Name: _____ Date: _____ Period: ____

DNA Replication Week # ____

Directions: Read and annotate the passage. Then answer the questions.

Recall that before a cell can divide, its DNA must first be copied, or replicated. We will investigate how the base pairing nature of DNA makes it possible to accurately create a new molecule of DNA.

Figure 1 shows a molecule of DNA as a double helix. In order to replicate, the double helix must "unzip" or separate, separating the paired bases from each other. This reveals a template for the new strands of DNA to form along the inside of the double helix.

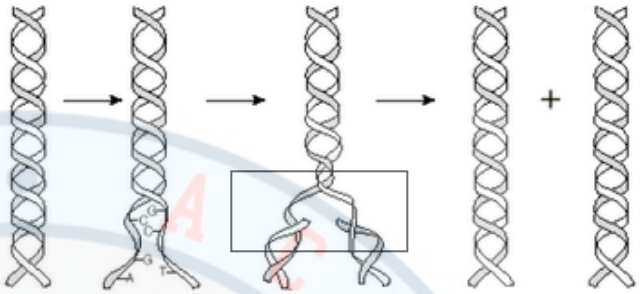

Figure 1

1. DNA replication is described as **semi-conservative**. Describe the new molecules of DNA to determine the meaning of this term.

_____

Figure 2 shows a close up of the box in Figure 1.

DNA polymerase is the enzyme that joins individual nucleotides together to form a new strand of DNA.

2. Fill in the missing bases (A, T, G, or C) in Figure 2 to show complementary base pairing.
3. Draw solid lines to represent the covalent bonds between nucleotides within each DNA strand.
4. Draw dashed lines to represent the hydrogen bonds between the bases of the two strands.

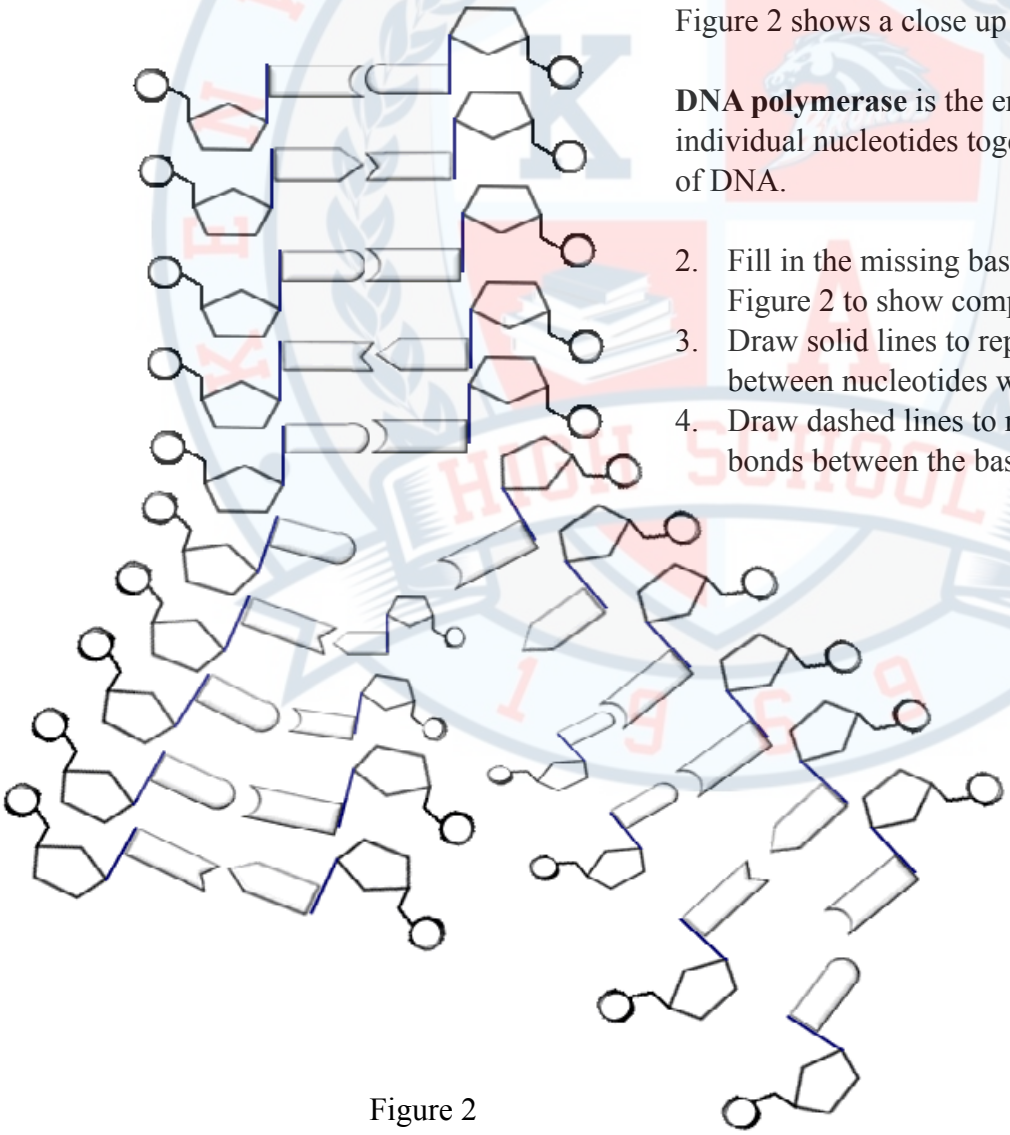

Figure 2

Name: _____ Date: _____ Period: ____

Analysis Questions

5. Why is it important that DNA polymerase is accurate in adding nucleotides to the new strands of DNA? _____

_____

6. Covalent bonds are much stronger than hydrogen bonds.
   a. Why does it make sense that stronger bonds hold nucleotides together within a strand of DNA?

   _____

   _____

   b. Why does it make sense that weaker bonds hold the two strands of DNA together?

   _____

   _____

Directions: All of the following statements are false. Edit them to make them correct.

7. The function of DNA is to store, copy, and transmit proteins.

8. Cytosine and adenine are examples of deoxyribose sugars.

9. The technical term for the shape of DNA is a helix.

10. Adenine always pairs with guanine.

11. A nucleotide consists of a phosphate group, base, and amino acid.

12. The "handrails" or backbone of a DNA strand is made of bases.

13. The sequence of nucleotides within a strand of DNA is connected by hydrogen bonds.

14. DNA replication occurs after cell division.

15. DNA replication results in two molecules of DNA, one old molecule and one new molecule.