

Unit 4: Information Study Guide

GPS Standards

DNA, RNA, & Protein Synthesis (*SB2a, SB2b; Ch. 13*)

Mutations (*SB2d; Sec 14-1*)

DNA Technology (*SB2f; Ch. 15*)

Vocabulary: Hand write the definitions of the following terms

Ch13

1. Gene
2. DNA
3. Nucleotide
4. Double helix
5. Deoxyribose
6. DNA replication
7. RNA
8. Transcription
9. Translation
10. Codon
11. Anticodon
12. Messenger RNA
13. Transfer RNA
14. Ribosomal RNA

Ch14

15. Mutation
16. Point mutation
17. Frameshift mutation
18. Genome

Ch15

19. Human Genome Project
20. Gene therapy
21. DNA fingerprinting
22. Genetic engineering
23. Recombinant DNA
24. Genetically modified organisms
25. Clone
26. Stem cell
27. Restriction enzyme
28. Gel electrophoresis
29. Polymerase chain reaction

Questions: Answer the following questions on a SEPARATE SHEET OF PAPER

DNA Structure

1. What do DNA and RNA stand for?
2. What are the differences between DNA and RNA in terms of: location, function, sugars, base pair rules, number of sides/strands?
3. What are the 3 parts of a typical nucleotide?
4. What type of bond holds the 2 sides of DNA together?
5. When does a cell do DNA replication?
6. Explain the steps of DNA replication.

Protein Synthesis

7. What are transcription and translation?
8. Where does transcription and translation occur in the cell?
9. What are the **functions** of the 3 types of RNA?
10. What type of RNA has codons and what type of RNA has anticodons?
11. What are the steps of transcription? Be detailed
12. What are the steps of translation? Be detailed

*** Make sure you understand how to use the mRNA codon chart in the book to find the names of the amino acids ***

Mutations

13. What is a point mutation?
14. What causes a frame-shift mutation and what happens to the final amino acid sequence?
15. What is a substitution mutation and what happens to the final amino acid sequence?

DNA Technology

1. What is genetic engineering?
2. What is recombinant DNA technology and how is it used?
3. What are the steps of whole organism cloning?
4. What is gel electrophoresis and DNA fingerprinting?
5. In gel electrophoresis, why is the negatively charged lead closest to the DNA in the wells?
6. What are stem cells?
7. What are genetically modified organisms? Give 2 examples.
8. How is bioremediation beneficial to the environment?
9. What is gene therapy?
10. What is Polymerase Chain Reaction?