

1 **Chapter 11 The Evolution of Populations**

11.1 Genetic Variation within Populations

I. Genetic variation in a population increases the chance that some individuals will survive-

A. Natural selection acts on different phenotypes that results from genetic variation in a population.

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1. The gene pool is all of the genes and different alleles that are in a population.
2. The allele frequency is a measure of how common a certain allele is in a population.

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B. Evolution is any change in the relative frequency of alleles in a population

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Q1. Evolution acts on ___ in a population.

1. genotypes
2. phenotypes
3. alleles

Q2. We know evolution is occurring in population if the relative frequency of ___ is changing in the population.

1. genotypes
2. phenotypes
3. alleles

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II. Genetic variation comes from several sources-

- A. Mutations – random changes in DNA can form new alleles
- B. Recombination – new allele combinations occur during meiosis as gametes are formed
- C. Hybridization – the breeding of two different, but related species

6

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11.2 Natural Selection in Populations

I. Natural selection acts on distribution of traits

- A. Within a population there is a normal distribution of traits. Ex: human height

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II. Natural selection can change the distribution of a trait in one of three ways-

- A. Microevolution is the observable change in allele frequencies of a population over time.

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- B. Directional selection occurs when individuals at one end are more fit than everyone else and the range of phenotypes shift.

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- C. Stabilizing selection occurs when individuals in the middle have a higher fitness, narrowing the range of phenotypes.

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- D. Disruptive selection favors those individuals at the ends, acting against those in the middle and creating two distinct phenotypes.

- 11 **Categorize the following scenarios as directional selection, stabilizing selection, disruptive selection or no change.**

Be prepared to share your answer!

1. The legs of cheetahs have increased in length from their ancestors to better capture their prey.
2. Average birth weight of human babies is between 5.5 and 10 pounds with the mean being about 7.5 pounds.
3. Peppered moths commonly have both a dark and a light color variation, but few medium color variations because they live on trees with patches of light colored lichen on dark bark.
4. Great white sharks have been on average 11-17 feet long for the last 5 million years.
5. Bacteria are becoming more resistant to antibiotics.
6. The average clutch size for chickens is about 6 to 9 eggs.