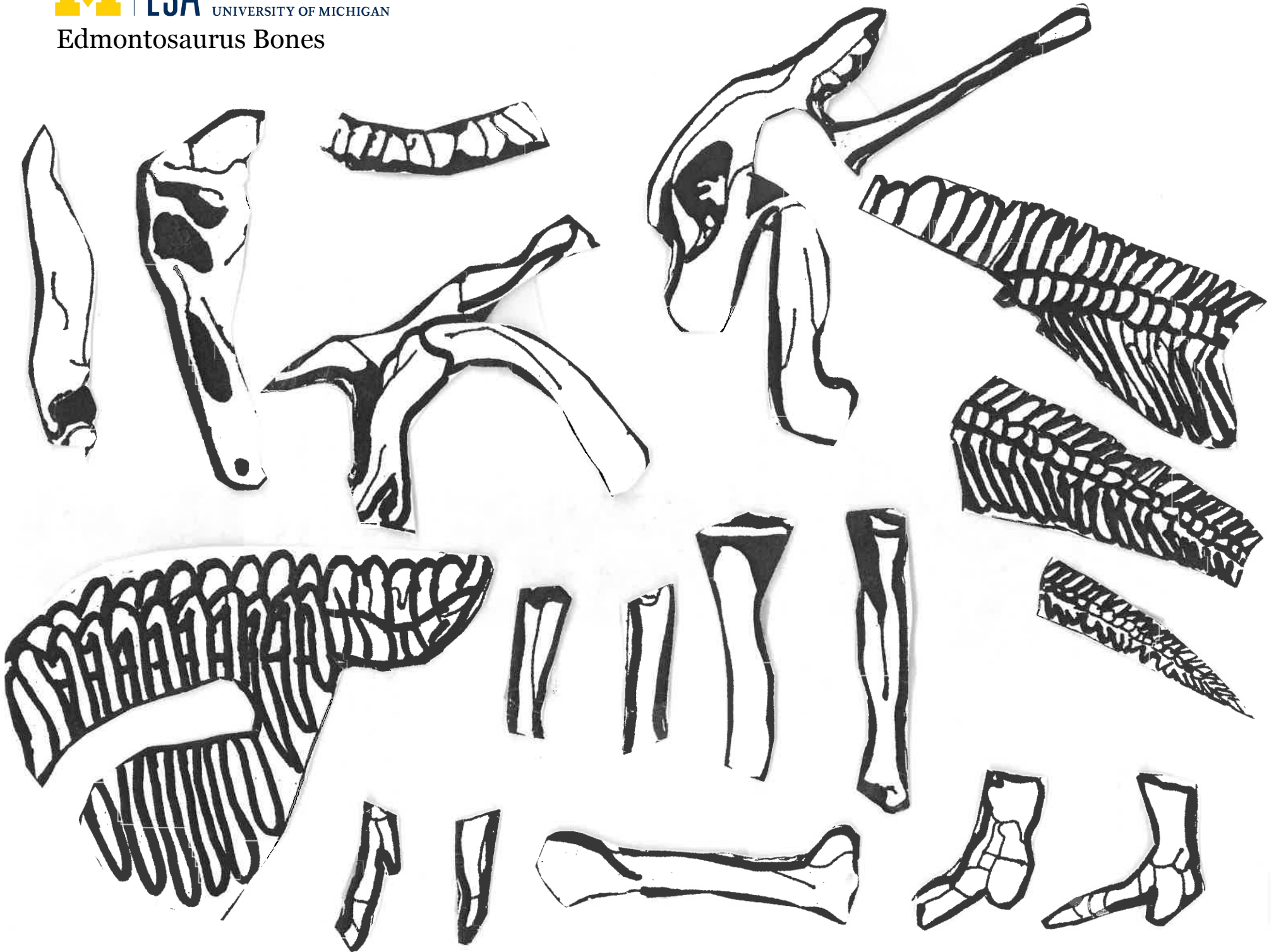
8. Is it possible for scientists to do studies about things that happened millions of years ago? Explain.

