

Bio 112 Handout for Evolution 8

This handout contains:

- Today's iClicker Questions
- Handouts for today's lecture

iClicker Question #5A - before lecture

Consider the hypothetical creatures on the last page of this handout. Which of the following is the most likely order of evolution for the creatures listed?

- A. (first) 6 8 3 2 (last)
- B. (first) 2 8 3 6 (last)
- C. (first) 2 3 6 8 (last)
- D. (first) 2 3 8 6 (last)
- E. none of the above

iClicker Question #5B - after lecture

Put the following events in order from the first (happened longest ago) to the last (happened most recently).

- (A) First plants on land.
- (B) First plants.
- (C) First animals on land.

- A. A then B then C.
- B. A then C then B.
- C. B then C then A.
- D. B then A then C.
- E. C then A then B.

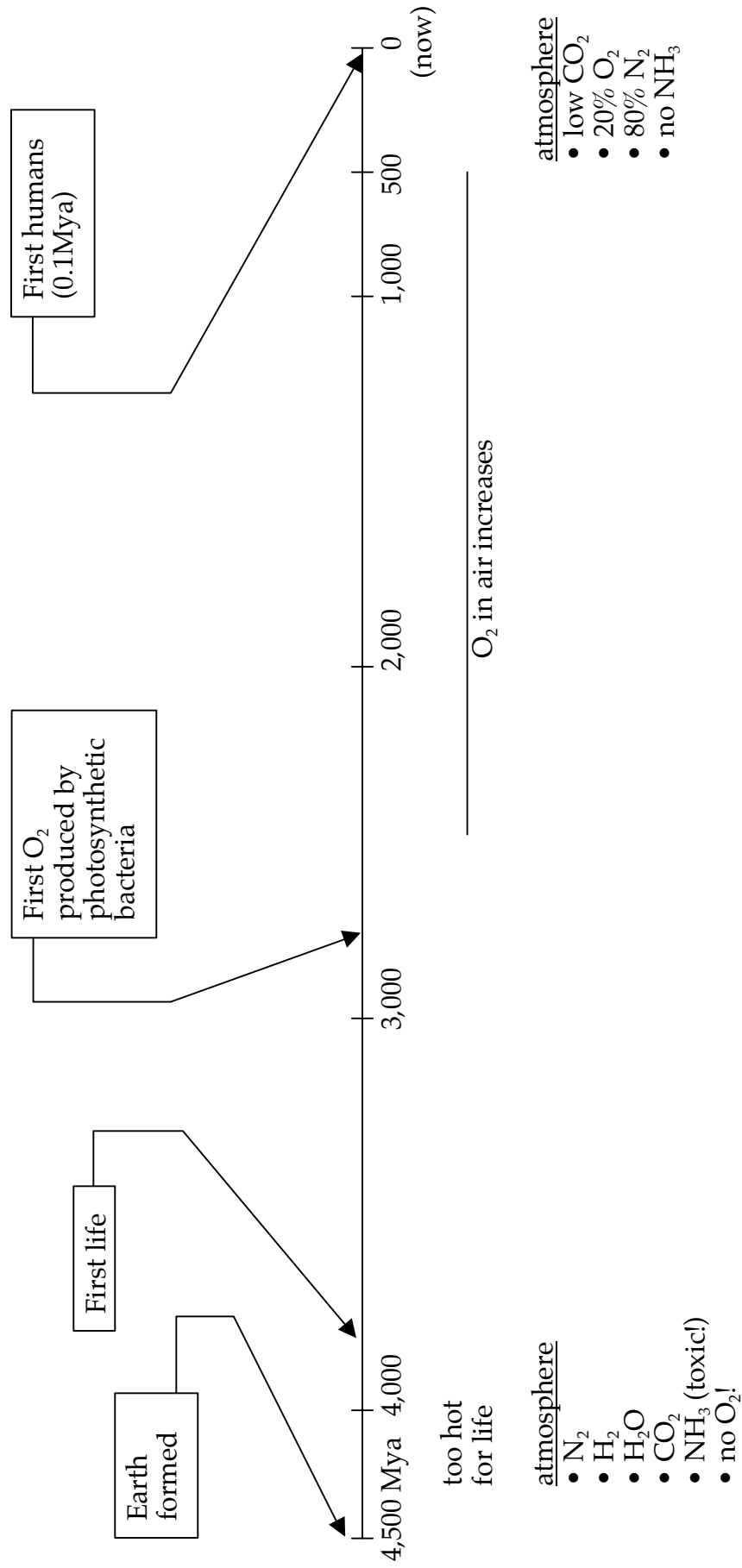
Beaming in your answers

1. Figure out your answer and select the appropriate letter (A-E).
2. Turn on your iClicker by pressing the "ON/OFF" button; the blue "POWER" light should come on. If the red "LOW BATTERY" light comes on, you should replace your batteries soon.
3. Transmit your answer as follows:
 - a. Press the button corresponding to the answer you've selected (A thru E).
 - b. The "STATUS" light will flash green to indicate that your answer has been received. If the "STATUS" light flashed red, your answer was not received; you should re-send it until you get a green "STATUS" light.

Bio 112 Earth History I (the *very* big picture)

