

## MICROEVOLUTION

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### CAUSES OF MICROEVOLUTION


## QUESTIONS:

1. Use the key provided to identify the microevolution cause described in each of the following.

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|----------------------|----------------------|
| A. Bottleneck effect | D. Mutation          |
| B. Founder effect    | E. Nonrandom mating  |
| C. Gene flow         | F. Natural selection |

\_\_\_\_\_ Changes in the gene pool of a small population due to random chance

\_\_\_\_\_ Examples of genetic drift

\_\_\_\_\_ Much of the population is wiped out by a natural disaster; the allele frequency of the population is determined by a small surviving population

\_\_\_\_\_ A few individuals colonize a new habitat; genetic drift in a new colony

\_\_\_\_\_ Change in the gene pool of a population due to the migration of fertile individuals or the transfer of gametes between populations

\_\_\_\_\_ The introduction of new alleles

\_\_\_\_\_ Mates not chosen randomly; sexual selection

\_\_\_\_\_ Differential reproductive success; some phenotypes selected against; individuals best adapted to the environment survive to reproduce and pass their genes onto the next generation

\_\_\_\_\_ The appearance of blue M&Ms in a population of red and green M&Ms

\_\_\_\_\_ A few birds separate from the rest of the flock, fly to a new area, and establish a new colony

\_\_\_\_\_ At the end of the last ice age, cheetahs almost became extinct – only a few survived.

\_\_\_\_\_ Only a small number of flies survives a harsh winter.

\_\_\_\_\_ Female flies prefer to mate with white-eyed males

\_\_\_\_\_ Pollen from one field of seed corn is blown across the county to another field of seed corn.

2. Is all variation within a population heritable? Explain.

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3. The phenotypic expression of a trait is dependent upon 2 factors. List them.

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4. Match the description / example with the correct term. Use the key provided to indicate your answers.

A. Polymorphism  
C. Cline

B. Geographical variation

\_\_\_\_\_ The height of asters decreases as the altitude on a mountainside increases

\_\_\_\_\_ One species of king snakes exist in several different varieties with the population

\_\_\_\_\_ ABO blood groups in humans

\_\_\_\_\_ 2 or more morphs are present in a population in noticeable frequencies

\_\_\_\_\_ Differences between populations in their frequencies of alleles

\_\_\_\_\_ Presence or absence of freckles in humans

\_\_\_\_\_ Subpopulations within a population

\_\_\_\_\_ Could result from localized inbreeding in a "patchy" environment

\_\_\_\_\_ Type of geographical variation that is a graded change in a trait along a geographic transect

5. What are the sources of genetic variation within a population?

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6. Which source of genetic variation produces the greatest variety?

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Explain why this is true. \_\_\_\_\_

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7. If natural selection tends to reduce variation, then how is variation preserved within the population?

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8. If sickle-cell anemia is so destructive, why hasn't the sickle-cell allele been eliminated from the population?

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9. What are neutral variations? \_\_\_\_\_

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How is the frequency of neutral alleles affected by natural selection?

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10. Adaptive evolution is the blend of what two factors?

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11. "Survival of the fittest" is defined in terms of reproductive success not just in terms of survival. Why?

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12. Why does selection act faster against a harmful dominant allele than a harmful recessive allele.

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13. Selection acts directly on \_\_\_\_\_ and indirectly on \_\_\_\_\_.

14. Explain why the connection between phenotype and genotype is not simple.

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15. Use the key below to identify the mode of natural selection described / represented by each of the following:

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|---------------------------|--------------------------|
| A. Stabilizing selection  | B. Directional selection |
| C. Diversifying selection | D. Sexual selection      |

\_\_\_\_\_ acts against the extremes

\_\_\_\_\_ favors both extremes

\_\_\_\_\_ favors one of the extremes

\_\_\_\_\_ favors the intermediate

\_\_\_\_\_ reduces the intermediate

\_\_\_\_\_ reduces phenotypic variation

\_\_\_\_\_ females select males that are showier, more colorful, etc. for mating

\_\_\_\_\_ a plant population is found in an area that is becoming more arid;  
the average surface area of the leaves had been decreasing  
over generations

\_\_\_\_\_ female chickens prefer to mate with roosters with large, red combs

\_\_\_\_\_ as the trees in central and southeastern England became covered with dark pollutants, the dark variety of the peppered moth became more abundant

\_\_\_\_\_ Average-sized seeds become more common; the birds that eat the seeds become more specialized with around the same (average) size beak length

\_\_\_\_\_ Larger seeds become more common; the bird population evolves larger beaks

\_\_\_\_\_ Average-sized seeds become less common and larger and smaller seeds become more common; the bird population splits into 2 subgroups specializing in eating larger and smaller seeds.

\_\_\_\_\_ Human infants have the best chance of surviving the trials of birth if they weigh between 7 and 8 pounds at birth; mortality is higher at higher or lower birth weights.

16. What is sexual selection? \_\_\_\_\_

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Why are sexual adaptations often at odds with other adaptations?

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17. Why doesn't evolution produce perfect organisms?

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