DNA replication starts from 3' end (5' end placed down) DNA polymerase moves down the strand that's being slowly unzipped (can only attach self to 3' end of template) must create the 5' end first DNA primase goes on the side being unzipped backwards and places an RNA fragment there, Describe the process of DNA replication How did Meselson and Stahl's experiment provide evidence on the way DNA replicate?

DNA ligase: join the 2 okazaki strands DNA polymerase: attaches to the 3' strand of parent strand for DNA to be made from 5' to 3' (daughter strand) DNA polymerase III DNA primase: a form of RNA polymerase that puts RNA primer there

Helicase: break the hydrogen bond holding the 2 bonds together

Replication of a DNA molecule begins at special sites called origin of replication. Helicase attaches to the DNA, uncoiling the double helix, separating the strands. Single stranded binding proteins stabilize the separated DNA strands. Each parent strand acts as a template for replication. RNA primase binds to the initiation site, synthesizing short RNA primer. DNA polymerase elongates the new daughter strand in the 3' to 5' direction of the parent strand. Replication using the 3' to 5' parent strand results in the daughter strand being formed continuously, forming the leading strand. Replication using the 5' to 3' parent strand results in the daughter strand, which is the lagging strand, being formed discontinuously, forming okazaki fragments. RNA primase is removed and the nicks between the okazaki fragments are filled by DNA ligase by forming phosphodiester bonds between okazaki fragments. Therefore, 2 identical DNA double helix molecules formed using the semiconservative model, where half of the parentals molecule is maintained and paired with a daughter strand.

## OR

DNA replication is semi-conservative. It begins at specific origins of replication where replication bubbles are formed. Two parental DNA strands separate by breaking the hydrogen bonds. The single-stranded DNA becomes the templates for the synthesis of two new strands; Primase catalyzes synthesis of RNA primer to provide free 3' OH for DNA polymerase to synthesize new DNA strand. Free deoxyribonucleotides are incorporated by complementary base pairing to the parental DNA strands with adenine to thymine and guanine to cytosine. DNA polymerase catalyzes phosphoester bonds formation between the free 3' OH of terminal nucleotide of growing daughter DNA strand and 5' phosphates of incoming deoxyribonucleotides. DNA synthesis occurs in the 5' to 3' direction. In a replication fork, the leading strand is synthesized continuously while lagging strand is discontinuously synthesized as Okazaki fragments. RNA primers are removed and replaced by DNA. DNA fragments are ligated together by DNA ligase.