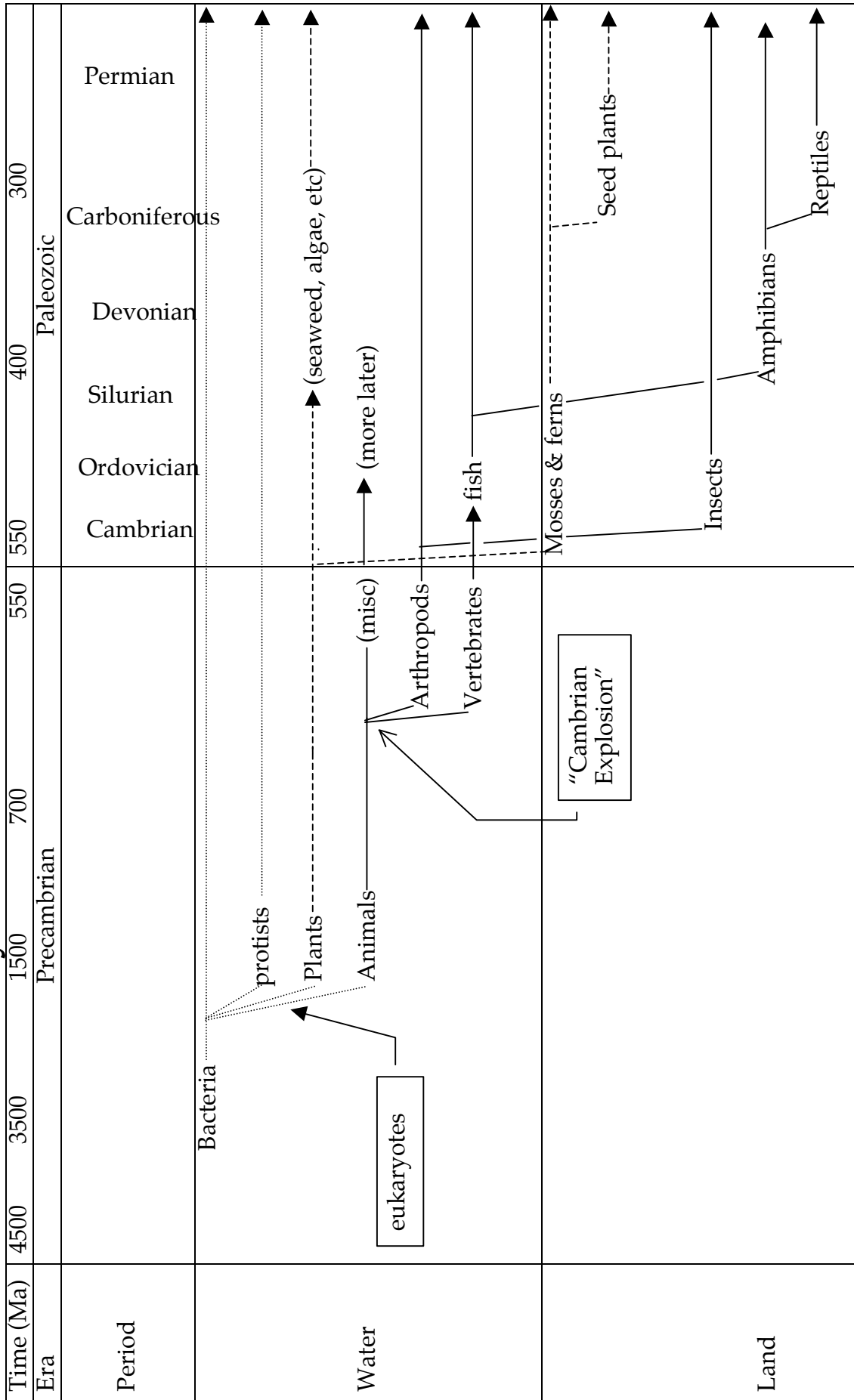
- 1 Mya = 1 Million years ago

