AP Bio FRQ Fridays

2013 #3
Fossils & Evidence of Evolution

FRQ Friday #21

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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 a transitional species 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.

(a) **Select** the most appropriate sample of rocks in which to search for a transitional species between lobe-finned fishes and amphibians. **Justify** your selection.

- Selection: Rocks from 370 MYA sample.
- Justification: Transitional fossils are found between 380 MYA (when lobe-finned fishes lived) and 363 MYA (when amphibians appeared) OR between different strata/layers in the correct order.

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(a) **Select** the most appropriate sample of rocks in which to search for a transitional species between lobe-finned fishes and amphibians. **Justify** your selection.

- Selection: Rocks from 370 MYA sample.
- Justification: Transitional fossils are found between 380 MYA (when lobe-finned fishes lived) and 363 MYA (when amphibians appeared) OR between different strata/layers in the correct order.

(A) Sample 2 which is 370 million years old is most appropriate for a trasitional species. This is proven by the sample being 370 million yrs old which is right between the lobe-finned fishes which are 380 million yrs old and the amphibians which is 363 millions years old. So sample 2 was just in the middle of transitioning to an amphibian.

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(b) **Describe** TWO pieces of evidence provided by fossils of a transitional species that would support a hypothesis that amphibians evolved from lobe-finned fishes.

Descriptions include but are not limited to the following:

- Bones OR specific skeletal structures

  legs /limbs/digits
  vertebrae
  flat skulls
  (interlocking) ribs
  flexible neck

- Scales
- Teeth
- Other homologous structures
- Has traits of both the lobe-finned fish and the amphibian
- Finding the transitional fossils in the same area/same environment as either the lobe-finned fish or the amphibian
- Molecular (DNA) evidence

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(b) **Describe** TWO pieces of evidence provided by fossils of a transitional species that would support a hypothesis that amphibians evolved from lobe-finned fishes.

(B) Location of the fossils can support the hypothesis because if they are near each that shows that they evolved from the same thing. And structures of the fossils show that amphibians evolved from lobe-finned fishes because their body structure is similar and they have similar organelles.