

AP Biology Chapter 16 Section 2 Worksheet

1. What inspired Watson and Crick and led to their discovery of the double helix.
2. Explain what is meant by a template where DNA is concerned.
3. Explain the basic process behind replication of DNA.
4. Explain what is meant by semiconservative replication.
5. Explain Meselson and Stahl's work with regard to the following models:
  - conservative model
  - dispersive model
  - semiconservative model
6. How long does it take *e. coli*'s DNA to copy itself and how many base pairs is that? How long and how many in humans?
7. Explain what an origin of replication is. What is it in bacteria?
8. How does this process happen in bacteria?
9. How are origins of replication different in eukaryotic cells?
10. Explain the structure of an origin site in eukaryotic cells.
11. Explain the function of DNA polymerases.
12. Explain the beginning process of replication and what polymerase does in this process.
13. Explain what a nucleoside triphosphate is and its structure.
14. Explain what pyrophosphate is and how it is formed.
15. Explain what drives the polymerization of a nucleotide to a new strand of DNA.
16. Explain the structure of the 3 prime and 5 prime ends of a DNA strand.
17. Now explain what the term antiparallel means.
18. Explain how nucleotides are added to a growing DNA strand.
19. Contrast that to how the strand actually grows longer.
20. What problem does this difference create?
21. Explain the function of the leading strand.
22. Now explain what a lagging strand is.
23. Explain what an Okazaki fragment is.
24. Explain the function of DNA ligase.
25. Can DNA polymerases initiate synthesis of a polynucleotide? Explain
26. Explain what a primer is, its structure and its main function.
27. Explain the function of primase.
28. What do the leading and lagging strand require at the replication fork that can avoid problems in the replication process?
29. How long can DNA polymerase continue to add new nucleotides?
30. What happens to the primers before ligase joins the new fragments?
31. Explain the function of the following proteins:
  - helicases
  - single-strand binding proteins
32. Do polymerases actually move along a DNA strand? Explain
33. Explain the function of polymerases in the detection of mistakes in reading DNA nucleotides.
34. Explain what happens when a mistake occurs.
35. Give 3 environmental factors that can alter the reading accuracy of nucleotides.