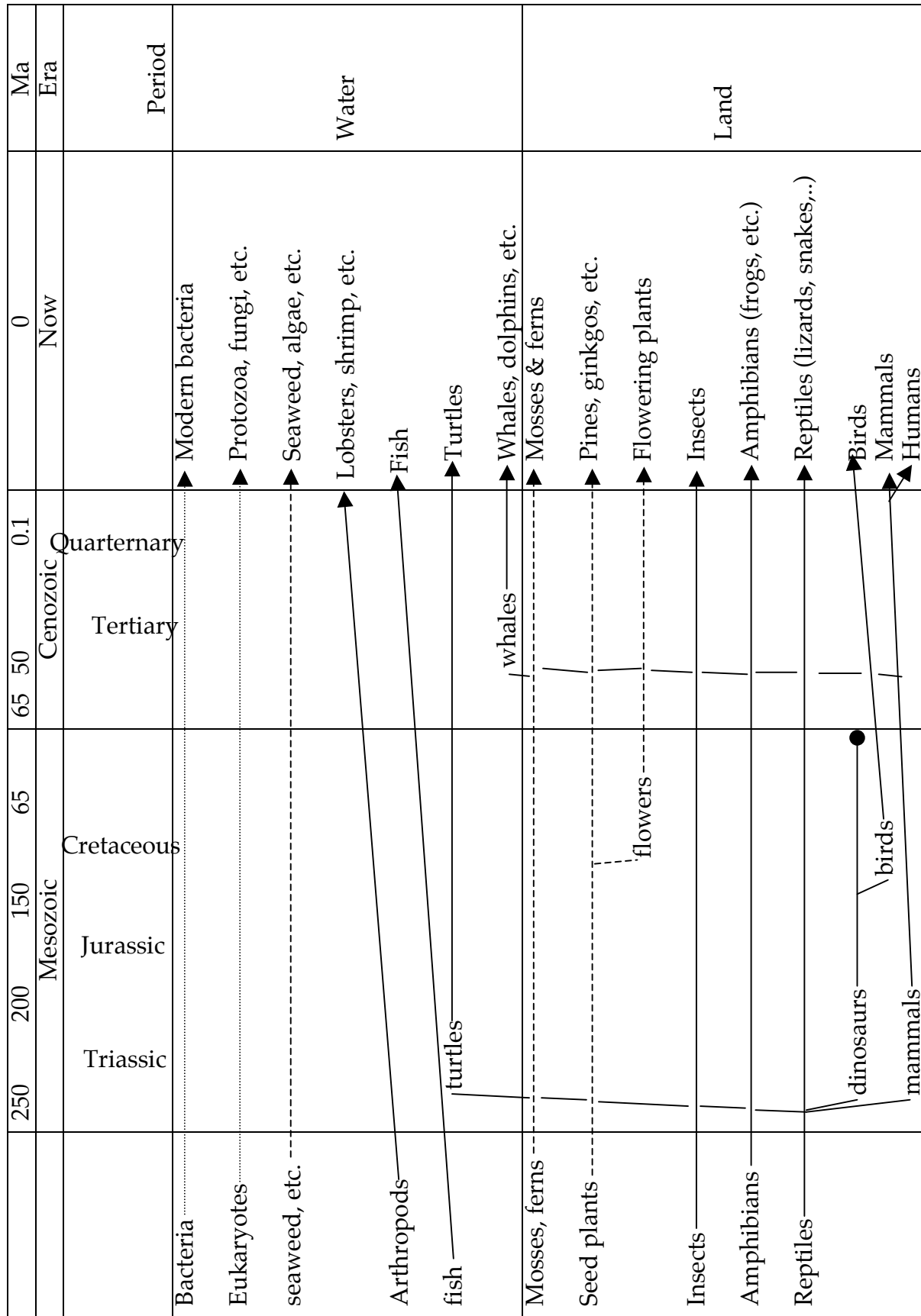
The Environment:



Evolution 8 - 2

Bio 112 Earth History II

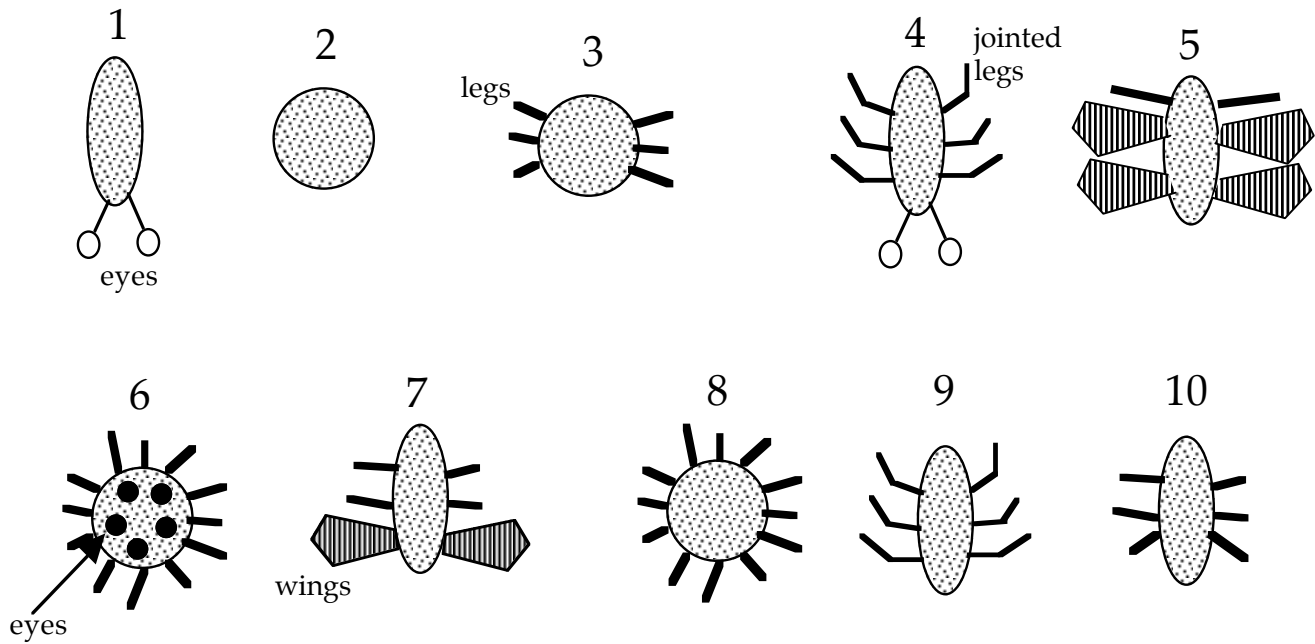




Evolution 8 - 4



Bio 112 Phylogeny Demonstration Problem



Other info:

- in a layer of rock that is 600 million years old, you only find type 2.
- in a layer of rock 200 million years old, you find 4, 5, and 6 but not 1.

Suppose you found these fossil creatures on Mars. What might you conjecture about their evolutionary history?