9. List what you see as the 3 goals of this experience.

Edmontosaurus Key

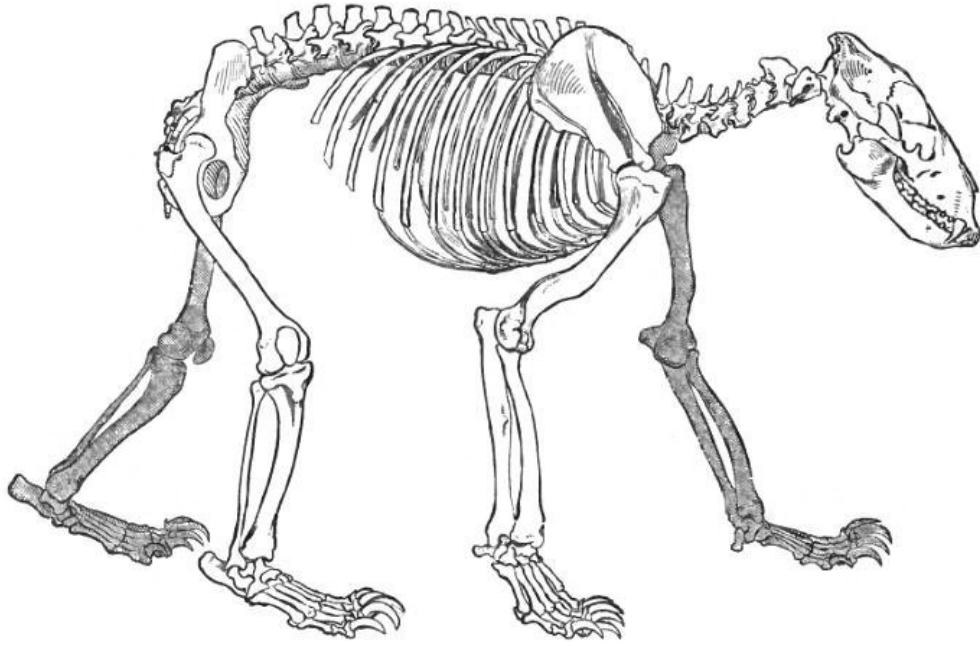


Edmontosaurus Bones

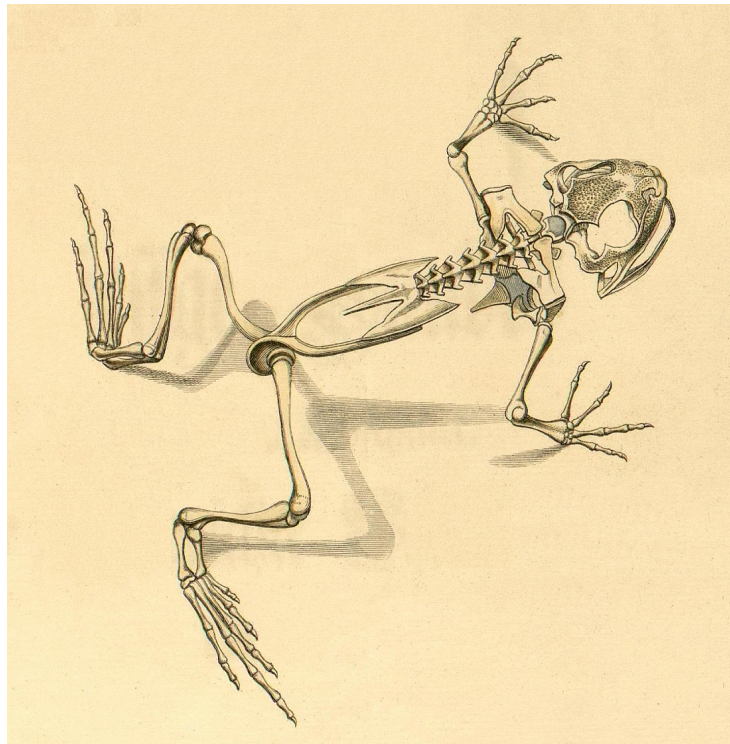


