Gene Mutation: Causes, Types, and Effects

Part I: Fill in the Blank

Word Bank:

DNA	mutation	radiation	inherited	substitution
deletion	insertion	proteins	harmful	beneficial

1. A change in the genetic material of an organism is called a _____.
2. Mutations can be caused by exposure to chemicals or _____.
3. A(n) _____ mutation occurs when one nucleotide is replaced by another.
4. A(n) _____ mutation occurs when an extra nucleotide is added to a DNA sequence.
5. A(n) _____ mutation occurs when a nucleotide is removed from a DNA sequence.
6. Mutations can affect the production of _____ in cells.
7. Some mutations can be _____ and help organisms survive better.
8. Other mutations can be _____ and cause diseases or disorders.
9. Mutations that are passed from parents to offspring are called _____ mutations.
10. Genes are made up of _____.

Part II: True or False

Write **T** for True or **F** for False.

11. _____ All mutations are harmful.
12. _____ Mutations can occur naturally during DNA replication.
13. _____ Radiation can increase the likelihood of mutations.
14. _____ A deletion mutation adds extra nucleotides to DNA.
15. _____ Some mutations have no noticeable effect on an organism.
16. _____ Gene mutations can affect how proteins are made.
17. _____ Mutations can only occur in plants.
18. _____ Beneficial mutations may help an organism adapt to its environment.
19. _____ Insertion mutations involve adding nucleotides to DNA.
20. _____ Mutations are changes in the DNA sequence.

LIVEWORKSHEETS

Part III: Multiple Choice

Circle the best answer.

21. What is a gene mutation?
    a. A type of cell division
    b. A change in a DNA sequence
    c. A protein made by cells
    d. A chromosome pair

22. Which of the following is a cause of mutations?
    a. Water
    b. Sunlight and radiation
    c. Gravity
    d. Oxygen

23. Which mutation occurs when one nucleotide is replaced by another?
    a. Deletion
    b. Insertion
    c. Substitution
    d. Duplication

24. What can mutations affect?
    a. Protein production
    b. Cell function
    c. Traits of an organism
    d. All of the above

25. Which mutation removes nucleotides from DNA?
    a. Deletion
    b. Insertion
    c. Substitution
    d. Replication

26. A mutation that helps an organism survive is considered:
    a. Harmful
    b. Neutral
    c. Beneficial
    d. Dangerous

27. Which of the following may result from a harmful mutation?
    a. Improved adaptation
    b. Genetic disorders
    c. Faster growth in all organisms
    d. Increased photosynthesis

28. What is the role of DNA in mutations?
    a. DNA is unchanged by mutations
    b. Mutations are changes in DNA
    c. DNA causes all diseases
    d. DNA is not involved

29. Which type of mutation adds extra nucleotides?
    a. Insertion
    b. Deletion
    c. Substitution
    d. Inversion

30. Some mutations are called neutral because they:
    a. Always cause disease
    b. Always help survival
    c. Have little or no effect on the organism
    d. Remove all proteins

LIVEWORKSHEETS