Evolution 8 - 6

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Bio 112: "Tree thinking" handout

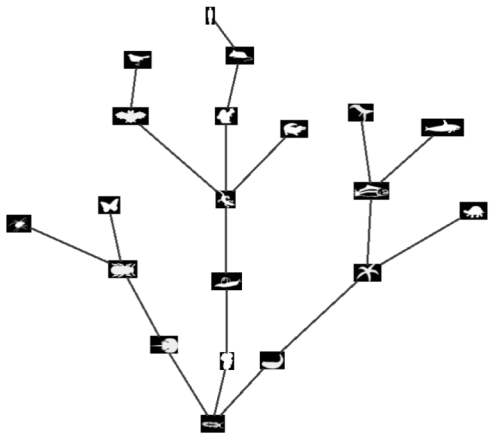
Comments on your responses to the "Diversity of Life Survey":

Important features that all trees must have:

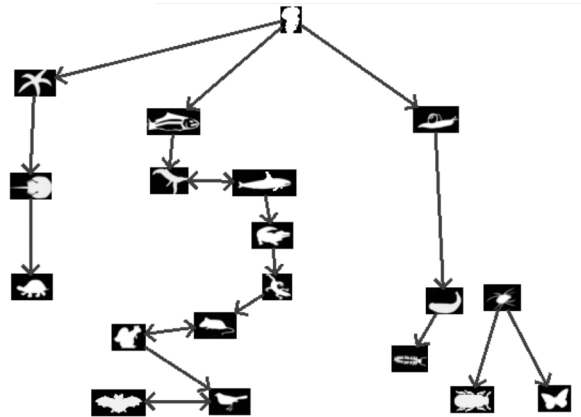
1. Since the tree shows the passage of time from left to right, *extant (currently living) organisms must be at the ends of branches.*
2. Since some organisms fall into groups and these groups have groups within them, *the tree should be hierarchical.*
3. Since all organisms descended from a common ancestor, *the tree should have only one root.*
4. Since humans evolved from animal ancestors, *humans should be part of the tree.*

Some sample Trees:

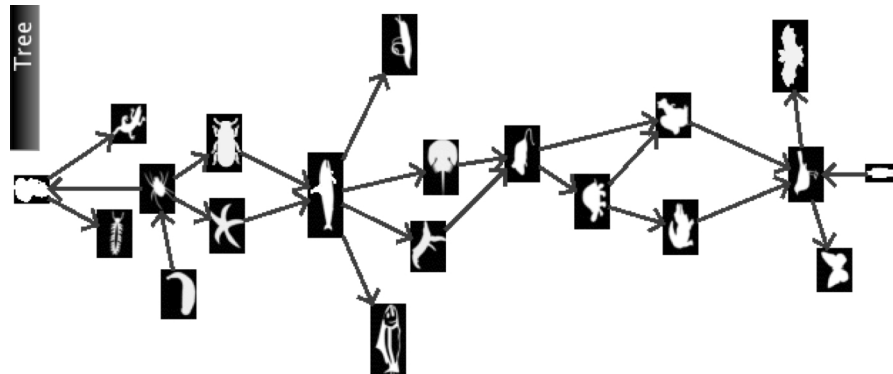
1)



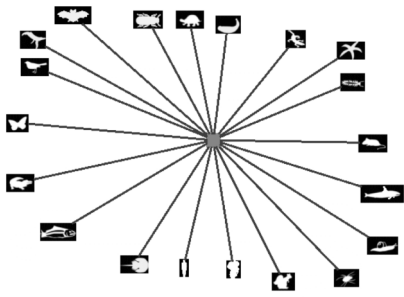
2)



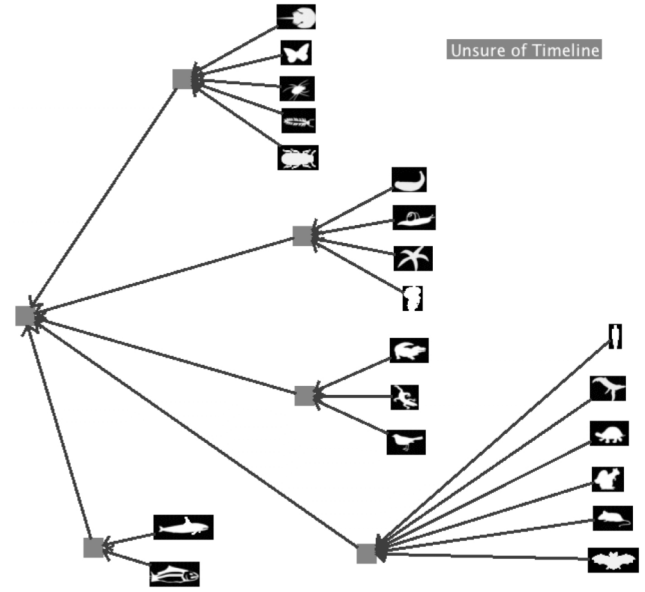
3)



