

Name _____

Exploring DNA Replication with the Flow of Genetic Information Kit

Work through the Jmol Exploration on DNA Replication found at:

<https://cbm.msoe.edu/modelingResources/molecularExplorations/DNAreplication.html>

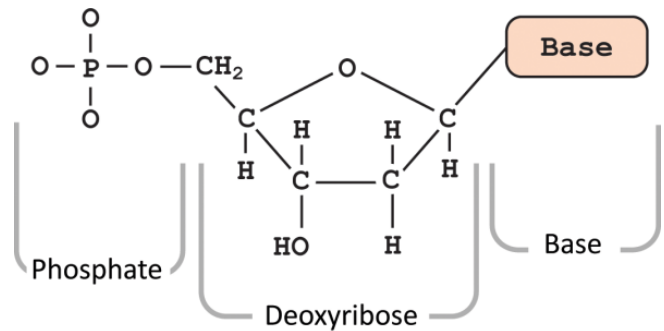
and complete the following questions when directed.

1. Record the paired nucleotide sequences in the space below.

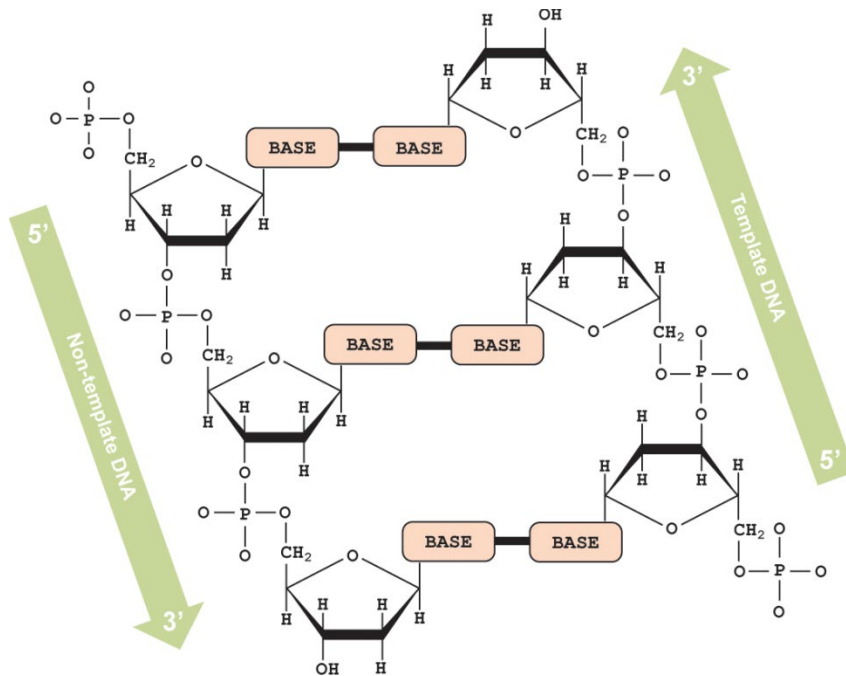


2. Examine the strands of DNA. What do you notice about the ends of the model?

3. Find and label the 3' carbon and the 5' carbon in the DNA nucleotide shown in the diagram to the right.



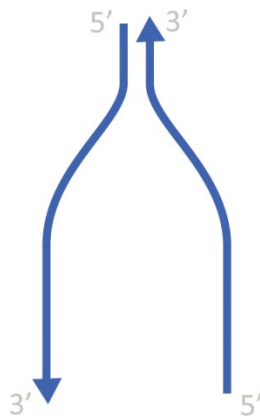
4. How are the 3' and 5' carbons oriented in the strands of the DNA molecule you assembled?



5. Circle the 3' carbons and draw triangles around the 5' carbons in the DNA molecule above.
6. What group is attached to the 3' carbon?
7. What group is attached to the 5' carbon?
8. Where does DNA replication begin on the chromosome?
9. What must happen to the DNA for replication to begin?
10. What does the helicase appear to be doing?

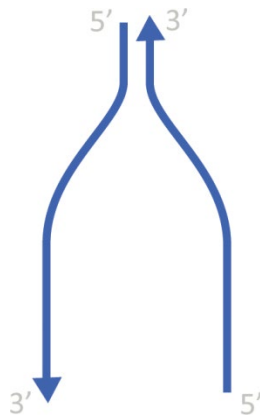
11. As a new nucleotide is added to the growing DNA strand, which part of the new nucleotide forms a bond with the 3' OH group on the DNA strand?

12. The arrows below represent DNA templates. Sketch and indicate the 5' and 3' ends of the newly replicated **leading strand** of DNA below:



13. You will not be able to synthesize the other strand of DNA in a continuous manner. Explain why not.

14. The arrows below represent DNA templates. Sketch and include the 5' and 3' ends of the fragments composing the **lagging strand** of DNA below:



15. Explain why DNA replication is considered to be a semi-discontinuous process.

16. How do these two new double-stranded DNA molecules compare to the original (parental) double-stranded DNA?