Name answer key Date _____

DNA REPLICATION

Answer the following questions.

1. Why the two strands of the helix have to be elongated by to slightly different mechanism?
   Strands must be built from 5' to 3'. Leading strand can be built continuously following replication fork. Lagging strand must be built moving away from fork, so polymerase must restart repeatedly by moving further back into opening fork.
2. How does replication start? Who prevents the unwound DNA for twisting back?
   Helicase uzip DNA, single stranded binding proteins keep it unzipped

3. Which enzymes is the key player in Replication? What is this enzymes limitation? How is this limitation overcome?
   DNA polymerase – can't add nucleotides from scratch. Primase adds RNA nucleotides to create primer for DNA polymerase.

4. Explain elongation stage of replication – you answer should include a discussion of leading strands, lagging strand, Okazaki pieces and RNA primer.
   Primase adds primer near inside of fork, DNA polymerase III adds nucleotides 5'–3' moving away from fork. After catching up to previous primer, DNA polymerase III must detach and move further into the expanding fuck, after primase has added another primer DNA nucleotides. Ligase repairs the nick in the sugar phosphate backbone attaching Okazaki fragments together.

5. List the proteins/enzymes involved in the process of replication.
   Helicase, topoisomerase, single stranded binding proteins, primase, DNA polymerase (1. II and III), ligase