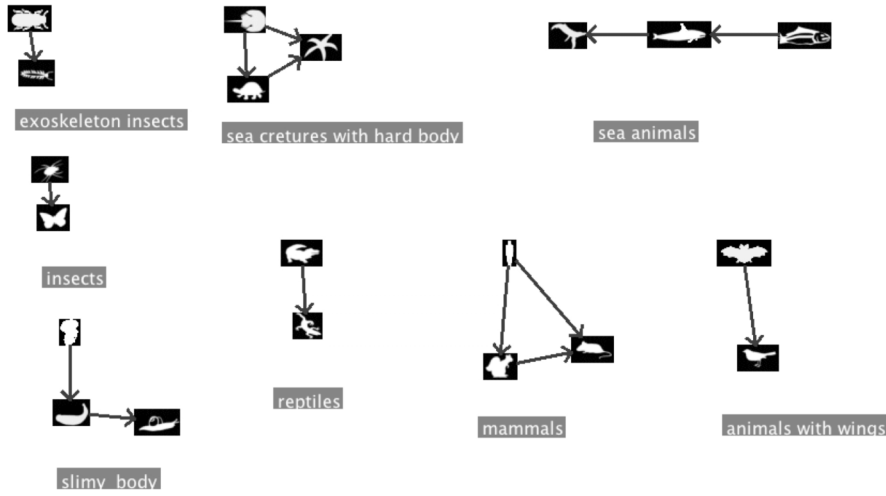
4)



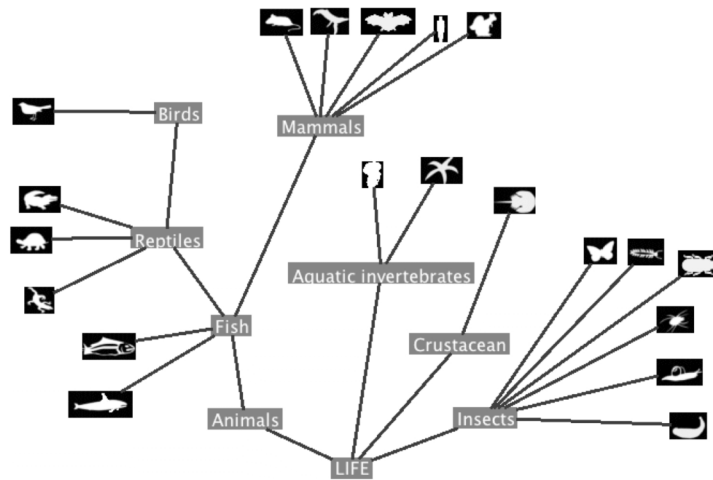
5)



6)

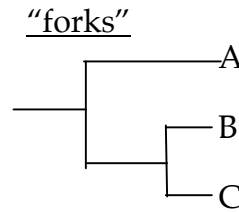
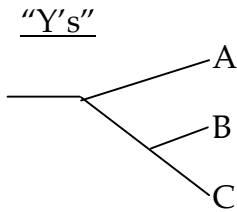


7)

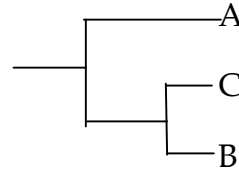
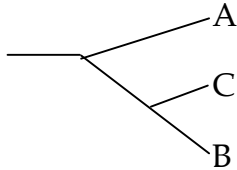


Other notes:

a) There are two equivalent ways to show a tree, but they can be confusing:



In both: the top-to bottom order does not matter. These are equivalent trees:



