Reading Guide Packet: Chapters 13 & 14: DNA, RNA and Protein Synthesis
Biology A

Name_____Period_____

Chapter 13.1: Identifying the Substance of the Gene

1. In Griffith's experiments, when the heat-killed bacteria passed their disease-causing ability to the harmless bacteria, he called the process

2. Observation of bacterial transformation led to what important discovery?

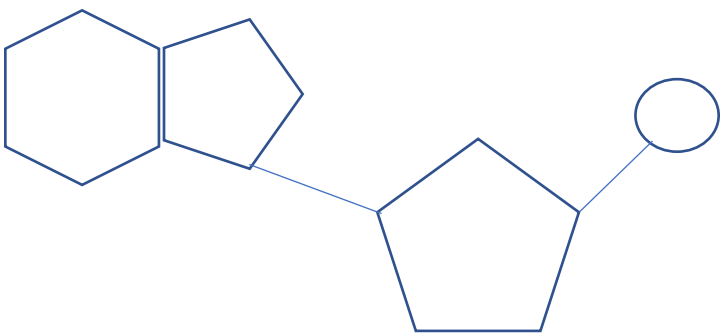
3. What is a *bacteriophage*? What did the Hershey-Chase experiments with bacteriophages confirm?

4. What functions must the DNA molecule be capable of carrying out?

Chapter 13.2: The Structure of DNA

5. What are the chemical components of DNA?

6. Label the parts of the DNA *nucleotide* below.



7. What did Erwin Chargaff discover?

8. What did the data in Rosalind Franklin's Photo 51 allow Watson and Crick to do?

9. The double-helix model of DNA explains what?

10. What is base pairing?

Chapter 13.3: DNA Replication

11. What is the role of DNA polymerase in replicating DNA molecules?

12. Compare DNA replication in prokaryote and eukaryote cells.

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Chapter 14.1: RNA

13. What are the key differences between RNA and DNA?

14. List the three types of RNA and their functions.

15. What is *transcription*? Where does it occur?

16. How does *RNA polymerase* know where to start and stop making a strand of RNA?

17. In RNA editing, what are *introns* and *exons*?

Chapter 14.2: Ribosomes and Protein Synthesis

18. How does the *genetic code* work?

19. What is a *codon*?

20. What is the "start" codon in the genetic code?

21. What is *translation*? Where does it occur?

22. How are *anticodons* related to *codons*?

23. How is it that proteins are the key to understanding how genes work?

24. What is the purpose of molecular biology?

Chapter 14.3: Gene Regulation and Expression

25. How are genes regulated in prokaryotes?

26. What is an *operon*?

27. In essence, what function do *promoters* and *operators* serve in gene regulation?

28. In eukaryotic gene regulation, what is the function of *transcription factors*?

29. Why is gene regulation more complex in eukaryotes?

30. What happens when cells *differentiate*?

31. What are *homeotic genes*?

32. What is the function of *Hox genes*?

33. What does it mean to say that some gene regulation is *epigenetic*?

34. What are some environmental factors that cause *epigenetic* expression of genes?

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Chapter 14.4: Mutations

35. Define *mutation*.

36. How is substitution point mutation different from a *frameshift mutation*?

37. How is *chromosomal mutation* different from a *point mutation*?

38. What is a *mutagen*?

39. Are all mutations harmful? Why or why not?

40. How can *polyploidy* be helpful to an organism?