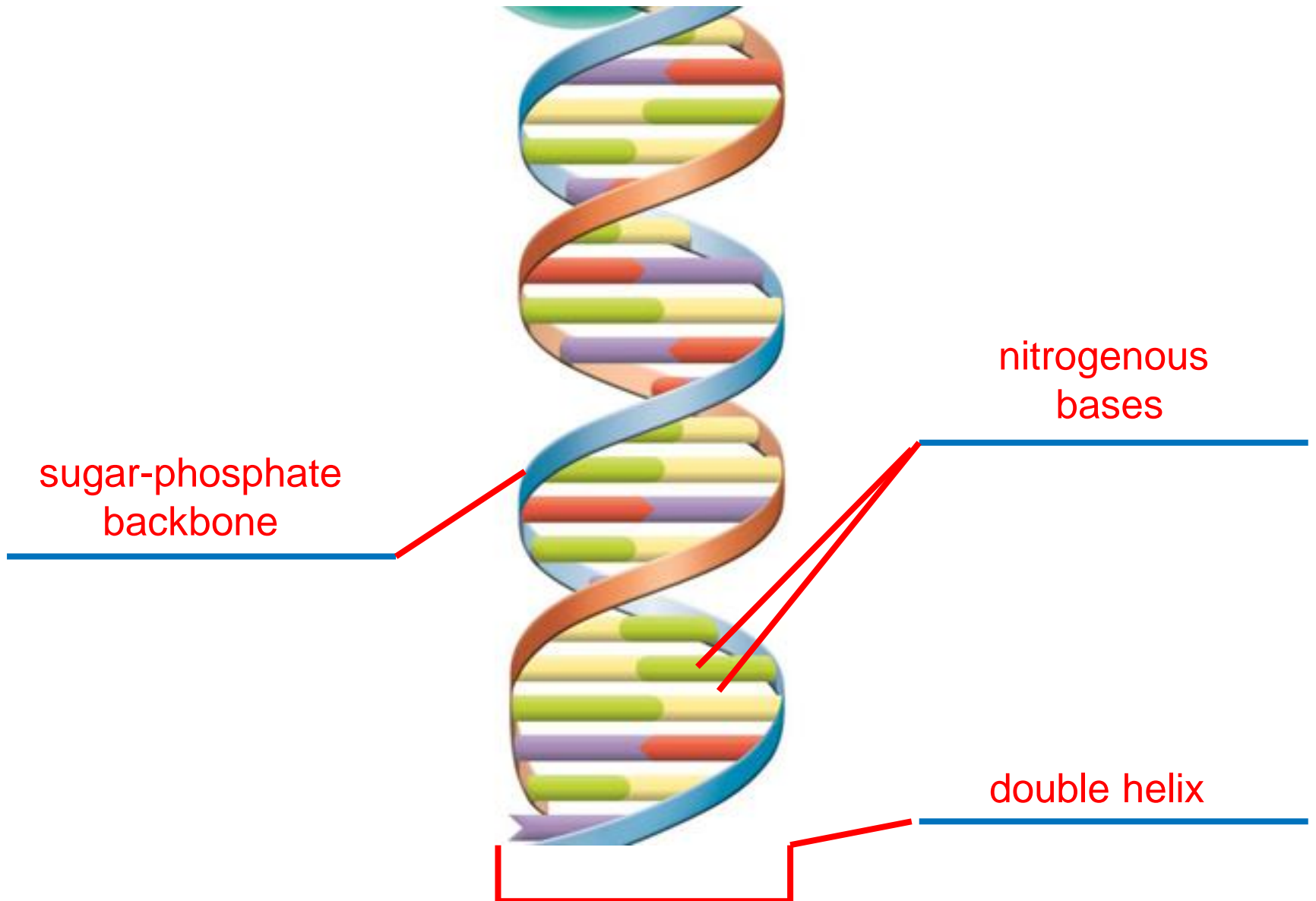


DNA Replication



Review of DNA Structure



Copying the Code

- Remember before a cell divides, its DNA must be copied.
- Base pairing explains how DNA could be copied as each base on the strand only pairs up with one other base.
 - The strands are said to be complementary.
- **Replication:** duplicating DNA in a copying process during the S phase of the cell cycle.
 - The two strands of each DNA molecule separate.
 - Each strand serves as a template for a new strand.

