DNA, Heredity and Natural Selection:

DNA, Genes, Sexual Reproduction and Mutations

Practice:

1. What is DNA short for?

2. Where in your cells is most of your DNA found?

 A. Cytoplasm B. Mitichodria C. Ribosomes D. Nucleus

 E. Cell Wall F. Cell Membrane G. Golgi Body H. Endoplasmic Reticulum

3. Each DNA molecule is shaped like a long ladder that has been twisted into a spiral. This shape is known as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

4. A DNA molecule is made of many (tens or hundreds of millions) small pieces. Each of these pieces contains 3 parts. A phosphate, a sugar and a nitrogenous base. Each of these pieces is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

5. The backbones of the DNA (the 2 sides of the ladder) are made up of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

6. The rungs of the ladder, that join the two sides together, are made up of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

7. A DNA molecule has 4 possible nitrogenous bases. These are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

8. Write the rule for base pairing. (What base pairs with what base?)

9. The DNA in your body is broken into pieces. Human DNA is found in 46 pieces (23 pairs: 23 from your father, 23 from your mother). These pieces are coiled up into structures called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

10. A section of DNA that codes for a specific protein is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

11. Different versions of the same gene are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

12. How many nucleotides are in a typical gene? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. For each of the following sequences of bases along a single strand of DNA, write sequence of bases on the complementary DNA strand.

 a. GCA

 b. TTG

 c. TCA AAG

 d. TGG CGA ACT GTG CGT TAC

 e. CAA TCT GGG GAC TGG

 f. AAC CAA GGC ATC GAG TTT

14. What is the name of the enzyme that “unzips” the DNA double helix by breaking the hydrogen bonds between the bases?

15. What role do DNA polymerases play in DNA replication?

16. When does DNA replication usually occur?

17. What is RNA?

18. What are the 4 bases in RNA?

19. Give 4 differences between DNA and RNA.

20. What is DNA transcription?

21. For each of the following sequences of bases along a single strand of DNA, write sequence of bases on the corresponding strand of mRNA.

 a. TCG AGC GGA

 b. CGT TCC AAC

 c. CCG ACA TTG

22. What is DNA translation?

23. What is a mutagen?

24. What is a carcinogen?