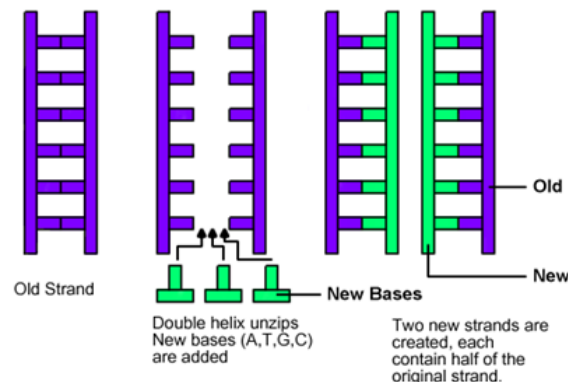


DNA REPLICATION (S Phase)

the process by which DNA makes a copy of itself (cell division)



SEMI-CONSERVATIVE - half of the old strand is saved

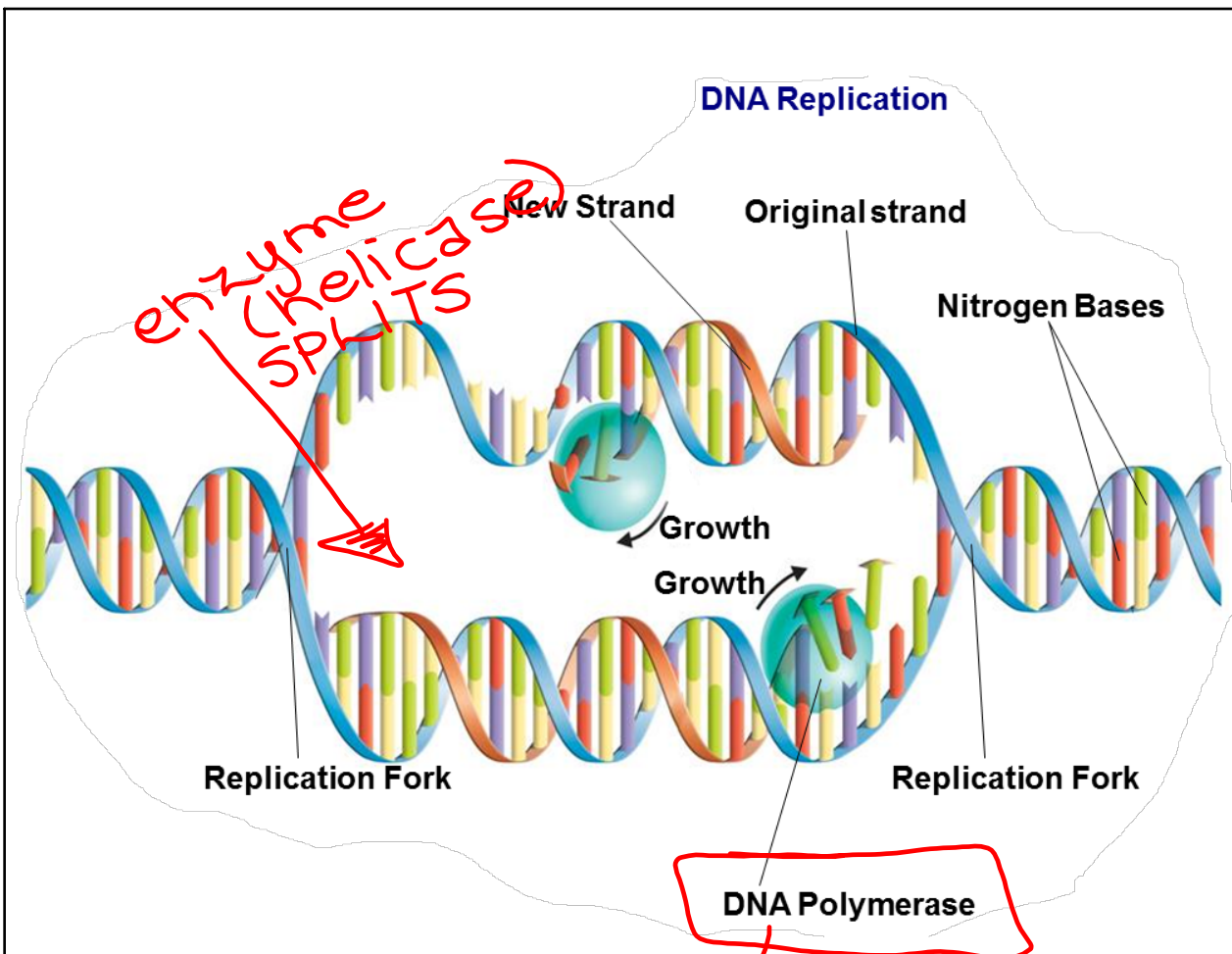
Each strand of the DNA double helix has all the information needed to reconstruct the other half by the mechanism of base pairing.

In eukaryotic chromosomes, DNA replication occurs at hundreds of places. Replication proceeds in both directions until each chromosome is completely copied.

Duplicating DNA

Before a cell divides, it duplicates its DNA in a process called **replication**.

During DNA replication, the DNA molecule separates into two strands, then produces two new complementary strands following the rules of base pairing. Each strand of the double helix of DNA serves as a template for the new strand.



How Replication Occurs

DNA replication is carried out by enzymes that “unzip” a molecule of DNA (ex. DNA Helicase).

Hydrogen bonds between base pairs are broken and the two strands of DNA unwind.

The principal enzyme involved in DNA replication is **DNA polymerase**.

DNA polymerase joins individual nucleotides to produce a DNA molecule and then “proofreads” each new DNA strand.

- nucleotides are found in the cytoplasm
- come from foods we consume

1. Why is DNA replication referred to as semi-conservative?

- half of the original DNA is conserved.

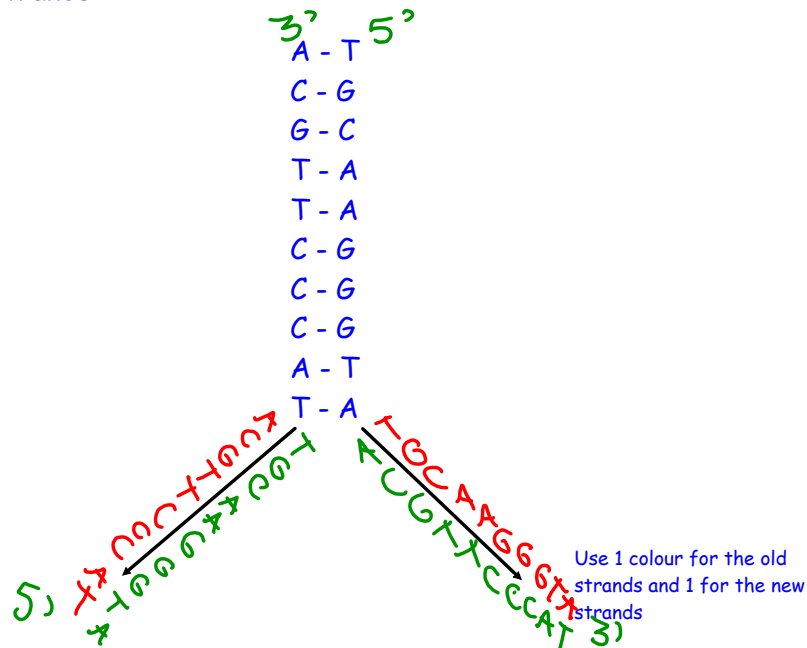
2. If the DNA strand has the base pairs C-G-T T-A-T G-G-G A-C-C what would the complimentary strand be?

G C A A T A C C C T G G

3. If 19% of the nitrogen base pairs in a particular DNA molecule are adenine, what percentages of thymine, guanine, and cytosine are present?

19%
 38% → 62%
 31% → 31%
 G C

4. Given the following strand of DNA, write the 2 new strands:



1. Why is DNA replication referred to as semi-conservative?

2. If the DNA strand has the base pairs ~~C-G-T~~ ~~T-A-T~~ ~~G-G-G~~ ~~A-C-C~~ what would the complimentary strand be? What would the 2 new DNA strands be?

3. If 19% of the nitrogen base pairs in a particular DNA molecule are adenine, what percentages of thymine, guanine, and cytosine are present?

A - 19%
 T - 19%
 G - 31%
 C - 31%

100%
 38%
 62%
 100

4. Given the following strand of DNA, write the 2 new strands:

A - T
 C - G
 G - C
 T - A
 T - A
 C - G
 C - G
 C - G
 A - T
 T - A

Use 1 colour for the old strands and 1 for the new strands

