

DNA Replication

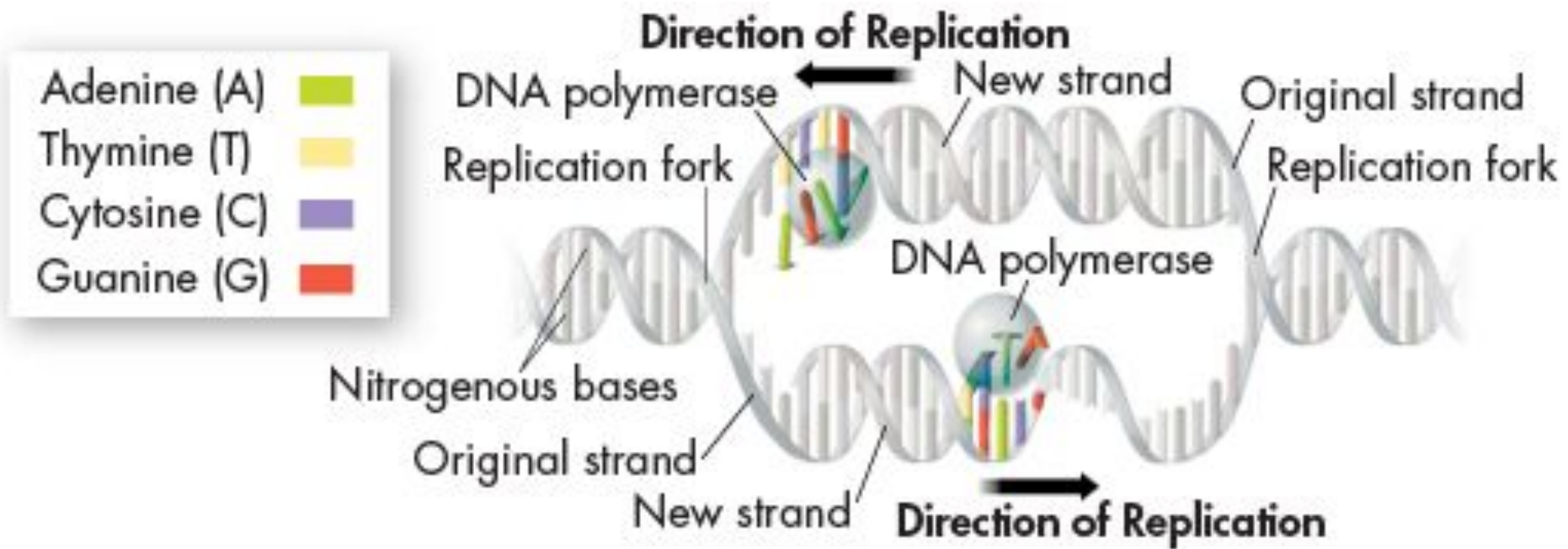
- Before a cell divides (either in mitosis or meiosis), it duplicates its DNA in a copying process called **replication**.
- This process ensures that each resulting cell has the same complete set of DNA molecules.

DNA Replication

- Each strand of the double helix has all the information needed to reconstruct the other half by the mechanism of **base pairing**.
- Because each strand can be used to make the other strand, the strands are said to be **complementary**.

DNA Replication

- The two strands of the double helix **separate**, or “unzip,” allowing two **replication forks** to form.



