Biology I: Macaw Book
Unit III: Evolution
Chapters 16, 17, 19: Evolution
Practice: Evolution and Natural Selection

Name: _____

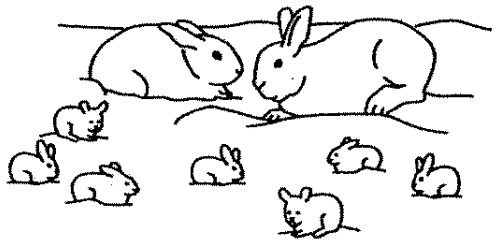
Date: _____ Hour: ____

Study the Pictures

Evolution by natural selection can be summarized in four statements.

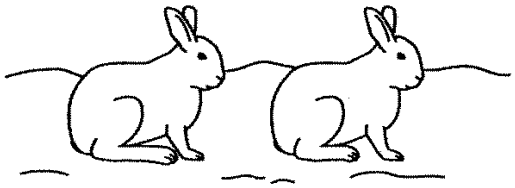
Variation exists within a population.
Some variations are more advantageous for survival and reproduction than others.
Organisms produce more offspring than can survive.
Over time, offspring of survivors will make up a larger portion of the population.

Write the statement from the box that best matches each of the situations shown.



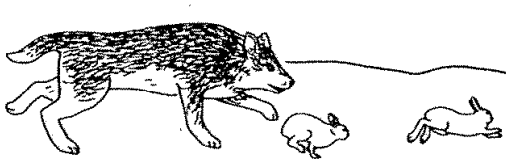
Snowshoe rabbits produce many offspring.

1. _____
_____
_____



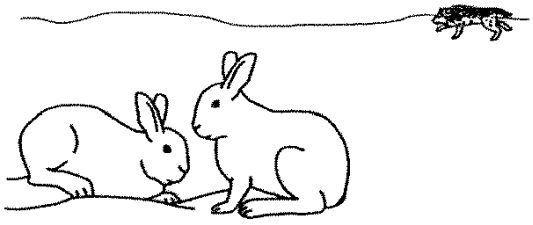
The back feet of some snowshoe rabbits are larger than the back feet of outer snowshoe rabbits.

3. _____
_____
_____



Snowshoe rabbits with large back feet can run across snow faster than those with small back feet and escape predators, such as wolves more often.

2. _____
_____
_____

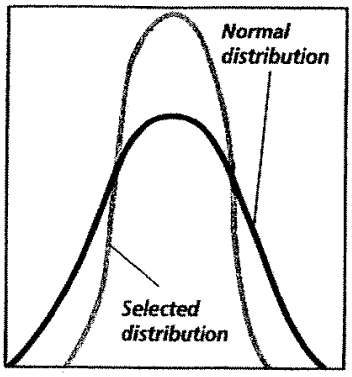


More snowshoe rabbits with larger feet survive in the population and reproduce.

4. _____
_____
_____

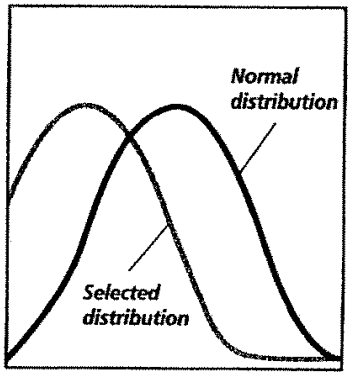
Study the Graphs

Each graph compares the normal distribution of a characteristic in the original population with the distribution of the characteristics in a population altered by natural selection.



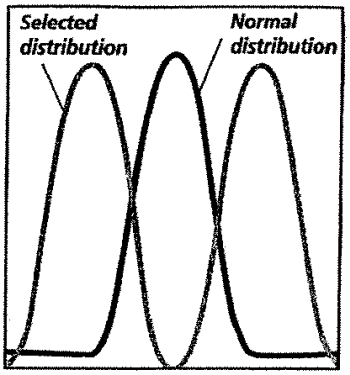
Graph A

More individuals in the altered population have the average value of the characteristic than in the original population.



