

WHO IS IT FOR?

- ◆ Young Scientists . . .
- ◆ Evolving Mathematicians . . .
- ◆ Emerging Linguists . . .
- ◆ Sprouting Historians . . .
- ◆ Budding Artists . . .

TARGETED LEVEL:
(Kindergarten)

THE CHALLENGE:

The students will . . .

- ⇒ become familiar with time lines and the passages of time.
- ⇒ learn about time as it relates to duration and chronology.

SAFETY ISSUES & CONCERNS:

- * Students should take care with the use of scissors.

WHAT'CHA NEED?

1. Adding machine tape.
2. Cut-outs of Dinosaurs, ancient birds, mammoths and a picture or drawing of each child.
3. Materials for decorating their Mammoth picture; hay, tooth picks, fur/hair, markers, etc.)
4. Calendar

**TIME NEEDED FOR
the Post-visit Activity:**
Minimum of 45 minutes.

A Digging We Will Go

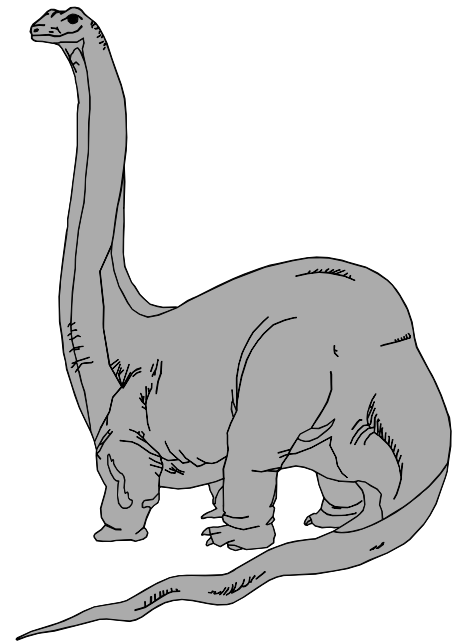
Post-visit Activity

An understanding of geologic time has two aspects: duration and chronology. Students' understanding of duration may be based on the concepts of a "short time" or a "long time" or may even hinge on their ideas of "old". Students' idea of chronology is usually based on the concepts of "before" and "after" when arranging objects by age. This latter idea of chronology is the arrangement that constitutes a time line.

The concept of age in the context of geologic time may refer to either its durational or chronological aspects. By grouping or spacing the organisms on a time line to reflect notions of short time, long time, and very long time, students both develop and reveal their grasp of duration.

Their grasp of chronology is developed and revealed by how they arrange objects in a line to reflect a sequence of events. The position represents the time when the organism existed and is selected based on the student's notions of before and after.

In this activity students will create their own time lines. The starting point will be set for the era of dinosaurs and the ending point will be the present.



WORDS TO KNOW?

7. Pre-historic
8. Time Line

DID YOU KNOW?

The age of organisms can be determined by either the absolute dating method or the relative dating method?

Absolute dating of fossils is often done by measuring the amounts of a radioactive isotope and its decay product?

Relative dating of fossils is a method, which is based on the observation that different layers of sedimentary rock contain different fossils, and that this sequence can be recognized in other rocks at other locations?

Quarries, roadcuts, and cliffs are good places to start using your paleontological skills for finding fossils.

EXTRA STUFF?

Related books/stories and on-line sources:

Ault, Charles R., Jr., 1982, *Time in geologic explanations as perceived by elementary school children*. Journal of Geological Education.

Eicher Donald L., 1968, *Geologic Time*. Englewood Cliffs, NJ: Prentice Hall.

Gould, Stephen J., 1987, *Time's arrow, time's cycle: Myth and metaphor in the discovery of geological time*. Cambridge, MA: Harvard University Press.

Toulmin, Stephen and Goodfield, June, 1965, *The Discovery of Time*. London: Hutchinson & Co.

TEKS

CONNECTIONS:

Science TEKS, Kindergarten:

K.2 (A) The student will ask questions about organisms, objects, and events.

K.2 (D) The student will construct reasonable explanations using information.

K.6 (A) The student is expected to sort organisms and objects into groups according to their parts and describe how the groups are formed.

PROCEDURES:

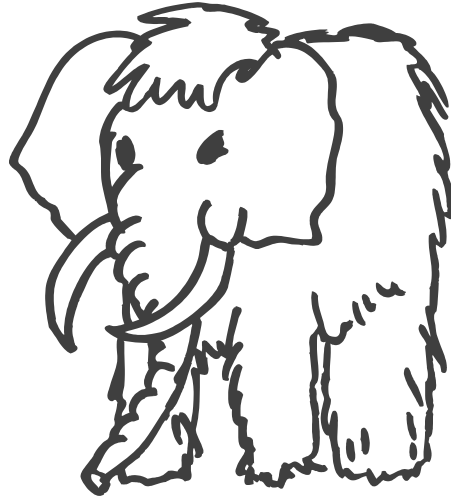
Ready, Set, Go . . .

1. Familiarize the children with time lines and the passage of time through the use of a common calendar.
2. Discuss how time has passed and how things have changed as time passes.
3. Discuss the Mammoth from the dig site. What are some possible reasons why this organism no longer exists?
4. Discuss dinosaurs. Why do they no longer exist?
5. As the discussion progresses, hand each student a piece of adding machine tape, which will represent his or her "time-line."
6. Introduce each of the items (pictures) that will be placed on their time lines by asking the students if they know what organisms the pictures represent.
7. Ask students - of all of these organisms, which one do they believe is the oldest. As the discussion continues, clarify what "oldest" means.
8. Ask students - of all of these organisms, which one do they believe is the youngest. As the discussion continues, clarify what "youngest" means.
9. Through this discovery process, the students will come to realize that for this time line, the dinosaur is the "oldest" organism and they are the "youngest."
10. Have the students place the pictures of the dinosaur on the left end of the tape and the pictures of themselves on the right end.
11. Ask the students which organisms do they think might have come after the dinosaurs? (Dinosaurs are the ancestors to birds, so birds would follow dinosaurs on the time line.)
12. Have the students place the pictures of an ancient bird after the picture of the dinosaur.
13. Ask the students, do mammoths still exist? (Because of the pre-visit experience as well as their On-Site Adventure at the EFEC, all of the students will know the answer to this one!)
14. Ask the students to place the picture of the mammoth in the appropriate place on the time line.
15. Have the students hang their time-lines around the room.
16. Encourage the students to draw the area where they believe the Mammoth lived in the background of their picture.
17. Encourage the students to look for and check out books on mammoths from the library.

Procedures continued . . .

18. Read one of the books suggested from the resource section of the On-Site activity. (I recommend *Wild and Woolly Mammoths* by Alike!)
19. Encourage the students to take a trip to the Fort Worth Museum of Science and History and view the Dinosaur Exhibit.

Assessment:
Time-lines



The Bottom Line: Time lines are useful tools. They allow students to concretely place events in chronological order.

