

Name _____

AP Biology

Chapter 16 - The Molecular Basis of Inheritance

Guided Reading Assignment Campbell's 10th Edition

Essential Knowledge:

3.A.1 DNA, and in some cases RNA, is the primary source of heritable information

3.C.1 Biological systems have multiple processes that increase genetic variation

LO 3.1 The student is able to construct scientific explanations that use the structures and mechanisms of DNA and RNA to support the claim that DNA and, in some cases, RNA are the primary sources of heritable information.

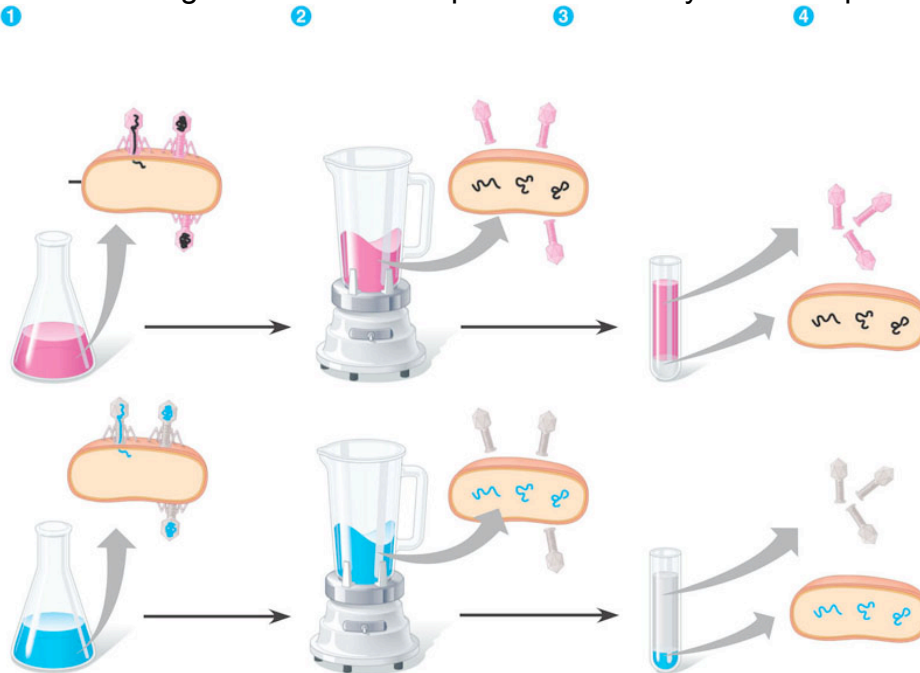
LO 3.2 The student is able to justify the selection of data from historical investigations that support the claim that DNA is the source of heritable information.

LO 3.3 The student is able to describe representations and models that illustrate how genetic information is copied for transmission between generations.

1. Explain Griffith's experiment and the concept of transformation in detail.

2. What is a bacteriophage?

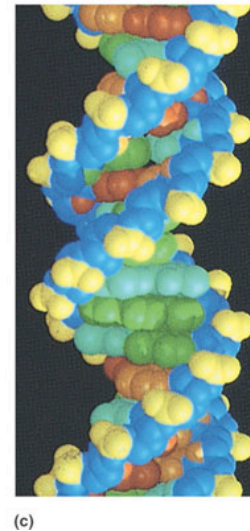
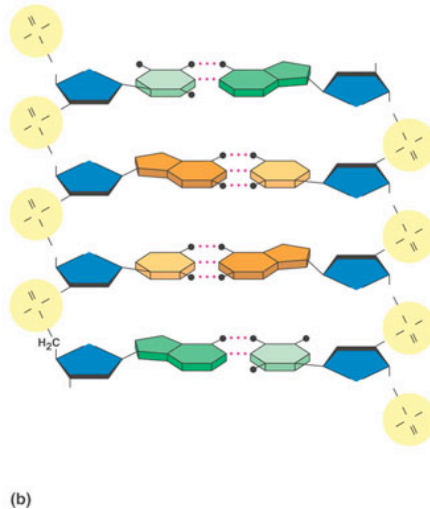
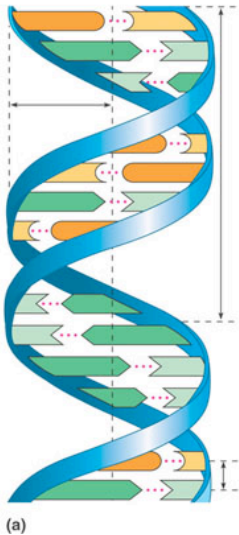
3. Label the diagram below and explain the Hershey Chase experiment.