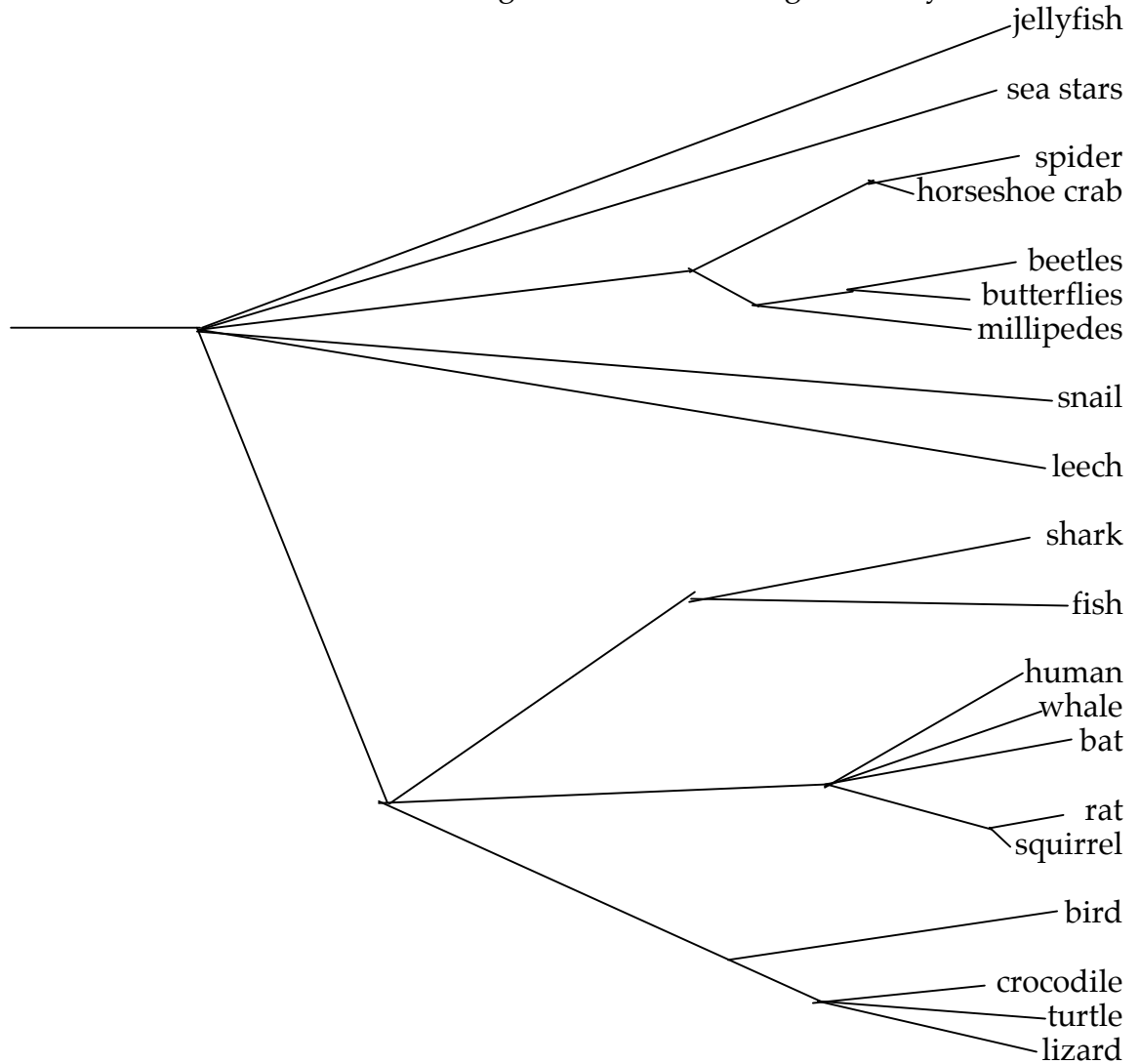
There are differences between the two representations:

Here, the "evolutionary distances" are measured as though you drove a car from A to B and measured the road miles of the entire trip.

Here, the "evolutionary distances" are measured only horizontally. The vertical spacing is meaningless.

The most correct answer to the survey is:

- note that, while the branches are correct, the lengths of the connecting lines may not be.



Here is the complete tree for the “Martian organisms”:

