

Evolution Study Guide:

1. What is the biological definition of evolution?

The process by which species change over time.

Scientists:

2. Who was Charles Lyell and what did he think?

A geologist that thought changes over time were gradual and took A LONG TIME.

3. Who was Charles Darwin and what did he think?

Charles Darwin is known as the father of evolution and started the ideas about natural selection and survival of the fittest.

4. What did Jean Lamarck think and why was it wrong?

An evolutionary scientist that thought traits that were acquired during a lifetime could be passed on and would be passed on based on use or disuse.

Evidence for Evolution:

5. What does Biochemistry compare and how does it show evolution?

Biochemistry compares genes, DNA, proteins, and amino acids and helps us to understand relationships and explain common ancestors.

6. What are homologous structures? Give an example.

Homologous Structures are similar in structure (built the same) but have different functions. The arm of a human, whale, and bat.

7. What are analogous structures? Give an example.

Analogous structures have similar functions but different structures. The wings of a bird, bat, and butterfly.

8. What does the fossil record show?

Fossil record show us change over long periods of time and help to explain what environmental pressures caused certain traits to better suited for a specific area.

9. What are vestigial structures? Give an example.

Vestigial structures are parts that are no longer needed by the organism. Wisdom teeth, appendix, etc.

Natural Selection:

10. What is natural selection? Give an example.

Those individuals that are better suited for the environment will survive and reproduce. Black mice on black rocks.

11. What has to be true for natural selection to occur?

Sexual reproduction must occur, genetic variation must be present, and traits must be inherited.

12. What does fitness mean?

An individual is more likely to survive AND reproduce

13. What are alleles and how do they relate to natural selection?

Alleles are a form of a gene (piece of DNA) and their frequencies change over time allowing for different traits to be better.

14. What is diversity and variation and how do they relate to natural selection?

Diversity and variation mean differences and they both allow changes to make species less vulnerable to disease/predation.

15. What is directional selection? Give an example. Draw the graph

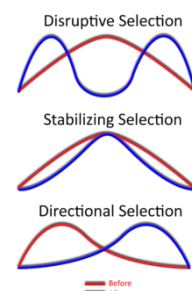
When ONE extreme phenotype is selected for. Antibiotic resistance in bacteria.

16. What is stabilizing selection? Give an example. Draw the graph

When the intermediate phenotype is selected for. Medium tail length.

17. What is disruptive selection? Give an example. Draw the graph

When BOTH extreme phenotypes are selected for. Black and White mice.



Mechanisms for Evolution

18. What do mutations bring to a population? What happens to bad/harmful mutations?

Mutations are the ONLY way for brand new traits to appear in a population. Some mutations are positive, some negative, and some neutral.

19. How does migration cause evolution?

Allows alleles to travel BETWEEN populations.

20. What is genetic drift?

Accounts for random changes in the allele frequency.

Speciation:

21. What is the definition of a species?

A group of individuals that can interbreed and produce fertile offspring.

22. What is speciation?

The development of a new species from an existing species.

23. What is reproductive isolation?

A reproductive barrier that forces two populations to no longer be able to interbreed.

24. What is geographic isolation?

A physical barrier that causes separation between two populations that can no longer interbreed.

Sexual Selection

25. Why would a female choose a particular male?

For its fitness and traits, and the likelihood that her young will survive

26. What are 2 disadvantages to sexual reproduction?

Only get to pass on 50% of your genes and it takes time and energy.

Macroevolution:

27. What is the difference between gradualism and punctuated equilibrium?

Gradualism says speciation happens over a long period of time. Punctuated equilibrium says that after a long time of no change, sudden environmental pressures cause species to appear.

Adaptation:

28. What is an adaptation?

An INHERITED characteristic that makes an individual better suited for its environment and more likely to reproduce.

29. The statement "animals adapt to their environment" is FALSE, how could you make it TRUE?

Animals are already adapted (born with it) and therefore better for an environment