4. How did Chargraff's work contribute to understanding the structure of DNA?

5. Why was Rosalind's Franklin's work essential to the understanding of the structure of DNA?

6. Label the structure below:



7. Why does adenine always pair with thymine and guanine with cytosine in DNA?

8. What is meant by the term that DNA replication is semiconservative?

9.

10. Detail the Meselson and Stahl experiment concerning DNA replication.

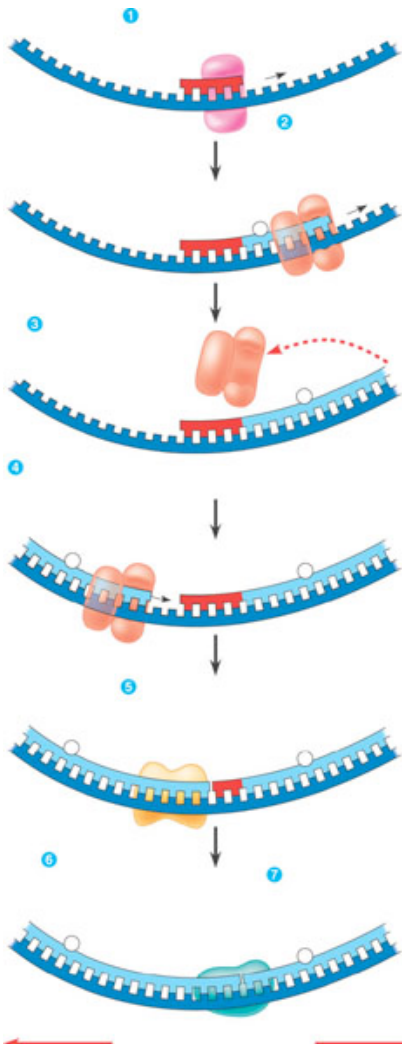
11. How is bacterial DNA replication accomplished?

12. What are DNA polymerases?

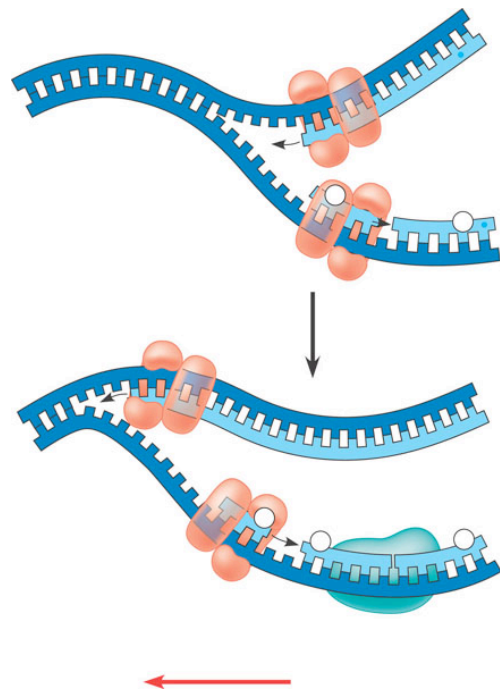
13. In your own words, what is meant by the term – DNA is antiparallel in arrangement”?

14. Define the following terms:

- a. Leading strand
- b. Lagging strand
- c. Okazaki fragments
- d. DNA ligase
- e. Primer



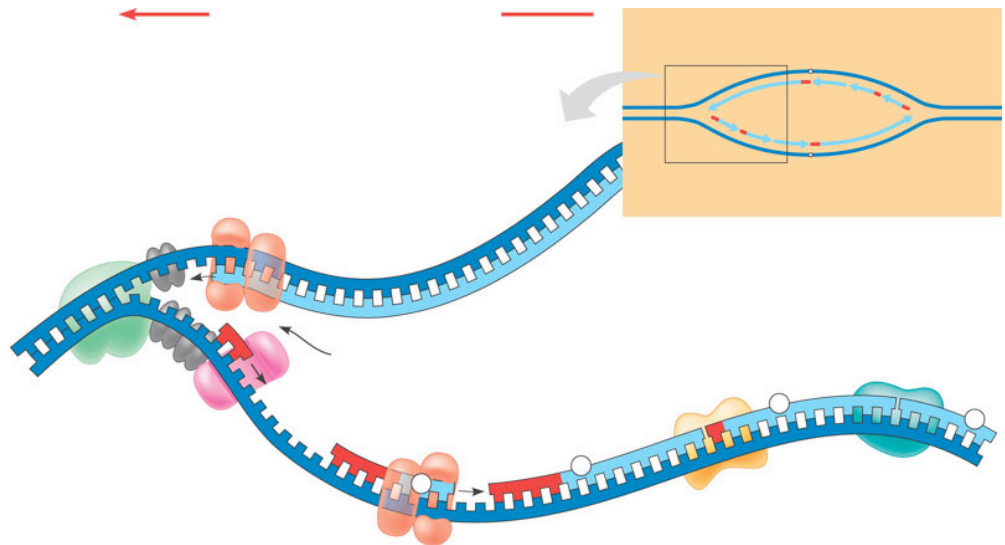
15. Label both diagrams:



16. List the functions of the following enzymes:

- a. Helicase
- b. Single stranded binding protein
- c. Topoisomerase
- d. Primase
- e. DNA Polymerase III
- f. DNA Polymerase I
- g. DNA Ligase

17. Identify and label the diagram:



18. What is mismatch repair?

19. Label the diagram:

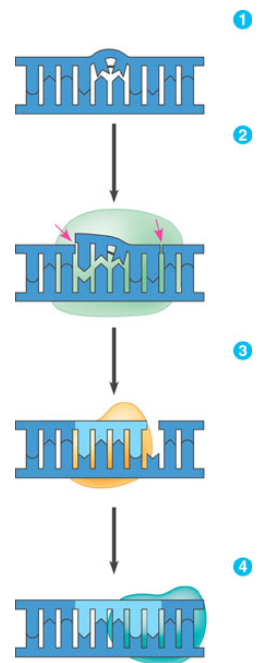
20. Why is there a short section of a cell's DNA that cannot be repaired or replaced? Draw your own diagram explaining the problem. It is very important that you understand this conceptually.

21. What are telomeres and why are they important? How does telomerase play a role?

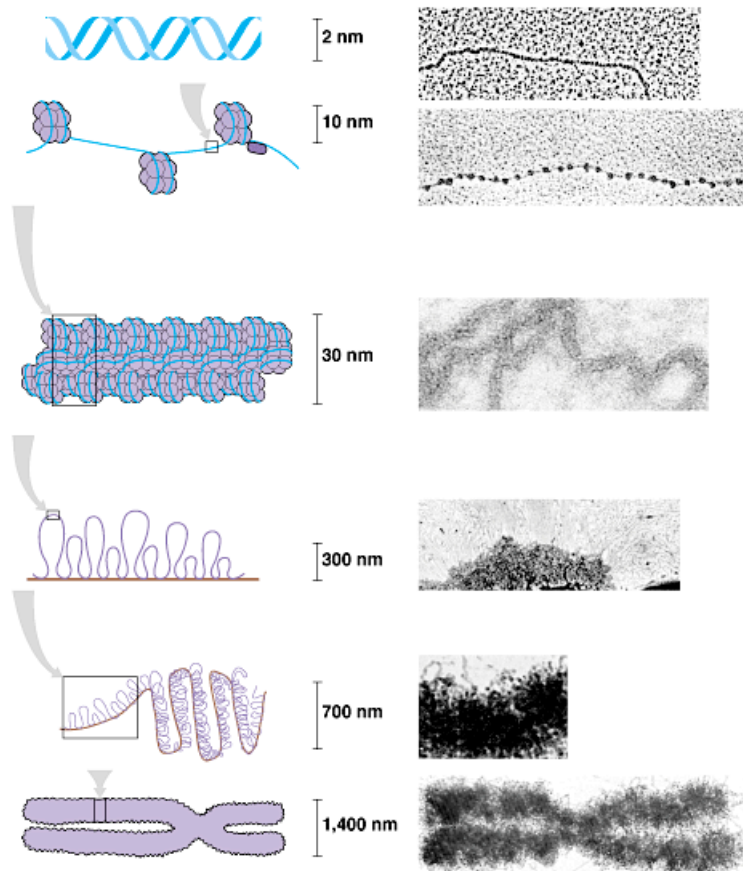
22. Define the following terms:

a. Chromatin

b. Nucleosome



23. Outline the levels of DNA packing in the eukaryotic nucleus below next to the diagram provided.



Copyright © Pearson Education, Inc., publishing as Benjamin Cummings.

24. What is the difference between heterochromatin and euchromatin? Which is transcribed?