Graph B

The distribution of the characteristic in the altered population differs from the distribution of the characteristic in the original population.



Graph C

Two altered populations appear—each having a distribution of a characteristic distinct from the characteristic of the original population.

In the space at the left, write the letter of the graph that illustrates the type of natural selection described.

_____5. Directional selection: natural selection that results in a regular change in a population in one direction

_____6. Disruptive selection: natural selection that results in two separate populations that have distinct characteristics

_____7. Stabilizing selection: natural selection that favors the average individuals in a population

In the space at the left, write the letter of the graph that illustrates each of the following.

_____8. A large valley is flooded and a population of lizards is divided into two smaller populations that can no longer interbreed.

_____9. A population of penicillin-resistant bacteria develops from a population of bacteria (some of which were resistant to penicillin), which was treated with penicillin.

_____10. In a large population of grass plants, variation in the height of grass decreases over time.

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Practice: Natural Selection and Allele Frequency

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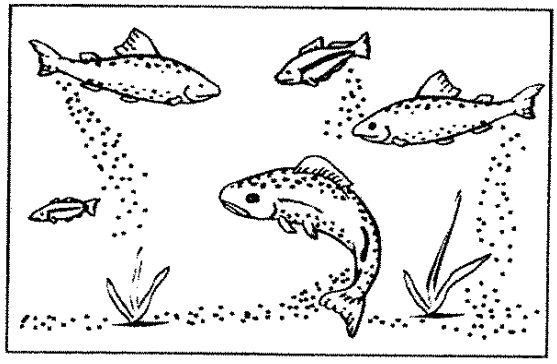
Study the diagrams

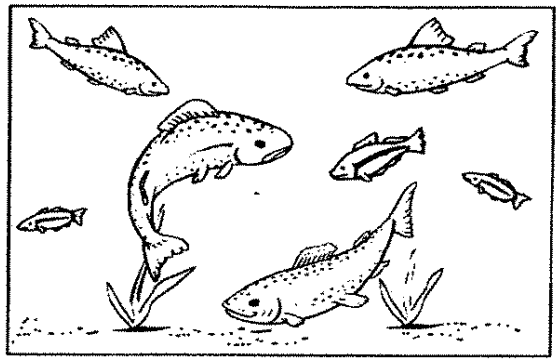
Then answer the questions that follow.

1.



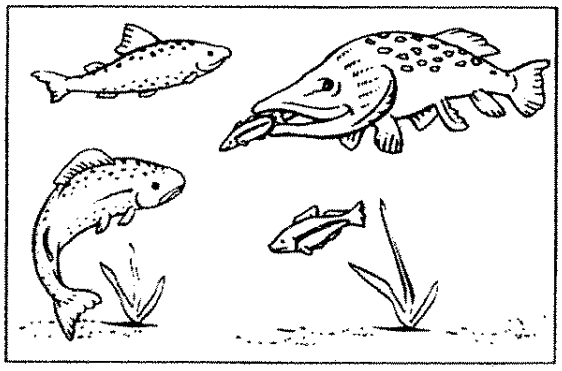
In nature, many animals overproduce offspring.

2.



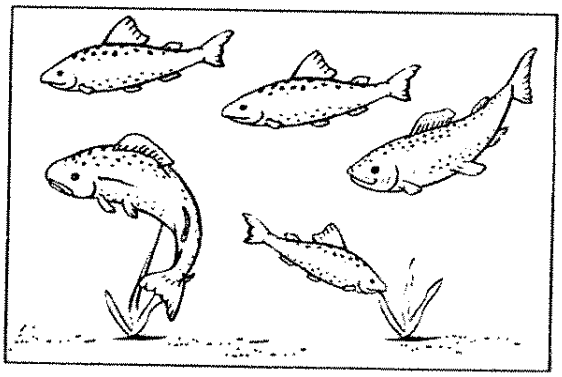
Members of a population have a variety of traits. These fishes differ in size and speed.

