

## Evolution essays 2010:

EVOLUTION QUESTION 1981: L. PETERSON/AP BIOLOGY

Define, discuss, and given an example of how each of the following isolating mechanisms contributes to speciation in organisms.

- A. Geographical barriers
- B. Ecological (including seasonal) isolation
- C. Behavioral isolation
- D. Polyploidy

EVOLUTION QUESTION - 1984 L. PETERSON/AP BIOLOGY

Describe the modern theory of evolution and discuss how it is supported by evidence from two of the following three areas:

- a. Population genetics
- b. Molecular biology
- c. Comparative anatomy and embryology

EVOLUTION QUESTION - 1989 L. PETERSON/AP BIOLOGY

**\*\* If I use this question on your test I will change the problem.**

Do the following with reference to the Hardy-Weinberg model.

1. Indicate the conditions under which allelic frequencies ( $p$  and  $q$ ) remain constant from one generation to the next.
2. Calculate, showing all work, the frequencies of the alleles and the frequencies of **the genotypes** in a population of 15,783 rabbits, of which 3,946 are white and 11,837 are agouti. (In rabbits the white color is due to a recessive allele,  $w$ , and agouti is due to a dominant allele,  $W$ .)
3. If the homozygous dominant condition were to become lethal, what would happen to the allelic and genotypic frequencies in the rabbit population after two generations?

EVOLUTION QUESTION 1992: L.PETERSON/AP BIOLOGY

Evolution is one of the unifying concepts of modern biology.

- a. Explain the mechanisms that lead to evolutionary change.
- b. Describe how scientists use each of the following as evidence for evolution.
  - (1) Bacterial resistance to antibiotics
  - (2) Comparative biochemistry
  - (3) The fossil record

1994:

Genetic variation is the raw material for evolution.

- a. Explain three cellular and/or molecular mechanisms that introduce variation into the gene pool of a plant or animal population.
  
- b. Explain the evolutionary mechanisms that can change the composition of the gene pool.

1964:

On the archipelago of the Galapagos Islands, which most geologists believe to be of volcanic origin without ever having had any land connection with the west coast of South America, Darwin discovered a group of small finches. These birds have since been classified into more than a dozen species. These birds have differences, particularly in their adaptations for food-getting. It is believed that all these species are descendants of a single species which migrated from the mainland. On the mainland there has never been more than a single species even though the rate of mutations is thought to be the same in both locations.

Explain how each of the following could have played a role in the development of the many species of Galapagos finches:

- a. polyploidy
- b. genetic drift
- c. geographic isolation
- d. unoccupied ecologic niches
- e. Explain why the mainland species has not differentiated into more than one species.