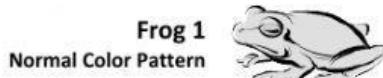


## Homework: Natural Selection and Adaptations

Answer the following questions about natural selection using your notes.



1. The diagram above shows two frogs from the same species. A mutation created a new allele that results in spots on the back as seen in frog 2. Which of the factors below will have the greatest effect on whether or not the frequency of this gene increases in the population?

**A** it is a more elaborate coloration      **C** it increases the pigment in certain cells  
**B** it increases the rate of survival      **D** it does not attract more females

2. Silent mutations create changes to genes that do not affect the phenotypes of organisms.

Why would natural selection **not** affect the frequency of a gene for fur color that has undergone a silent mutation?

**A** Natural selection only acts on phenotypes created by point mutations  
**B** This mutation does not affect the ability of the organism to survive  
**C** Changes to nucleotide sequences in cells producing fur are resistant to mutations  
**D** The process of natural selection does not affect any changes to fur color

3. Which of the following is a mutation that could be passed on to an organism's offspring?

**A** Mutation to the DNA of gamete cells  
**B** Mutation to skin cells from exposure to sunlight  
**C** Mutation to DNA in the cytoplasm of cheek cells  
**D** Mutation to hair pigment cells with permanent dyes

4. Mutations which produce better adaptations occur within a population –

**A** because they would help      **C** more often than harmful mutations  
**B** when they are most needed      **D** according to random chance

5. When a beneficial allele is produced that allows an organism to survive and reproduce, which of the following is most likely to occur?

**A** The rate at which mutations occur will decrease  
**B** The frequency of the allele will increase in the population  
**C** The number of chromosomes in the species will be reduced  
**D** The carrying capacity of the population will drastically increase

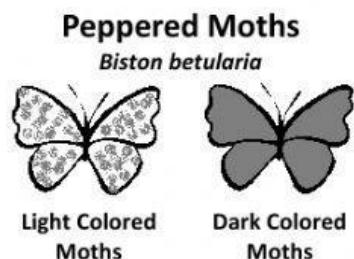
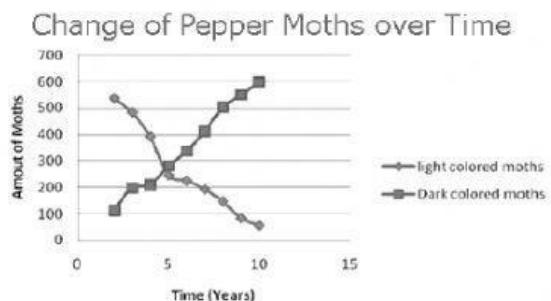
6. Which of the following is most likely to change as a direct result of natural selection?

**A** populations      **B** tissues      **C** cells      **D** organisms

7. When two populations become separated and live in different environments, the genetic variations within the populations will increase. This is likely because each population –

**A** changes the way it uses its forelimbs      **C** becomes adapted to different niches  
**B** faces an drastic increase in predation      **D** develops a new method of reproduction

8. Does natural selection change *individuals* or *populations*? \_\_\_\_\_

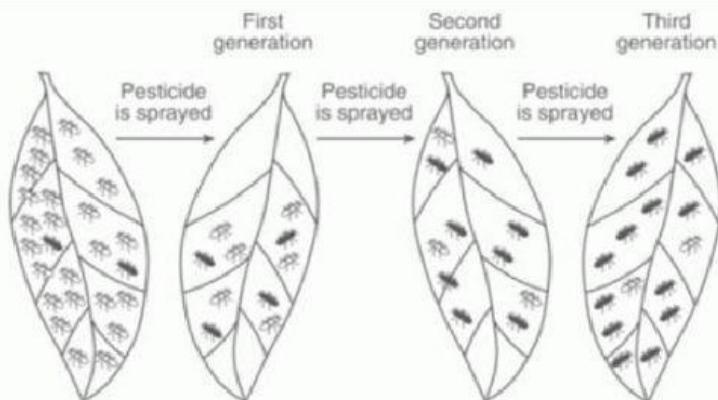


9. The graph above shows the changes in frequency that occurred in the color pattern of moths over time. The changes in the population of moths that occurred were most likely due to –

**A** individual moths changing color to blend in better with the environment.  
**B** new conditions that altered which phenotype was more likely to survive and reproduce.  
**C** a viral infection that only affects the reproductive system of dark colored moths.  
**D** the migration of other moth populations into the forest community.

10. The pollution produced during the Industrial Revolution had a huge impact on the frequency of genes found in the peppered moth (*Biston betularia*) population. Environmental changes of this scope often lead to the extinction of species, but the peppered moths were able to survive because the population contained –

**A** genetic diversity      **B** very few members      **C** carnivores      **D** multiple species



11. This pesticide was originally highly effective, but over time this pesticide has become much less effective as depicted in the illustration above. What is the main reason that this pesticide is not as effective as it was originally?

**A** An increase in precipitation caused the pesticide to be less effective.  
**B** Insects that were resistant to the pesticide survived and reproduced.  
**C** The number of predators in this community decreased over time.  
**D** A reduction in the number of producers affected the insect population.

12. Certain species of bacteria that cause the disease pneumonia are no longer responsive to certain antibiotic treatments. People with these strains often have a more difficult time overcoming the illness. This is because these bacteria have developed –

**A** hidden colonies within the patient      **C** resistance to the antibiotics  
**B** nuclei within each of their cells      **D** new ways to infect other organs