

Study Objectives

Unit 6: DNA and Protein Synthesis

Use this as a guideline for your upcoming test. Refer to your notebook, assigned text readings, and lab activities to review what was learned during this unit. After successfully completing the labs and classwork you should be able to answer thoroughly, providing relevant information, examples and diagrams if appropriate.

Chapter 13:

Structure and Function of DNA, DNA Replication

Chapter 14:

Structure and Function of RNA, Protein Synthesis, Gene Regulation and Mutations

1. Draw and label the structure, shape, and components of DNA. How is prokaryotic DNA different from eukaryotic DNA?
2. What contributions did Avery, Hershey/Chase, Franklin, Watson/Crick make to the understanding of the structure and function of DNA?
3. List the steps of DNA replication in eukaryotes and name the enzymes used.
4. What is the end product of DNA replication? What is the purpose of replication? What is meant by “semi conservative”?
5. List 4 differences between DNA and RNA.
6. Describe the three types of RNA and their function. How are they similar, how are they different?
7. What are the 2 main steps of protein synthesis? Summarize their functions/products, and the location where each takes place.
8. What enzymes are important in protein synthesis? What does each of these enzymes do?
9. Convert a DNA sequence such as ATTCGACGTACG into mRNA, and then into an amino acid chain (protein) using the chart in your book.
10. Draw and label what an anticodon and codon are. Which one is used to look up an amino acid in the chart?
11. Describe the difference between a point mutation and a frameshift mutation. Be able to identify substitutions, additions and deletions in DNA sequences and identify missense, nonsense, and silent mutations
12. Understand the interaction between genes and the environment. How do environmental factors affect gene expression and result in different phenotypes? What is the “epigenome”?