

## Biol 12: DNA and Protein Synthesis Review

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### Review Questions:

1. Where are the genes found in a cell? Name the two biomolecules found in chromosomes.
2. List the 3 subunits of every nucleotide found in nucleic acid. What are the purine and pyrimidine bases?
3. The 2 \_\_\_\_\_ of DNA twist about one another to form a \_\_\_\_\_ helix with the 2 strands held together by \_\_\_\_\_ bonds between the purine and pyrimidine bases.
4. Which complementary bases pair together in DNA? How does the structure of unwound DNA compare to that of a ladder?
5. Complete the following table by comparing cellular DNA to cellular RNA:

|           | DNA | RNA |
|-----------|-----|-----|
| Function: |     |     |
| Sugar:    |     |     |
| Bases:    |     |     |
| Strands:  |     |     |
| Helix:    |     |     |
6. List the 3 basic functions that DNA, as a hereditary material, must be able to do.
7. What is the function of helicase and DNA polymerase? List the steps required in DNA replication.
8. Why is DNA replication said to be semiconservative? Which enzyme "proofreads" the replicated DNA?
9. What is the difference between transcription and translation?
10. Name the specific type of RNA that is used to produce the correct order of amino acids in a polypeptide.
11. How many bases are used in the genetic code? Is the genetic code a doublet or a triplet code?
12. Define a codon. How are the 3 different types of codons used?
13. Is the genetic code considered essentially universal?
14. During transcription, a segment of \_\_\_\_\_ unwinds and complementary \_\_\_\_\_ nucleotides pair with the DNA nucleotides of one strand. What enzyme is used to join the RNA nucleotides together?
15. Distinguish between introns and exons. What happens when mRNA is processed?
16. What is the function of transfer RNA? What is found at each end of the tRNA molecule?
17. What are the 2 types of molecules in each of the 2 subunits of a ribosome? Where is the rRNA produced? Where is the protein of the ribosomes produced? Where are the subunits assembled and then transferred?
18. What 3 processes are required for translation? The codon that stands for the amino acid \_\_\_\_\_ will begin the initiation of protein synthesis.
19. How many tRNA molecules will attach to a ribosome at one time?
20. The \_\_\_\_\_ of each tRNA is complementary to a particular codon in \_\_\_\_\_.
21. During translation, the order of mRNA codons determines the order in which \_\_\_\_\_ and their attached amino acids come to a ribosome to determine the sequence of amino acids in a polypeptide.