**EVOLUTION Quiz review 2025™**

Be sure to review all the diagrams in the worksheets assigned. You will see many of these images on your quiz.

| | Topic | MHR text 2010 |
|---|---|---|
| 1 | **Introduction to Theory of Evolution**<br>Evolution, microevolution, macroevolution<br>**Activity**: **Evolution Timeline, Why Does Evolution Matter Now (TB bacteria)**<br>● **Activity – Phylogenetic trees,** watch videos for this lesson | |
| 2 | **Fossil Evidence for Evolution**<br>- 3 key features of fossil evidence, 4 fossilization processes, transitional fossils, vestigial structures<br>**Worksheets with videos - Tiktaalik WS,** watch videos for this lesson<br>● *Fossil evidence worksheets: part 1, part 2, part 3* | 332-335 |
| 3 | **More evidence for evolution**<br>- biogeography, anatomy, homologous and analogous structures, embryology, molecular biology, DNA, genes, proteins, amino acid sequences **watch the videos for this lesson**<br>● **Evidence for Evol'n:*part 1, part 2, part 3***<br>● worksheets | 335-338 |
| 4 | **Adaptations**<br>Structural (anatomical, mimicry, cryptic colouration), homologous and analogous structural adaptations, behavioural and physiological adaptations, genetic fitness, extinction<br>● Adaptations ws, watch all the videos for this lesson<br>● ***#4 Adaptation: Adaptations ws, part two*** | 296-301,304 |
| 5 | **Mechanisms of Microevolution 1 - Natural Selection, sexual selection and mutations**<br>- review of genetics terms genotype vs phenotype variation, mutation, allele frequencies<br>- natural selection, selective advantage, selective pressure<br>- stabilizing selection, directional selection, disruptive selection, sexual selection,<br>● Worksheets: *Sexual selection ws*<br>● *Natural selection ws* | 302-311<br>356- 359 |
| 6 | Microevolution 2 – More Mechanisms:Natural Selection, Mutations in gametes,Genetic Drift,Bottleneck Effect,Founder Effect, Gene Flow,Non-random Mating or Artificial Selection,In-breeding, Assortative mating<br>Changes in Gene flow worksheet and Founder Effect worksheet | |

**Some sample questions- look up your own answers**

1. Two individuals are unquestionably members of the same species if they**:**

a. possess the same number of chromosomes.
b. breed at the same time.
c. are phenotypically indistinguishable.
d. can mate and produce fertile offspring
e. all of the above.

2. New combinations of genes may be produced by:

a. hybridization
b. mutation
c. crossing over
d. sexual reproduction
e. all of the above

3. The theory of natural selection postulates that:

a. in each generation, individuals well adapted for their environment are more likely to live longer and tend to produce more progeny than the less well adapted individuals
b. the death of individuals occur completely at random with respect to their genotypes
c. the death of individuals occur completely at random with respect to their phenotypes
d. the survival and reproductive success of individuals depend to a limited extent upon their genetic adaptations to their environment e. most deaths of individual organisms occur soon after fertilization, as a result of hereditary deficiencies

4. When a bell shaped curve results from the analysis of some variable in a population, the type of natural selection that is probably occurring in the population with regard to that variable is**:**

a. disruptive
b. stabilizing
c. divergent
d. variable
e. directional

5. Four of the five answers listed below are characteristic of mutations Select the exception

a. predictable
b. lethal, beneficial or neutral
c. random
d. effects depend upon environment
e. heritable

6. The number of different alleles per gene in a natural population is most frequently:

a. one
b. two
c. many more than two
d. greater than two, but never greater than ten
e. none of the above

7. Natural selection can best be defined as:

a. the best-adapted individuals live to a very old age
b. differential reproduction
c. differential population-growth rates
d. enhanced survival of those individuals with favorable acquired phenotypic traits
e. the elimination of the weak by the strong

8. Which of the following is NOT correct with respect to natural selection and adaptation?

a. In a few generations, a population being subjected to natural selection should reach adaptive perfection
b. Since predators also evolve, their prey can never evolve perfect adaptations
c. The process of natural selection tends to remove the less fit, but sometimes even the least fit will survive and produce offspring
d. Natural selection acts on prey but never predators.
e. Two of the above choices are correct

9. The primary evolutionary unit is the:
a. individual
b. population
c. germ cell
d. gene
e. cell

10. When a farmer breeds only his or her best livestock, the process involved is
a. natural selection.
b. artificial selection.
c. artificial variation.
d. survival of the fittest.