**SKELETAL
RESOURCE
MANUAL**

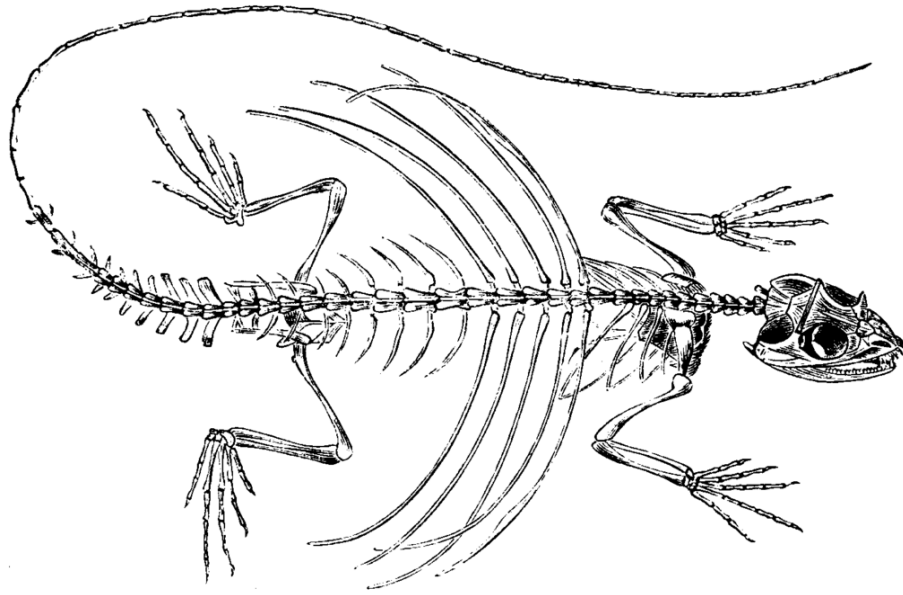
BEAR



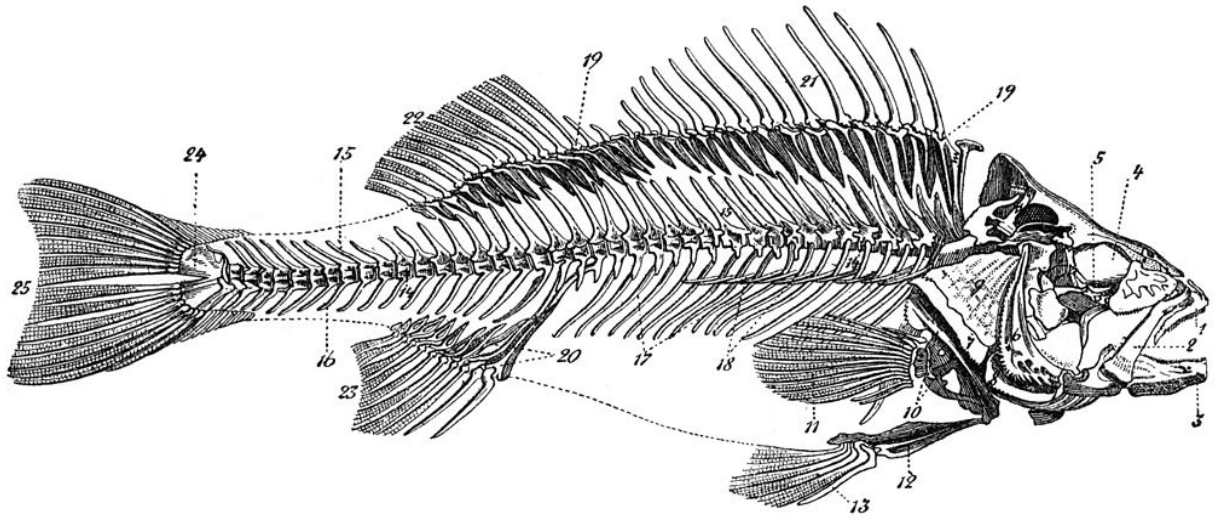
FROG



LIZARD



FISH



BIRD

