

Select the letter of the best answer below.

1. Which best describes selective advantage?

2. Which best describes selective pressure?

3. Which of the following is an example of mimicry?

4. Which of the following is an example of natural selection?

5. What is an end product of natural selection?

6. Based on the peppered moths' example, what do you expect occurs in moths that rest on birch trees (light-coloured bark) in a polluted environment that darkens the tree trunks?



Figure 7.1 (A) Camouflage allows this stick insect (*Eurycnema goliath*) to blend in with its environment and avoid being eaten by predators. (B) Many owls such as this barn owl (*Tyto alba*) can sneak up on their prey because of another adaptation: fluffy feathers make their flight quite silent.

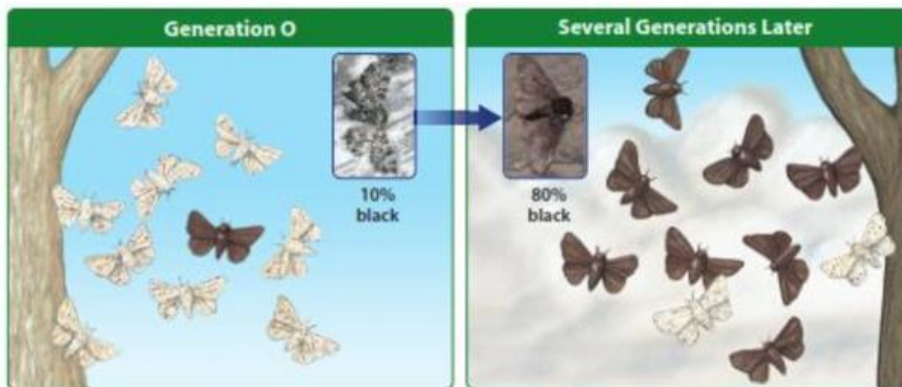


Figure 7.3 The proportion of flecked and black moths in this population of peppered moths changed in response to changes in the environment.

Infer What type of adaptation do the peppered moths exhibit? Explain your answer.

7. What term describes the relative contribution an individual makes to the next generation by producing offspring that will survive long enough to reproduce?

8. What is the source of new alleles in a species?

9. Which of the following best describes natural selection?

10. Ptarmigans are grouse-like birds that live in the far North. What adaptation is exhibited by white coloured Alpine ptarmigans that live in a snowy environment?



11. Identify the term that involves people using selective breeding techniques to increase the number of animals and plants with desirable traits.

Read this!

In Chapter 4, you learned about selective breeding technologies used to improve the genetic quality of farm animals. Selective breeding is a form of **artificial selection**. Selective breeding and artificial selection are a type of biotechnology. **Biotechnology** is the use of technology and organisms to produce useful products. Artificial selection has had a large impact on human survival. Most of the food we eat—grains, fruits, vegetables, meat, and milk—comes from species that have been selectively bred.

12. Within a few weeks of patients using the drug streptomycin for a *Staphylococcus aureus* infection, a patient's *Staphylococcus aureus* population consists primarily of *Staphylococcus aureus*-resistant bacteria. How can this result be explained?



Figure 7.6 These *Staphylococcus aureus* bacteria appear to be identical, but some may have a mutation that makes them resistant to antibiotics.

13. Which of the following statements is true?

14. What does “variation is neutral” mean?

15. Which two factors add to variation in a population?

16. What is a mutation?

17. Natural selection acts upon which of the following?

18. Which of the following best describes selective pressure?

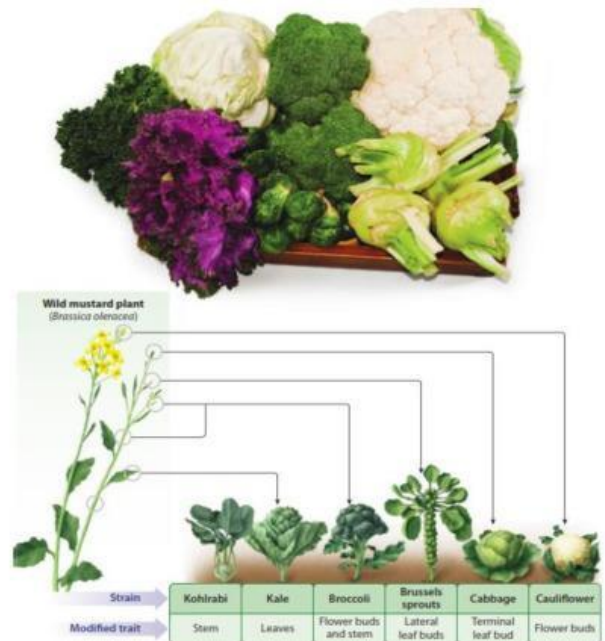
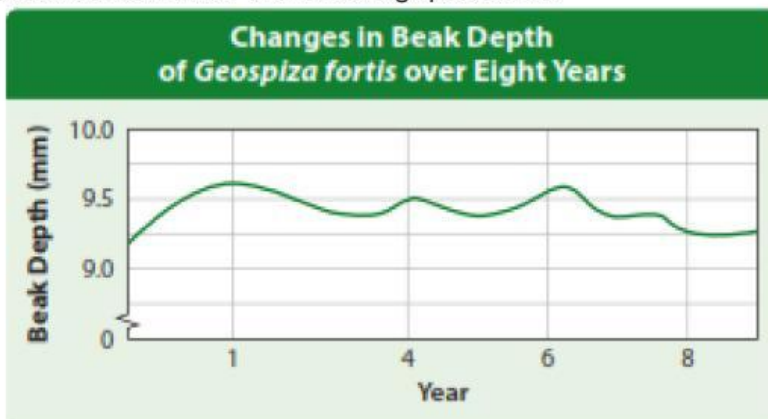