3.



Fishes that are slow and small usually get eaten by predators. Faster, larger fishes can get away from predators.

4.



Offspring of surviving fishes make up a larger part of the new population.

1. Why is a fast fish more likely to survive than a slow fish?

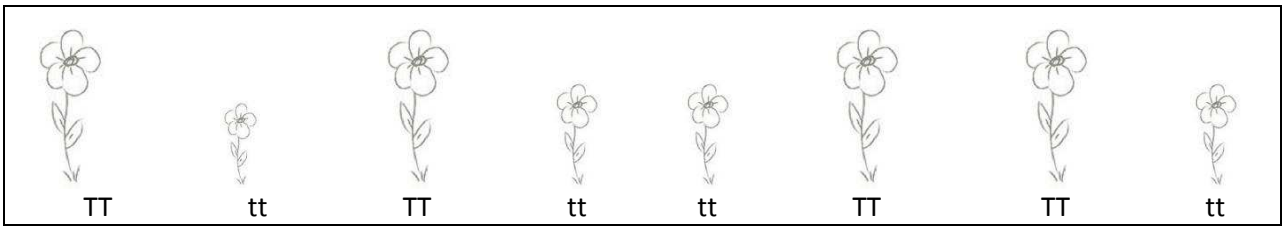
   _____

   _____

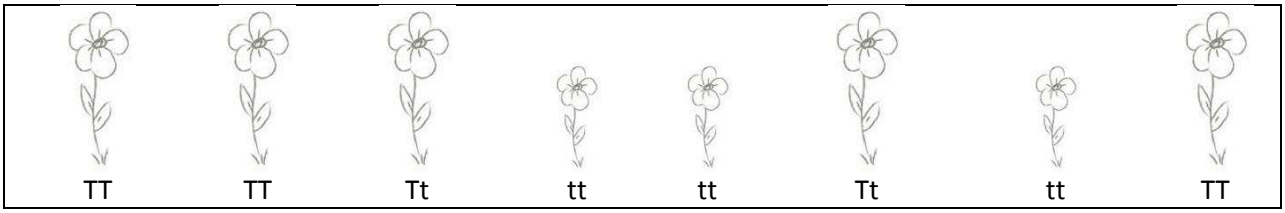
2. **True or False.** Natural selection happens when traits that help an organism survive are passed from generation to generation. _____

Study the diagrams for the following flower population. Then answer the questions that follow.

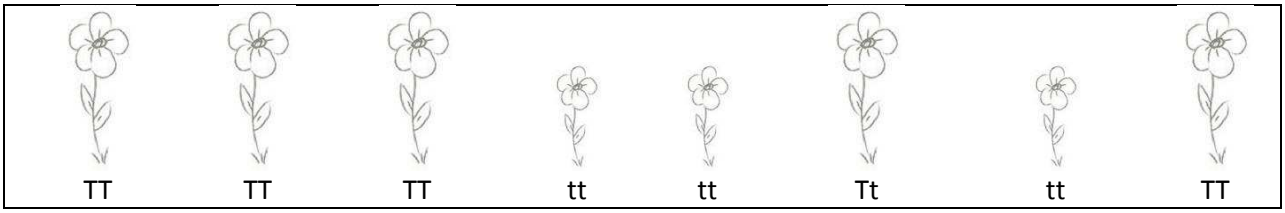
First Generation



Second Generation



Third Generation



1. For each generation, calculate a) phenotype frequency, and b) allele frequency. Complete the following table.

Generation	Genotypes Present	Alelle Frequency	Phenotype Frequency
First			
Second			
Third			

2. Has evolution occurred between the first and second generations? Explain your answer.

3. Has evolution occurred between the second and third generations? Explain your answer.