DNA replication is the process by which a double-stranded DNA molecule is copied to produce two identical DNA molecules. Whenever a cell divides, the two new daughter cells must contain the same genetic information as the parent cell.

DNA replication initiates at specific points, called origins, where the DNA double helix is unwound. A short segment of RNA, called a primer, is then synthesized and acts as a starting point for new DNA synthesis. An enzyme called DNA polymerase next begins replicating the DNA by matching bases to the original strand. Once synthesis is complete, the RNA primers are replaced with DNA, and any gaps between newly synthesized DNA segments are sealed together with enzymes.

Schematic of Watson and Crick's basic model of DNA replication.

1. DNA double helix.

2. Hydrogen bonds break and helix opens.

3. Each strand of DNA acts as a template for synthesis of a new, complementary strand.

4. Replication produces two identical DNA double helices, each with one new and one old strand.