11. Which statement about the members of a population that live long enough to reproduce is consistent with the theory of natural selection?
a. They transmit characteristics acquired by use and disuse to their offspring.
b. They tend to produce fewer offspring than others in the population.
c. They are the ones that are best adapted to survive in their environment.
d. They will perpetuate unfavorable changes in the species.

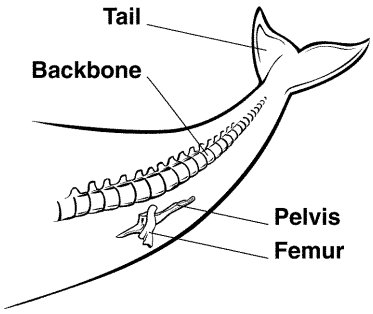


**Figure 15-1**

12. In humans, the pelvis and femur, or thigh bone, are involved in walking. In whales, the pelvis and femur, structures normally associated with walking, are shown in Figure 15-1 are
a. examples of fossils.
b. vestigial structures.
c. acquired traits.
d. examples of natural variation.

13. The same kinds of cells that grow in similar patterns in different but related organisms produce

a. homologous structures such as wings and arms.
b. the same kind of embryos.
c. natural variations in a population.
d. Analogous structures

.

14. Which of the following statements describe what all members of a population share?

a. They are temporally isolated from each other.
b. They are geographically isolated from each other.
c. They are members of the same species.
d. They have identical genes.

15. The combined genetic information of all members of a particular population is the population's

a. relative frequency.
b. phenotype.
c. genotype.
d. gene pool.

16. Which statement below about gene pools is typically true?

a. They contain two or more alleles for each inheritable trait.
b. They contain only dominant alleles.
c. They belong to two or more interbreeding species.
d. The relative frequencies of the alleles never change.

17. If an allele makes up one fourth of a population's alleles for a given trait, its relative frequency is

a. 100 percent.
b. 75 percent.
c. 25 percent.
d. 100 percent.

18. The gene shuffling that occurs as part of sexual reproduction

a. changes the gene pool's allele frequencies.
b. does not change the gene pool's allele frequencies.
c. keeps the phenotypes consistent.
d. is caused by radiation or chemicals.

19. Natural selection acts directly on

a. alleles.
b. genes.
c. phenotypes.
d. mutations.

20. When individuals at only one end of a bell curve of phenotype frequencies have high fitness, the result is

a. directional selection.
b. stabilizing selection.
c. disruptive selection.

d. genetic drift.

21. When individuals with an average form of a trait have the highest fitness, the result is
a. not predictable.
b. disruptive selection.
c. directional selection.
d. stabilizing selection.

22. The situation in which allele frequencies of a population remain constant is called
a. evolution.
b. genetic drift.
c. genetic equilibrium.
d. natural selection.

23. The allele frequencies of a population are more likely to remain unchanged if
a. the population size is reduced.
b. frequent movement into and out of the population occurs.
c. all mating is random.

24. Which process is occurring when female members of a species choose mates that possess a particular trait?
a. sexual isolation
b. sexual selection
c. stabilizing selection
d. directional selection
e. disruptive selection

26. Which term can be defined as any trait that enhances an organism's fitness or increases an organism's chance of survival and reproduction?
a. adaptation
b. speciation
c. radiation
d. natural selection
e. all of the above

**Short Answer**

1. Identify and describe any three pieces of evidence that support and explain the theory of evolution.

2.Referring to the following diagram, explain how embryological studies can provide evidence for the theory of evolution. Provide an example to support your reasoning.


3 The following table gives the femur length (the thigh bone measured from the hip to the knee joint) of eight individuals of one species of rabbit. Use the data to answer the following questions.

| Individual | Femur length (cm) |
|---|---|
| 1 | 9.5 |
| 2 | 13.0 |
| 3 | 14.0 |
| 4 | 12.8 |
| 5 | 6.4 |
| 6 | 14.2 |
| 7 | 5.5 |
| 8 | 11.9 |

a) What femur length (long or short) appears to be favoured? Explain your answer.

b) Assuming that a rabbit with a longer femur can jump farther, how might femur length be a factor in the survival of a rabbit?

c) How might these data provide evidence in support of natural selection? Explain your answer.

5. Explain the meaning of homologous, analogous and vestigial structures. Be sure to give an example of each.

6.What natural process must be stopped for fossilization to occur? [1]