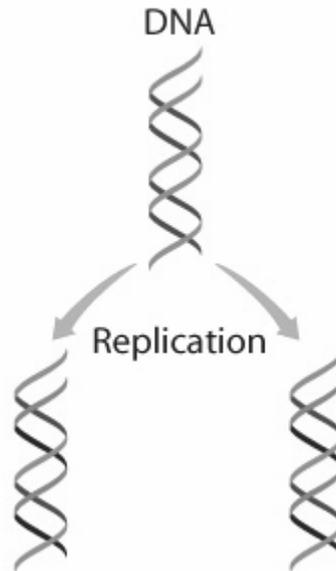


# DNA Replication Worksheet Answer Key

1. DNA replication is semi-conservative. This means that each new molecule of DNA contains one strand of the original parent DNA and one strand of new, complementary DNA. Each new DNA molecule thus contains half of the original molecule.



2. Replication starts at a specific nucleotide sequence known as the replication origin. A group of enzymes called helicases bind to the replication origin, cleaving and unravelling a section of the DNA double helix. In doing so, a region of DNA, known as the replication bubble, is opened up with two Y-shaped regions at either end. Each Y-shaped area is called a replication fork and consists of two unwound complementary single strands of DNA that serve as templates for semi-conservative replication when it begins.
3.
  - a) DNA polymerase is an enzyme that inserts into the replication bubble and adds new nucleotides to create a complementary strand of DNA.
  - b) RNA primer is a short strand of RNA that serves as a starting point for the attachment of new nucleotides during elongation.
  - c) Okazaki fragments are short segments of DNA that are complementary to the lagging strand of DNA; they allow for simultaneous replication of both strands of the parent DNA.
  - d) DNA ligase is an enzyme that splices together Okazaki fragments.
4. The leading strand is replicated continuously while the lagging strand is replicated in short, discrete fragments that are later spliced together. The lagging strand must be replicated in short fragments so that the nucleotides can be added in the 5' to 3' direction. Elongation by DNA polymerase can only take place in this direction.