Copying DNA

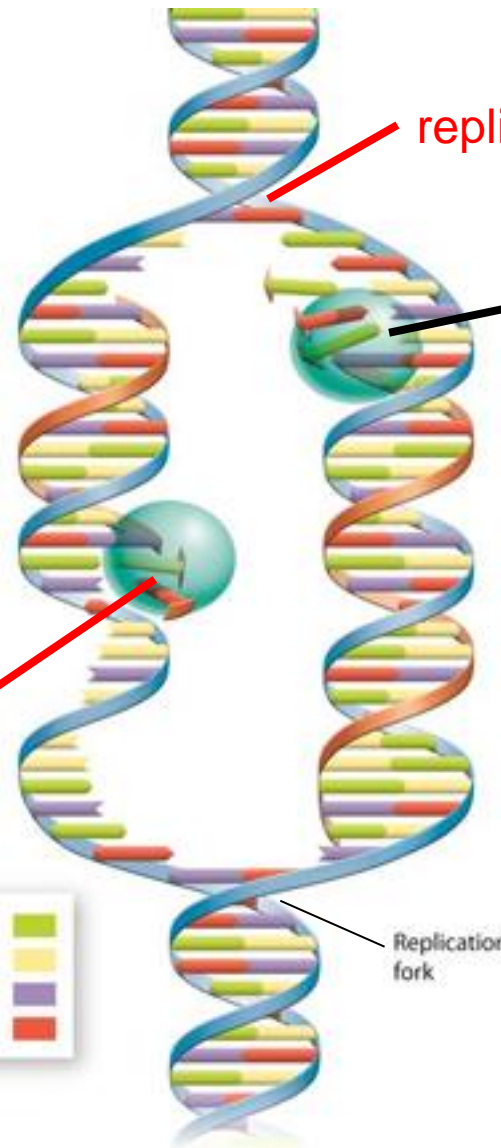
DNA polymerase:
the principal enzyme
involved in DNA
replication

