Name: _____ Date: _____ Per. _____

Patterns & Mechanisms of Evolution

Vocabulary Review: Define the following terms

1. stabilizing selection_____

_____

2. directional selection _____

_____

3. disruptive selection _____

_____

Multiple Choice: Circle the correct answer for each of the questions below.

4. Starlings produce an average of five eggs in each clutch. If there are more than five, the parents cannot adequately feed the young. If there are fewer than five, predators may destroy the entire clutch. This is an example of
   - a. disruptive selection.
   - b. stabilizing selection.
   - c. directional selection.
   - d. none of the above.

5. The occurrence of large or small beak sizes among seed crackers in the absence of medium-sized beaks is an example of
   - a. directional selection.
   - b. stabilizing selection.
   - c. disruptive selection.
   - d. none of the above.

6. A scientist measures the circumference of acorns in a population of oak trees and discovers that the most common circumference is 2 cm. What would you expect the most common circumference(s) to be after 10 generations of stabilizing selection?
   - a. 2 cm
   - b. greater than 2 cm or less than 2 cm
   - c. greater than 2 cm and less than 2 cm
   - d. can't tell from the information given

7. Refer to question 6, but this time answer what you would expect after 10 generations of disruptive selection.
    a. 2 cm
    b. greater than 2 cm or less than 2 cm
    c. greater than 2 cm and less than 2 cm
    d. can't tell from the information given

8. Refer to question 6, but this time answer what you would expect after 10 generations of directional selection.
   a. 2 cm
    b. greater than 2 cm or less than 2 cm
    c. greater than 2 cm and less than 2 cm
    d. can't tell from the information given
.

Short Answer: Answer the following questions in complete sentences.

9. What types of individuals in a population are represented by the two ends of a bell curve?

10. If a cow develops a preference for eating white four o'clock flowers and ignoring pink and red four o'clock flowers, what type of selection is being demonstrated? Sketch a graph of the curve with labeled axis to demonstrate the selection.

11. Label the three types of selection illustrated by the graphs below.

a_____   b_____   c_____
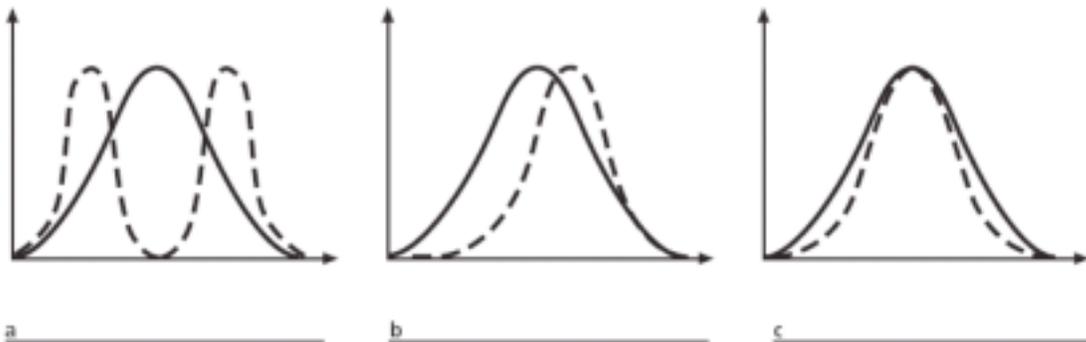
Interpreting Data: Use the following information to answer the questions below.

12. A population of birds, with various size beaks, eats seeds. Small seeds can be eaten by birds with small beaks. Larger, thicker seeds can only be eaten by birds with larger, thicker beaks. Suppose there is a shortage of small seeds but that there are still many large seeds.

a. Draw a new curve on the graph below to show how the distribution of beak sizes might change as a result of selection in this new environment.

of
individuals
with a trait

Original
population

Quantification of trait
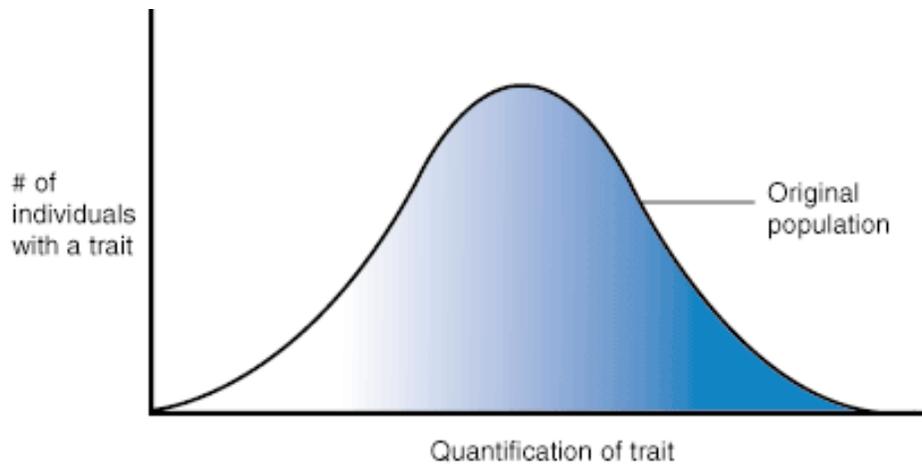
Use the graph above to answer the following questions:

b. Which birds in this population have the highest fitness?

c. Explain how natural selection could lead to the change you predicted.

Graphing: Use the information below to make a graph.

13. For your study, you will be examining a specific population of spiny cacti, which is originally in genetic equilibrium. A road is built quite close to the study site, which keeps away the treacherous and parasitic insects, but with the road comes the tourists.

In many desert areas of the United States, passing cactus lovers like to pick up a souvenir cactus to take home with them after a day-trip out into the desert. This is a serious problem in some areas because the tourists always take the better looking cacti, and these happen to be the ones with the middle-spine-numbers.

Years of collecting have left their toll on the roadside cacti. Using this background knowledge and the data collected below; create a graph of both the original population of cacti and the current population on a piece of graph paper. Remember to label your x and y axis and give your graph a title.

What type of selection does this graph represent?_____

Original Population		Current Population (Yrs later)	
Number of Cactus	Number of Spines	Number of cactus	Number of Spines
4	71	10	72
12	82	22	80
25	95	5	93
13	106	12	108
8	113	14	110
4	122	9	120
2	130	4	129