1. **Helicase** enzymes unwind the parental double helix by separating the two strands of nucleotides.

2. **Single-strand binding proteins** stabilize the separated parental DNA strands and keep them from re-pairing.

3. **Topoisomerase** enzyme breaks, swivels, and rejoins the parental DNA ahead of the replication fork, relieving the strain caused by unwinding of the DNA molecule.

4. **Primase** synthesizes short pieces of RNA primers using the DNA as a template.

5. After the RNA primer is made, **DNA polymerase III** begins to synthesize the leading strand continuously in the 5’ to 3’ direction moving towards the replication fork.

6. Primase begins synthesis of RNA primers on the lagging strand.

7. **DNA polymerase III** adds nucleotides to the primer on the lagging strand forming **Okazaki fragments**.

8. **DNA polymerase I** removes the primers on both the leading and lagging strands and replaces the primers with DNA nucleotides.

9. **DNA ligase** joins the Okazaki fragments together on the lagging strand by joining the sugar-phosphate backbones to create one continuous DNA strand.

10. **DNA polymerase** enzymes also act as proofreading enzymes for replication accuracy and mismatch repair.