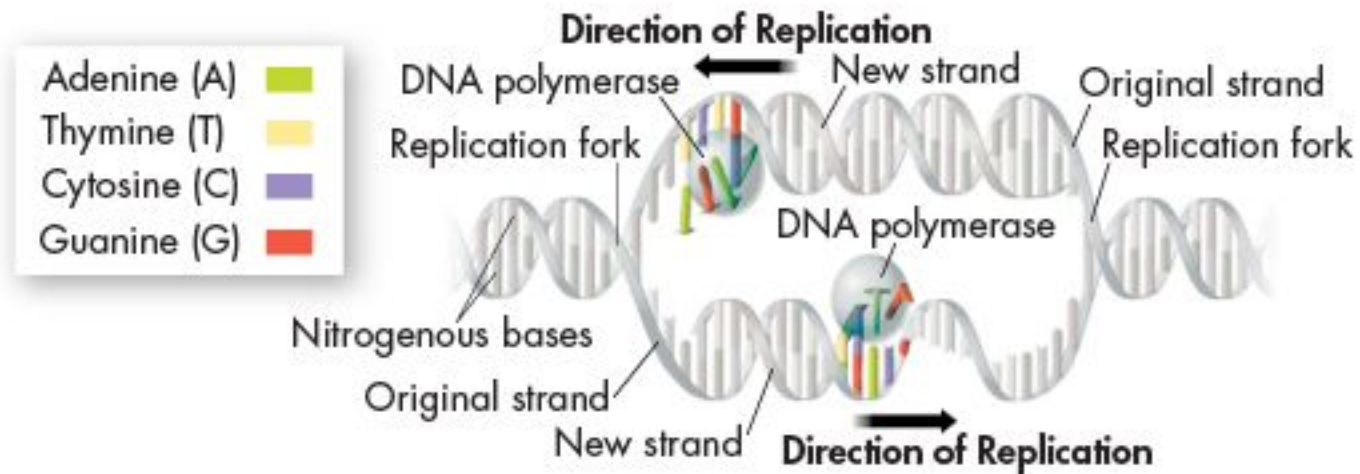
DNA Replication

- As each new strand forms, new bases are added following the **rules of base pairing**.
- If the base on the old strand is **adenine**, then **thymine** is added to the newly forming strand.
- Likewise, **guanine** is always paired to **cytosine**.



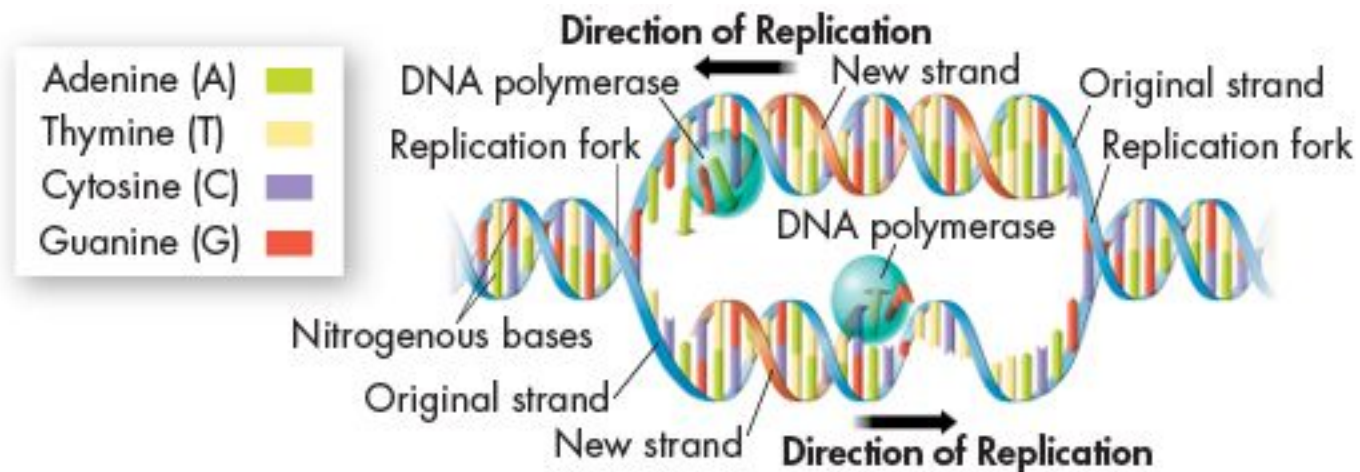
DNA Replication

If the base sequence on a separated DNA strand is CGTAGG, what will the base sequence on its complementary strand be?



DNA Replication

- The result of replication is two DNA molecules identical to each other and to the original molecule.
- Each DNA molecule resulting from replication has **one original strand** and **one new strand**.

