BUILDING A TIME LINE OF LIFE ON EARTH

Materials:
460 inches of string
Tape measure
Small sticky squares or circles
Pictures/diagrams

Making the Time Line (before class):

1. The age of the earth is estimated as 4.6 billion years old. Using a string 460 inches long means that 1 inch = 5 million years.
2. Place a sticky square at the end and mark it 1. This is the origin of the earth at 4.6 bya (billion years ago).
3. Measure 80" from the end and add a sticky square, marked 2, for the origin of life at 3.8 bya.
4. Measure 100" from square 2 and add a square, marked 3, for the start of photosynthesis at 2.8 bya.
5. Measure 140" from square 3, add square 4 for the first eukaryote at 1.4 bya.
6. Measure 73" from square 4, add square 5, for the first multicellular organism at 0.67 bya.
7. Measure 20" from square 5, add square 6, for the first dinosaurs at 0.2 bya.
8. Very close to the present time end, add square 7, for the first homo sapiens at 0.0005 bya.
9. Wrap string around cardboard starting with the present time, square 7.
10. Cut out the pictures.

During Class:

1. Put up the start of the string with picture 1 taped to square 1. Unwind string and put up picture 2 taped to square 2. Talk about going from inorganic molecules of non-life to the organic molecules of life, using Miller & Urey experiment. This is also a good time to talk about RNA world (http://originoflife.net/rna_world/index.html and others) if desired.
2. Put up picture 3 taped to square 3-photosynthesis starts at 1.4 bya. Can talk about the stromatolites of 2.5 bya then using sunlight as an energy source for the first time. This also is the beginning of atmospheric oxygen.
3. Putting up picture 4, the first eukaryote, is an opportunity to discuss endosymbiosis (http://student.ccbcmd.edu/~gkaiser/biotutorials/eustruct/endosym.html and others.)
4. With pictures 5-7, note that the pace of change has increased.
5. With picture 6, the first dinosaurs, gives an opportunity to discuss the demise of the dinosaurs 65 mya. (http://www.unmuseum.org/deaddino.htm and others) as well as discussing punctuated equilibrium and repeated meteors over time.
6. The final picture, the first humans, can engage students in discussion of what makes a human, the presence of Neandertal DNA in modern genome, etc. Nova's Becoming Human series at www.pbs.org is excellent at early hominids.

Credit: Dr. Alice Sessions, Austin Community College
1. Earth Forms 4.6 BYA

http://ircamera.as.arizona.edu/NatSci102/lectures/lifeform.htm

2. Origin of Life 3.8 BYA

http://ircamera.as.arizona.edu/NatSci102/lectures/lifeform.htm

3. Photosynthesis Starts 2.8 BYA


4. First Eukaryote 1.4 BYA

http://ircamera.as.arizona.edu/NatSci102/lectures/lifeform.htm

Pearson Education
5. Multicellular Organisms 0.67 BYA

6. First Dinosaurs 0.2 BYA

7. First *Homo sapiens* 0.0005 BYA