Student Sheet

Evolutionary Timelines

Name:_____
Period:_____

Purpose: In this activity you will, based on current scientific theory, assemble a scale model, timeline of the universe from the Big Bang to the present.

Background Information: Life developed many billions of years ago, beginning with the smallest particles which compose matter to the most complex eukaryotic organisms alive today. Scientists use mathematical and physical theory to help them construct how the universe began. They use the fossil record to help establish the development of life on earth.

Prediction: If the universe formed 15 BYA (Billion Years Ago), during which billion years do think the most rapid expansion of life occurred?

Procedure:

1. Measure as accurately as possible 15.5 meters of 3” wide cash register tape.
2. Measure 25 centimeters from one end draw a line straight across the tape and label it "Present" or "Now".
3. Accurately measure and label the years ago every 10 centimeters (100 million years), make and label time markers (lines straight across the tape) until you reach the 5 meter mark (5 billion years ago).
4. At the 5 meter mark change the time markers to every 50 centimeters. Do this until you reach 15 billion years ago.
5. Go back and use a darker line to show the billion year marks. (1000 million = 1 billion)
6. Color the drawings representing major events in time before you cut them out.
7. Cut out the drawings of the major events in the history of time. Expose the arrow in the bottom left-hand corner.
8. Start at the "Big Bang" and paste the drawings on the timeline moving toward "Now". Paste the drawings on the timeline area that corresponds to the time shown on the drawing. The arrow should be closest to the "Now" line, the top of drawing closest to the "Big Bang" line, don't place the drawings sideways on the timeline. It is easy at first, the events seem to

be rather well spaced out. You can glue the backs of the drawings completely down on the timeline. As you will find out, however, the last 1.5 meters (1.5 billion years) gets rather crowded and you must glue just the bottom edge (the edge with the arrow) to the paper. The last twenty or so drawings will take on the appearance of pages of a book if this is properly done.

Analysis Questions:

1. How did Hydrogen and Helium, products of the Big Bang form into the heavier elements like Carbon, Nitrogen, and Oxygen, which make up our bodies?

2. How long after prokaryotic cells formed did eukaryotic cells finally emerge? What are the significant differences between these two types of cells?

3. Why was the formation of carbon dioxide important and what did it lead to?

4. Why do you think fossils were scarce until around 500 MYA?

5. When did the first organisms appear on land? What adaptations do you think were important for this transition?

6. When were early apes first found to exist and what geographical feature did their appearance coincide with?

7. What role do humans seem to play in the grand scheme of things?

8. Where on your timeline is the majority of life and diversity located?

Conclusions: Please explain 2 concepts you learned by doing this activity. Be sure to use complete sentences in your explanation.