Name:_____ Period:_____ Date:_____

DNA Replication Practice

Directions: Below are the three steps of DNA replication. Follow the instructions for each step and then answer the questions that follow.

When a cell copies a DNA molecule:
1. DNA is unzipped by helicase (**initiation**).
2. Complementary bases are added to each template strand by DNA polymerase (**elongation**).
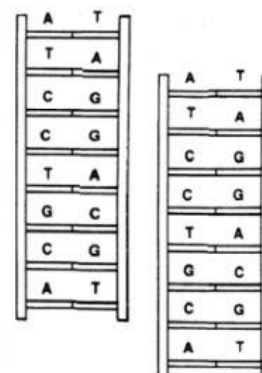3. Two new strands are checked for errors by DNA polymerase, then DNA winds up (**termination**).
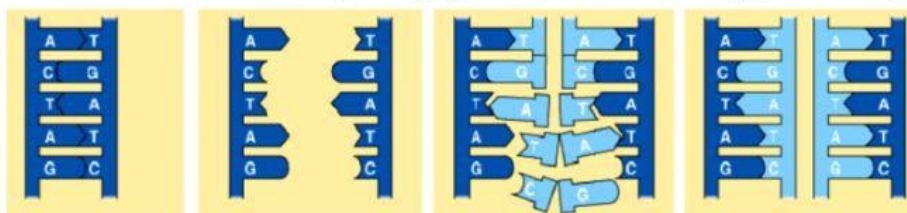
1. What is happening to the DNA molecule in the figure?

   (Explain the first step in DNA replication)

   _____

   _____

   _____
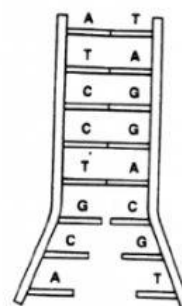
2. What happens to the DNA molecule during the second step of DNA replication?

   _____

   _____

   _____
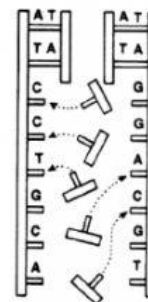
3. What happens during the third step of DNA replication?

   _____

   _____

   _____

4. What does it mean that the two strands of DNA are **complementary**? _____

_____

5. What is **DNA replication**? _____

6. Using your knowledge of DNA replication, place the steps below in the correct order. (Write "1" for the first step, "2" for the second, etc.)

    a. _____ The enzyme DNA polymerase moves along the strands and adds complementary nucleotides to each exposed nucleotide in the existing strands.

    b. _____ Helicase unzips the DNA double helix down the middle between the base pairs.

    c. _____ A complementary strand is created for each of the two strands of the original double helix.

    d. _____ Two new identical DNA molecules have been produced.

7. True or False: The process of DNA replication results in a copy of the original DNA molecule.

8. True or False: DNA does not have to break apart to be copied.

9. True or False: After DNA replication is complete, there are two new DNA molecules; one molecule has both of the original strands and one molecule has two new strands of DNA.

10. In what cell organelle does DNA replication happen? _____

11. During what phase of the cell cycle does DNA replication happen? _____

12. Below are some DNA strands. Use the base pairing rules to fill in the complementary strands.

    a. Original strand: A T G C A A A T T G C T C A C C G G G A T C A C

    _____

    b. Original strand: A G G G G A T C A G C A C C G G A T T T C A T G

    _____

    c. Original strand: T G A C G A T C G A T G C A C A T G C A T G G C

    _____