Name _____ Date _____ Period _____

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DNA Replication

Biology

Directions: Answer each question in the space provided. Show your work for every calculation. For Claim, Evidence, Reasoning (CER) questions, write all three parts.

1. Complete the sentences using these words: helicase, DNA polymerase, template, semiconservative.

a. The enzyme that unwinds the DNA is _____.

b. The enzyme that adds new nucleotides is _____.

c. Each old strand acts as a _____ for the new strand.

d. Because each new molecule has one old and one new strand, replication is called _____.

2. A template strand reads ACGGTCAT. Write the new strand that DNA polymerase builds along it.

3. A 450-base-pair DNA segment is copied once. How many new nucleotides are added? Show your work.

4. One DNA molecule is copied through 4 rounds of replication. (a) How many molecules are there at the end? (b) How many contain a strand from the original molecule? (c) How many are made only of new strands?

5. Why must a cell copy its DNA before it divides?

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6. The table shows Meselson-Stahl results. Write a Claim, Evidence, Reasoning response: do the data support the conservative model or the semiconservative model?

Generation	Bands seen
0 (all N-15, heavy)	one low band (heavy)
1	one middle band (hybrid)
2	one middle band (hybrid) and one high band (light)

7. Describe what helicase does and what DNA polymerase does in replication.

8. DNA polymerase proofreads. Explain what that means and why it matters.

9. An error in copying is not fixed. Name what this error is called and explain how it could affect the variation of traits in a population.

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