**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 6**

**Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period\_\_\_\_\_\_\_\_**

**7.5.2 Evolutionary Trees**

**Introduction:** The fossil record cannot accurately determine when one species becomes another species (speciation). One hypothesis suggests that abrupt mutations in a few genes occur after a species has existed for a long period of time (Punctuated Equilibrium). This mutation results in the entire species shifting to a new species**.** The other hypothesissuggests that a slow, steady accumulation of small genetic changes add up to many changes and new species develop (Gradualism). Most evolutionary biologists accept that a combination of the two models has affected the evolution of species over time.

**Materials:** per group: one geologic time scale and one set of paper fossils

**Procedure:**

1. The group of "fossils" are imaginary animals but similar to the ancient trilobites. Each fossil on your sheet is marked with a time period and a letter to identify it.

2. Use the picture to help describe the fossils:

3. Arrange the fossils alphabetically and set them aside--eventually you will put them on the timeline, but NOT YET! The term "upper" means more recent and should be placed higher on the row. The term "lower" means an earlier time period, fossils from a "lower" time period should be placed toward the bottom.

So time periods may have more than one fossil, some may not have any.

4. You will place the fossils on the sheet in the order they were “discovered”. Answer the questions as you go.  **Be careful not to bump/move the fossils on the timeline.**

**START:**

5. Place **fossils A, E and O** in their proper location. Write at least 3 observations about the three fossils. At this point, what might scientists **infer** about the evolution of this organism?

|  |  |
| --- | --- |
| Observations: | Inference: |

6. Add **fossil F**. Write two more observations. Now what inferences might scientists make?

|  |  |
| --- | --- |
| Observations: | Inference: |

7. Now add **fossils Q, S, T, L and M**. What may have happened to the species during the Nevadian time period?

8. **Add fossils P, V, N and I**. How sure are you of your answer to #7? **Explain**

9. Add the remaining letters to the evolutionary tree and **show Mrs. Allred.** When you have discussed it, **tape the fossils** to the paper and **draw a line** **using a dry erase marker** connecting fossils in each branch of the tree.

10. What may have happened in the Montanian Period to organisms like Fossil L?



11. Examine the fossil that was unearthed in a museum, apparently the labels and other information were lost. Using your fossil record, determine the time period

that this fossil is **likely** from.

12. Of the two major species that arose from the parent species, which was more successful? Use evidence to support your answer.

13. For each of the "blanks" on your fossil record make a sketch of what the animal ***would*** look like. Draw them here.

14. Did one of the species go extinct? Explain.

**15. Conclusion:**  How does evidence from the fossil record support the **existence, diversity, extinction, and change of life forms** throughout the history of life on Earth? (fill the space provided)

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