Direction
of replication



new nucleotides
being added

Adenine (A)	Green
Thymine (T)	Yellow
Cytosine (C)	Purple
Guanine (G)	Red



replication fork

DNA polymerase

Replication
fork

Direction
of replication



DNA polymerase
joins nucleotides to
synthesize a new
complementary
strand of DNA

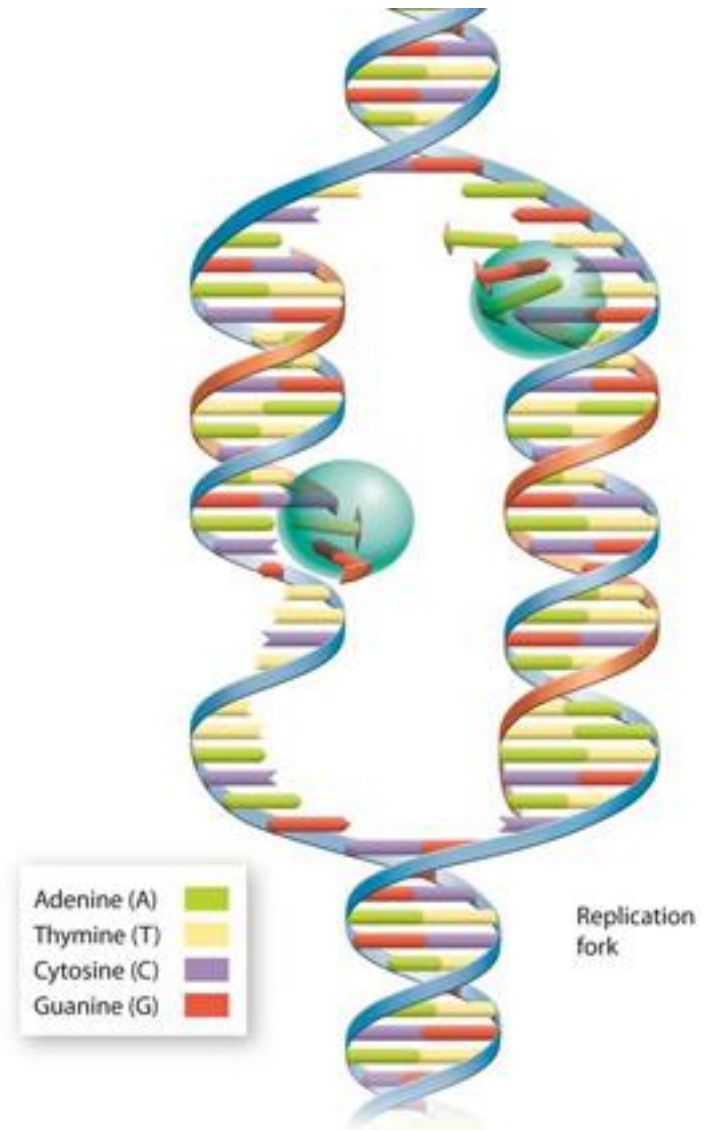
DNA Replication

The blue strand represents the original DNA strand.

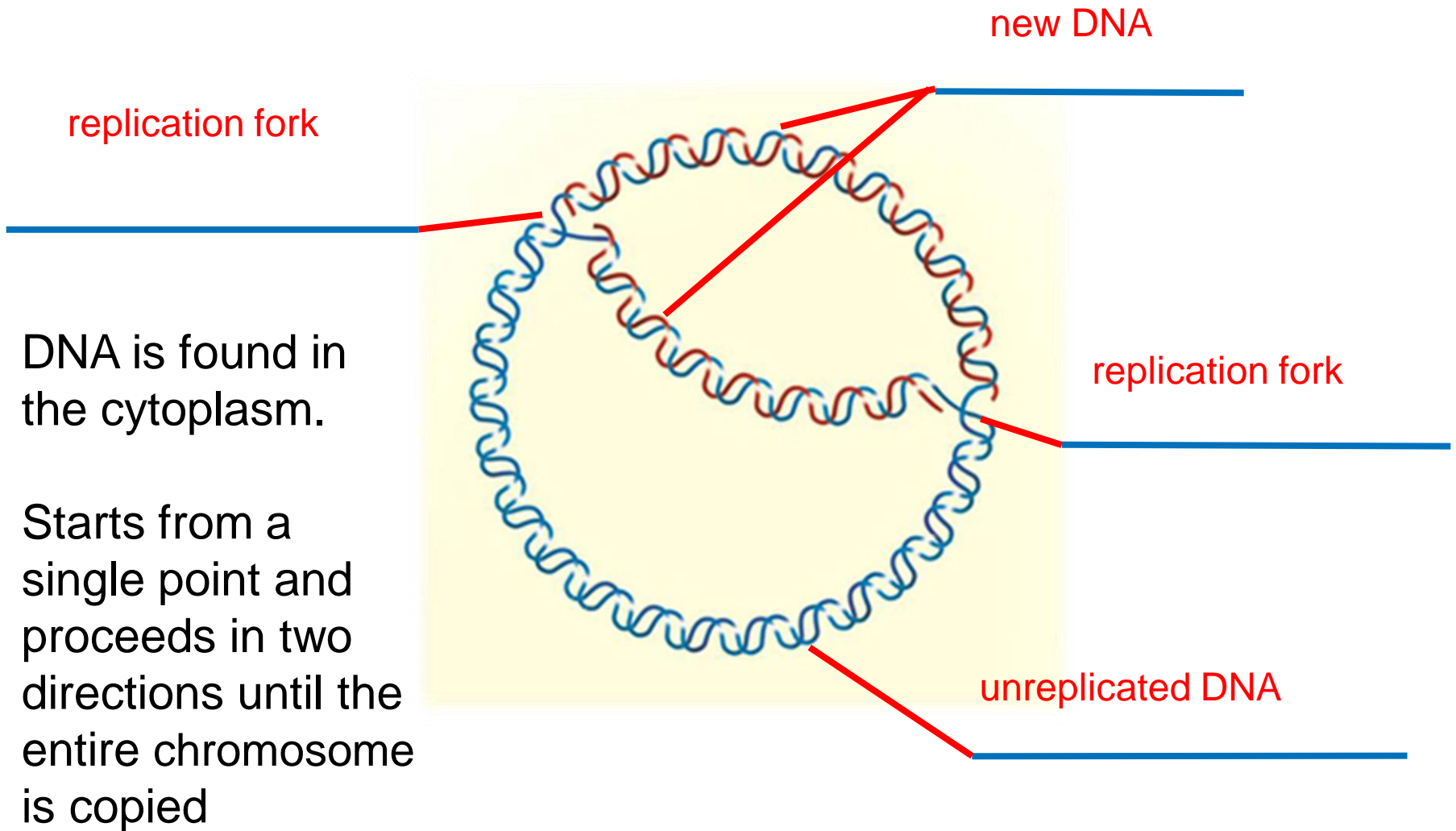
The orange strand represents the new DNA strand.

DNA replication occurs during the S phase of the cell cycle.

Replication must be completed before a cell enters mitosis or meiosis.



Prokaryotic DNA Replication

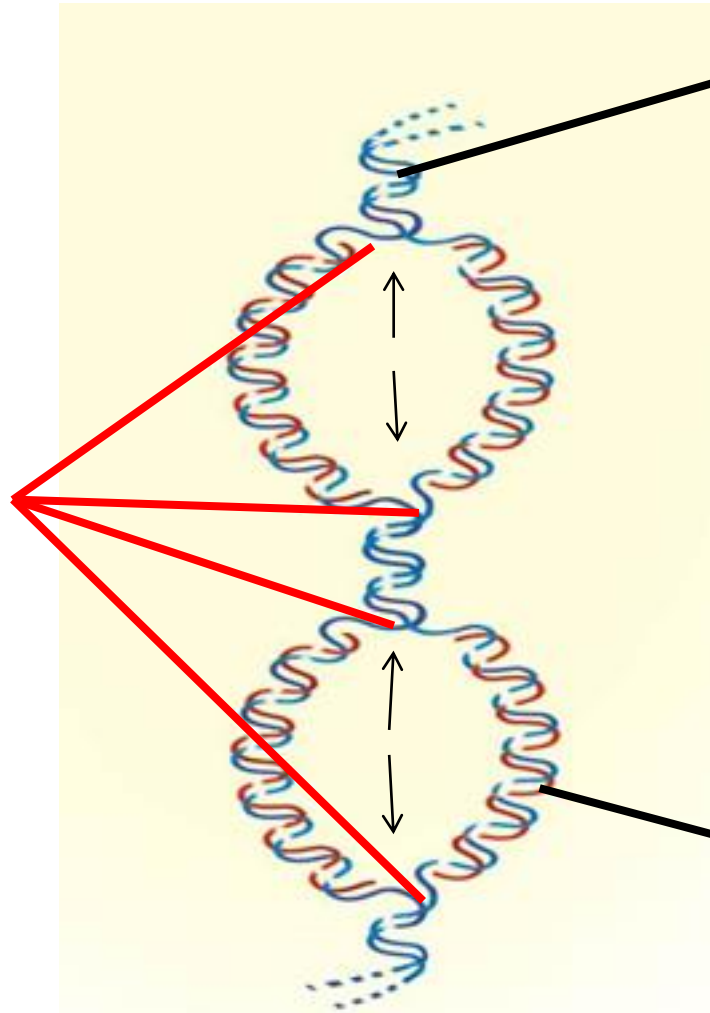


Eukaryotic DNA Replication

Chromosomes are much larger and more complex.

Replication forks

Replication may begin at a dozen or hundreds of places on the DNA molecule.



Unreplicated DNA

It proceeds in both directions until each chromosome is completely copied.

Several proteins check the DNA

New DNA

Checks for damage or mismatches.