

DNA nucleotides

DNA Function

Base sequence that forms the genetic code for producing specific proteins.

Nucleotides

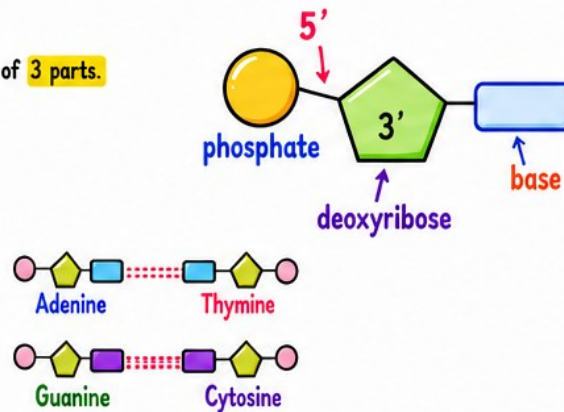
Smallest unit of DNA made up of 3 parts.

1. Phosphate – carbon 5
2. Deoxyribose – carbon 3
3. base

Adenine pairs with Thymine.

Guanine pairs with Cytosine.

★ ALWAYS USE FULL NAMES ★



Stages of DNA replication

Stage 1

DNA unwinds and separates into two template strands, breaking hydrogen bonds between the bases.

Stage 2

Primers bind to the 5' end of the new strand, starting DNA replication by allowing DNA polymerase to add DNA nucleotides.

Stage 3

DNA polymerase adds free complementary DNA nucleotides to the 3' end of the new DNA strand.

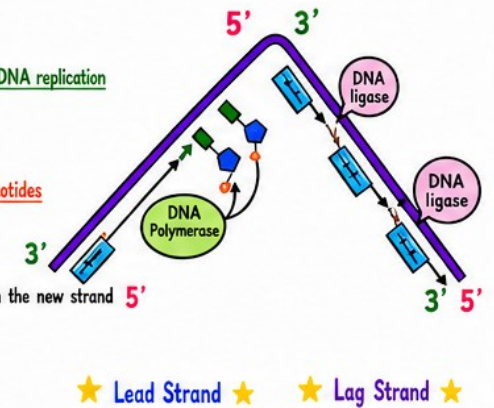
Stage 4

DNA polymerase only adds nucleotides from 5' to 3' on the new strand 5' and as DNA is antiparallel!

- 1 The leading strand replicated continuously.
- 2 The lagging strand replicated in fragments.

Stage 5

Fragments in the lag strand are joined by the enzyme ligase.



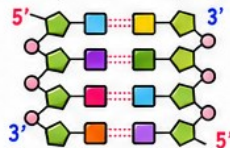
DNA structure & bonds

DNA Structure

2 strands of nucleotides that coil up to form a 3D structure called a double helix.

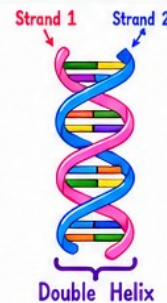
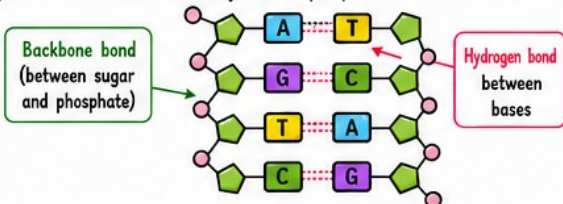
1st strand runs from 5' phosphate to 3' deoxyribose.

2nd strand runs from 3' deoxyribose to 5' phosphate.



Bonding in DNA

1. Weak hydrogen bonds between complementary bases hold two strands together.
2. Strong backbone bond between deoxyribose & phosphate.



Requirements for DNA Replication

- 1 Primers
- 2 Enzymes (DNA Polymerase and Ligase)
- 3 DNA Template
- 4 Free complementary DNA nucleotides
- 5 ATP

Primers

Short strand of nucleotides complementary to target DNA. ★

