

Applied Practice

***Natural Selection***  
***STAAR Biology EOC***

**RESOURCE GUIDE**

**Volume 12**

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**APPLIED PRACTICE**  
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**STAAR Biology EOC**

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# Student Practices

## ***Natural Selection***



**Choose the best answer to each question.**

1 All of the following are examples of changes due to natural selection except —

- A a bacteria colony developing resistance to antibiotics
  - B a chameleon changing its coloration to match its environment
  - C a species of insects developing pesticide resistance
  - D the fur color in a population of mice changing from white to black over several generations
- 

2 A mutation that gives an organism in a species an advantage, such as immunity to a disease, would not be considered evolution unless —

- F the mutation could be passed to the organism's offspring
  - G over a long period of time, all of the organisms of the species acquired that same trait through random inheritance of genes
  - H over a short period of time, all of the organisms of the species acquired the same mutation
  - J none of the above
- 

3 Which of the following would not be an example of evolution through natural selection?

- A Male peacocks grow large elaborate tail feathers during the peacocks' mating season, which makes them more susceptible to predators.
- B Two populations of mice of the same species that live in different environments exhibit different coat colorations that match their surroundings.
- C The coats of house cats become thicker in the winter months and thinner in summer months.
- D The average beak size of a population of finches increases after a period of drought kills off plants that produce small, soft seeds.

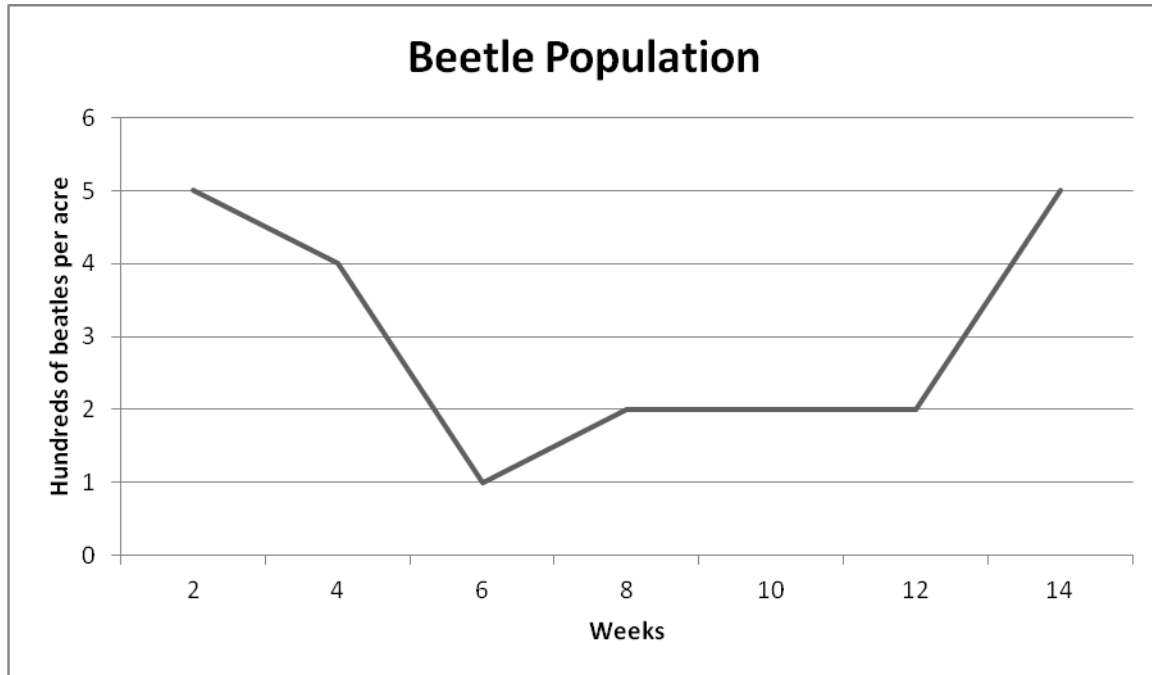
- 4 Resistance to pesticides has evolved in a number of pest species primarily because —
- F individuals within a pest species acquire immunity to the pesticide through mutations in each generation
  - G individuals that have a natural resistance to the pesticide survive and reproduce, passing their resistance on to the next generation and the population as a whole
  - H the surviving individuals learn not to eat food or drink water contaminated with the pesticides
  - J the pesticides become part of the food chain, and individuals learn how to metabolize the toxins before they can build up and lead to death
- 

- 5 Peacock hens choose their mating partners based on the quality of their mate's tail plumage. Males with large, elaborate, colorful tail feathers mate more often than males with smaller, simpler, less colorful plumages. These larger tail plumages, however, make the males slower and easier for predators to catch. Despite their drawbacks, larger, more elaborate tail feathers continue to exist in populations of peacocks. This is true because —
- A female peacocks only mate with the large tail feather males
  - B the genes for tail feathers mutate within individuals in each generation to produce the larger, more elaborate varieties
  - C predators choose to eat the males with the smaller tail feathers first because they are easier to identify
  - D males with the largest, most elaborate tail feathers have more opportunity to mate, thus passing on their genes to future generations



**Use the chart and information below to answer questions 6-8.**

A farmer's fields became infested with a beetle population that began to destroy his crops. He began to spray his fields weekly with a pesticide that the local hardware store owner said would take care of the beetles. The results of the weekly counts of the beetle population over a series of 3 months are shown in the graph below.



- 6 Which statement best explains why some of the beetles survived after the start of spraying?
- F Some beetles were adapted to the climate change that occurred over the several-month period of spraying.
  - G All of the beetles contained DNA unique to the species.
  - H The spraying of the pesticide represented a change in the environment to which all adult beetles were adapted.
  - J A natural variation existed within the beetle population.

- 7 Which statement best explains the decreased effectiveness of the pesticide?
- A The pesticide caused gene mutations that resulted in a resistance in some beetles.
  - B The pesticide reacted chemically with the DNA of the beetle and was destroyed.
  - C Beetles resistant to the pesticide lived and produced offspring with a similar resistance.
  - D All of the beetles produced antibodies that provided immunity to the pesticide.
- 

- 8 What can be concluded about individuals in the beetle population after the 14 weeks of pesticide spraying?
- F The new beetle population has evolved a resistance to the pesticide, and most individuals within the population will no longer die when exposed to it.
  - G Individuals in the beetle population are the same as they were before the spraying.
  - H An individual beetle's immunity to the pesticide will disappear once the farmer stops using the pesticide on his crops.
  - J None of the above
- 

- 9 In order for evolution to occur, there must be a change in the —
- A climate of the environment
  - B genes of an individual in a population
  - C genetic makeup of an entire population
  - D rate of succession in the environment