

*** USE **NOTES** AND BOOK AS NEEDED***

1. What does DNA stand for? _____
2. What are chromosomes?
3. Where in the cell are chromosomes located? _____
4. What two scientists established the structure of DNA? _____ and _____
5. DNA is sometimes described as a twisted ladder. What is this shape called? _____
6. Draw and label a nucleotide (3 main parts-see NOTES) (A simple diagram is sufficient)

7. What forms the backbone of DNA? _____ and _____
8. What forms the rungs of the ladder of DNA? _____
9. Write the names of the nitrogenous bases in pairs:
 _____ and _____
 _____ and _____
10. What does the word complementary mean?

11. Which nitrogen bases are complementary to each other?

12. Create a matching (complementary) DNA sequence for the following strand:



DNA Replication

13. What is DNA replication? Describe in your own words.

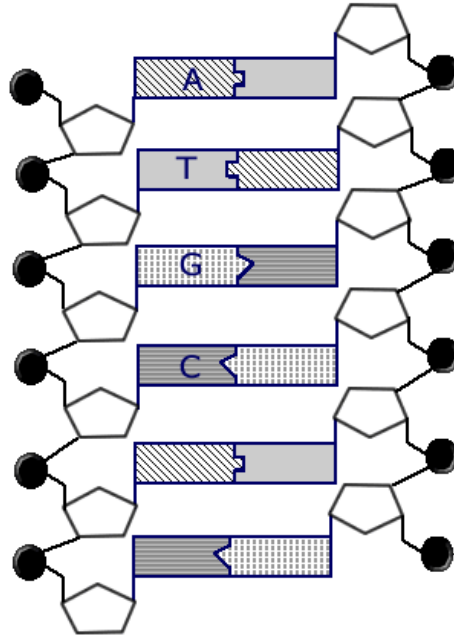
14. Why do cells need to perform DNA replication?

15. DNA must “unzip” to replicate. Describe how DNA “unzips”. Include the name of the enzyme involved.

16. What is the importance of DNA polymerase?

17. Study the diagram below. Fill in the missing nitrogen base letters. Then, label the parts of the diagram using the following word bank:

Phosphate	Nitrogen base pairs
Nucleotide	Deoxyribose Sugar



Protein Synthesis

18. What is transcription?

19. What is a gene?

20. Why can't DNA leave the nucleus?

21. What does DNA code for?

22. What does RNA stand for?

23. Create a matching (complementary) **mRNA** sequence for the following strand of a DNA molecule:



24. Describe the different functions for the three types of RNA.

25. Where does messenger RNA (mRNA) go?

26. What is a codon?

27. List each codon from the mRNA molecule in #23 (put a dash between each separate codon).

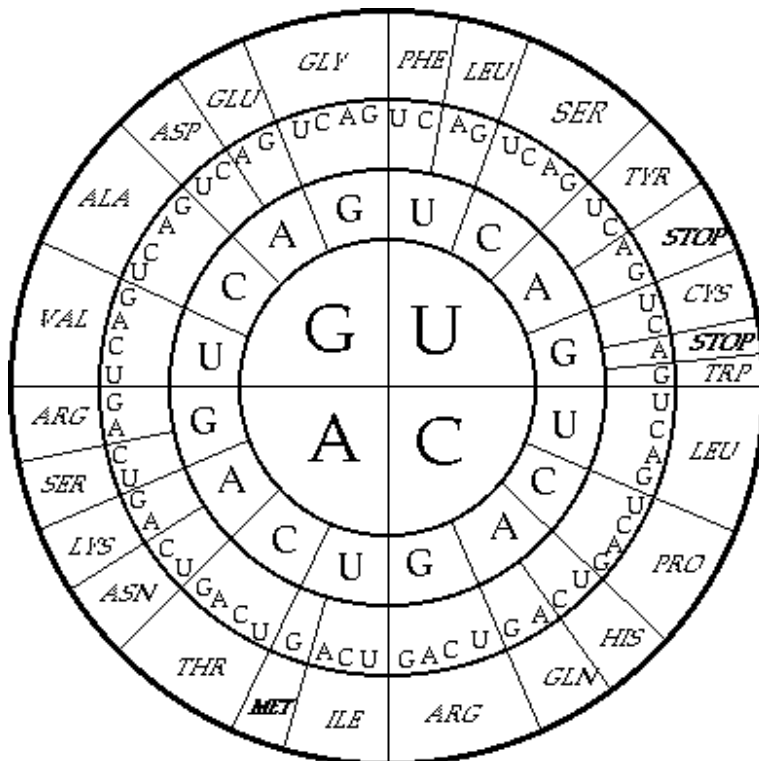
28. What is translation?

29. What is an anticodon?

30. Where are proteins made in the cell? _____

31. Use the following amino acid chart to translate the sequence of codons (from # 23) and write the amino acid sequence that results below:

Amino Acid Sequence:



32. Why are proteins important?
33. What is a mutation? Explain how a mutation alters the protein made by a gene.
34. Explain how the DNA code is used to make proteins in a paragraph or two. Be sure to address the roles of both transcription and translation.
35. Explain how and why each of the following biotechnology techniques is used, giving an example of each one:
- a. Genetic Engineering/ Recombinant DNA
 - b. PCR (Polymerase Chain Reaction)
 - c. Gel Electrophoresis