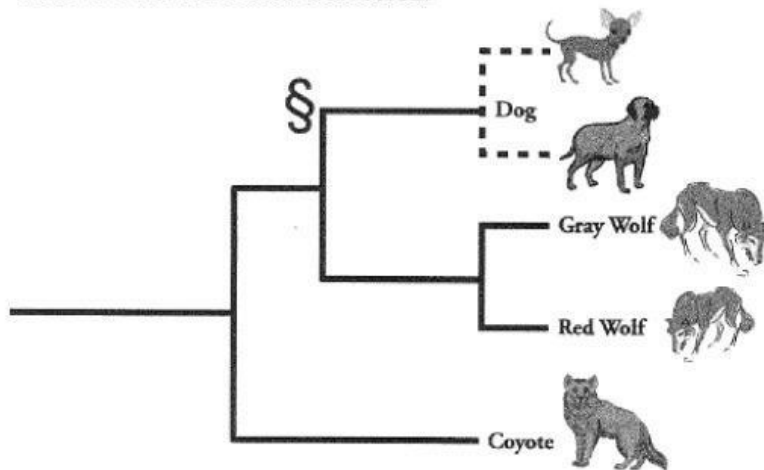
Figure 7.9 These six agricultural plants look very different from each other, but they carry much of the same genetic material as the wild mustard plant. The differences between them affect the formation of flowers, buds, stems, and leaves.

19. The medium ground finches (*Geospiza fortis*) of the Galapagos Islands use their strong beaks to crush seeds. They prefer the small seeds that are abundant during wet years. During dry years, fewer small seeds are produced. Therefore, the finches also have to eat larger seeds, which are more difficult to crush. Researchers have been measuring the depth (dimension from top to bottom) of the finches' beaks, which relates to strength. The deeper the beak, the stronger it is. Refer to the graph below and answer the following questions.



- a. Years 1, 4, and 6 were drought years. Year 8 was wet. What do you notice about the average beak depth in the finch population during dry years compared with wet years? Choose the best answer.
- b. How do the data relate to selective pressure and natural selection? Choose the best answer.

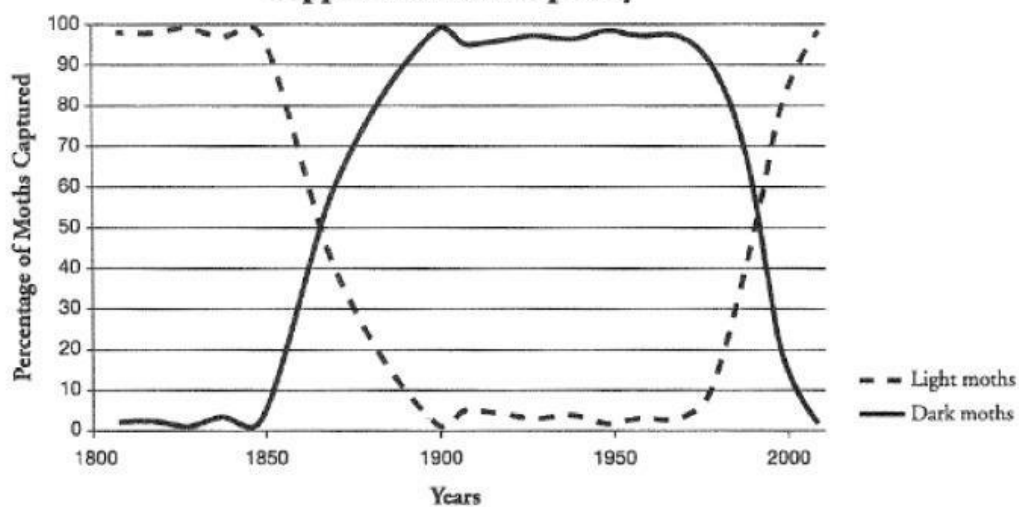
Natural vs. Artificial Selection



20. a. How does the diagram above indicate that all three types of organisms came from a common ancestor?
- b. According to the diagram, wolves are more closely related to what other group? Why?

Color Variations in Moths in Great Britain

Peppered Moth Frequency



21. a Which moth colour was prevalent in 1850?

c. Which coloured moth was prevalent between 1900 to 1950?



Figure 7.4 The kittens in this litter have different fur colour and patterns, partly because each kitten inherited a different combination of alleles from its parents.