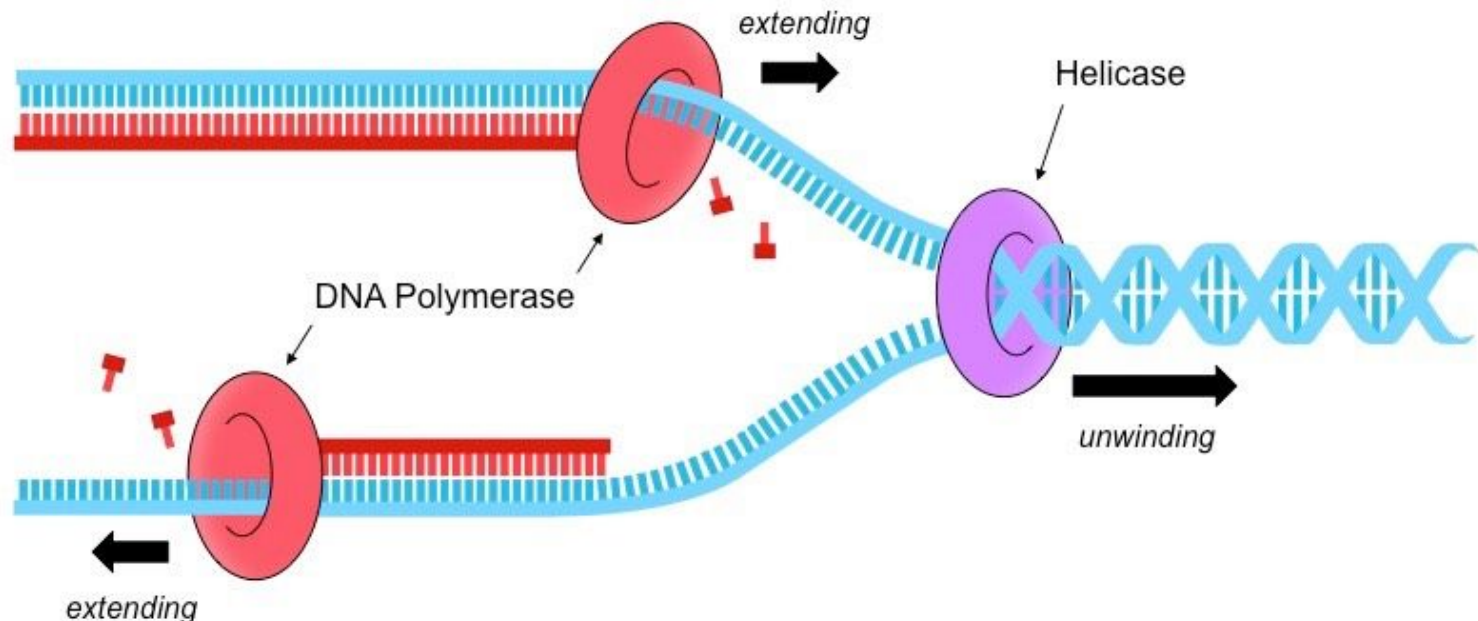


The Role of Enzymes

- DNA replication is carried out by a series of **enzymes**:

1. Helicase

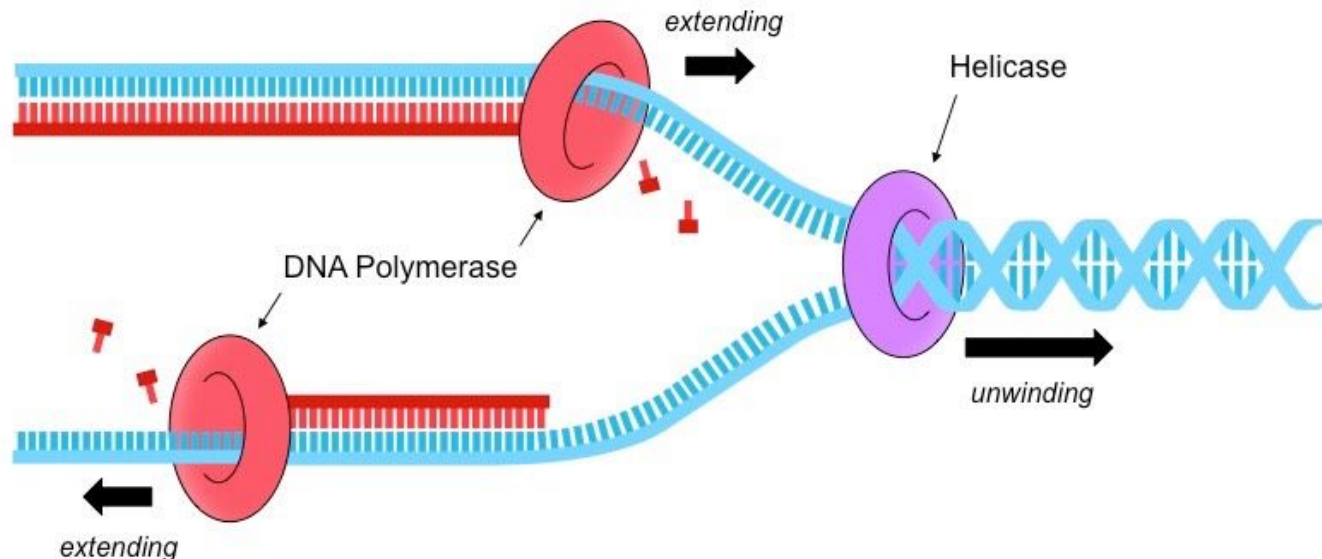
- “Unzips” and “unwinds” a molecule of DNA by breaking the **hydrogen bonds** between base pairs.



The Role of Enzymes

2. DNA Polymerase

- Joins individual **nucleotides** to produce a new strand of DNA.
- Also “**proofreads**” each new DNA strand, ensuring that each molecule is a perfect copy of the original.



DNA Replication Video

