

1.C-D Formatives

1. Fossils of lobe-finned fishes, which are ancestors of amphibians, are found in rocks that are at least 380 million years old. Fossils of the oldest amphibian like vertebrate animals with true legs and lungs are found in rocks that are approximately 363 million years old.

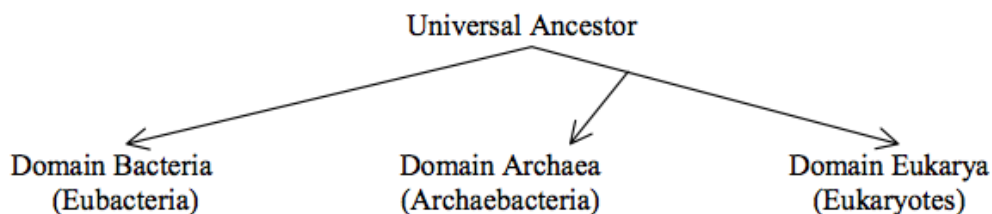
Three samples of rocks are available that might contain fossils of transitional species found between lobe-finned fishes and amphibians: one rock sample that is 350 million years old, one that is 370 million years old, and one that is 390 million years old.

Describe two pieces of evidence provided by fossils of a transitional species that would support a hypothesis that amphibians evolved from lobe-finned fishes.

2. Biologists are interested in preserving the diversity of living organisms on the planet.

- (a) Explain polyploidy, using an appropriate example.
- (b) Explain the growth of the human population, using an appropriate example.
- (c) For each process or phenomena above, discuss its impact on the diversity of life on earth.

3. Scientists recently have proposed a reorganization of the phylogenetic system of classification to include the domain, a new taxonomic category higher (more inclusive) than the kingdom category, as shown in the diagram below.



- (a) Describe how this classification system scheme presents different conclusions about the relationships among living organisms than those presented by the previous five-kingdom system of classification.
- (b) Describe three kinds of evidence that were used to develop the taxonomic scheme above, and explain how this evidence was used. The evidence may be structural, physiological, molecular, and/or genetic.

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4. Charles Darwin proposed that evolution by natural selection was the basis for the difference that he saw in similar organisms as he traveled and collected specimens in South America and on the Galapagos Islands.

(a) Outline the theory of evolution by natural selection as presented by Darwin.

(b) Each of the following below relates to an aspect of evolution by natural selection. Explain each of the following:

(i) Speciation and Isolation

(ii) Convergent Evolution