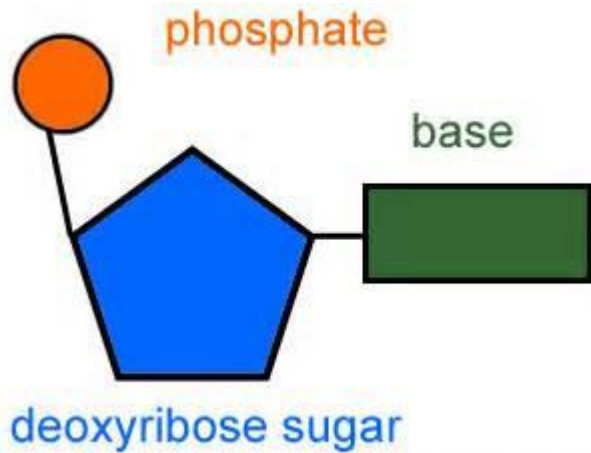
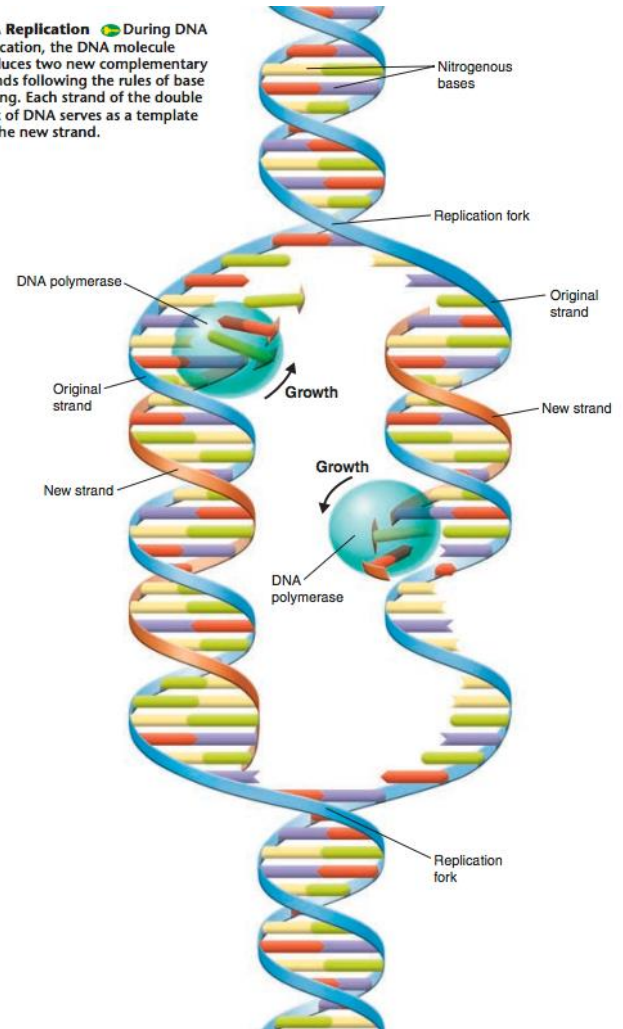


DNA and its Replication



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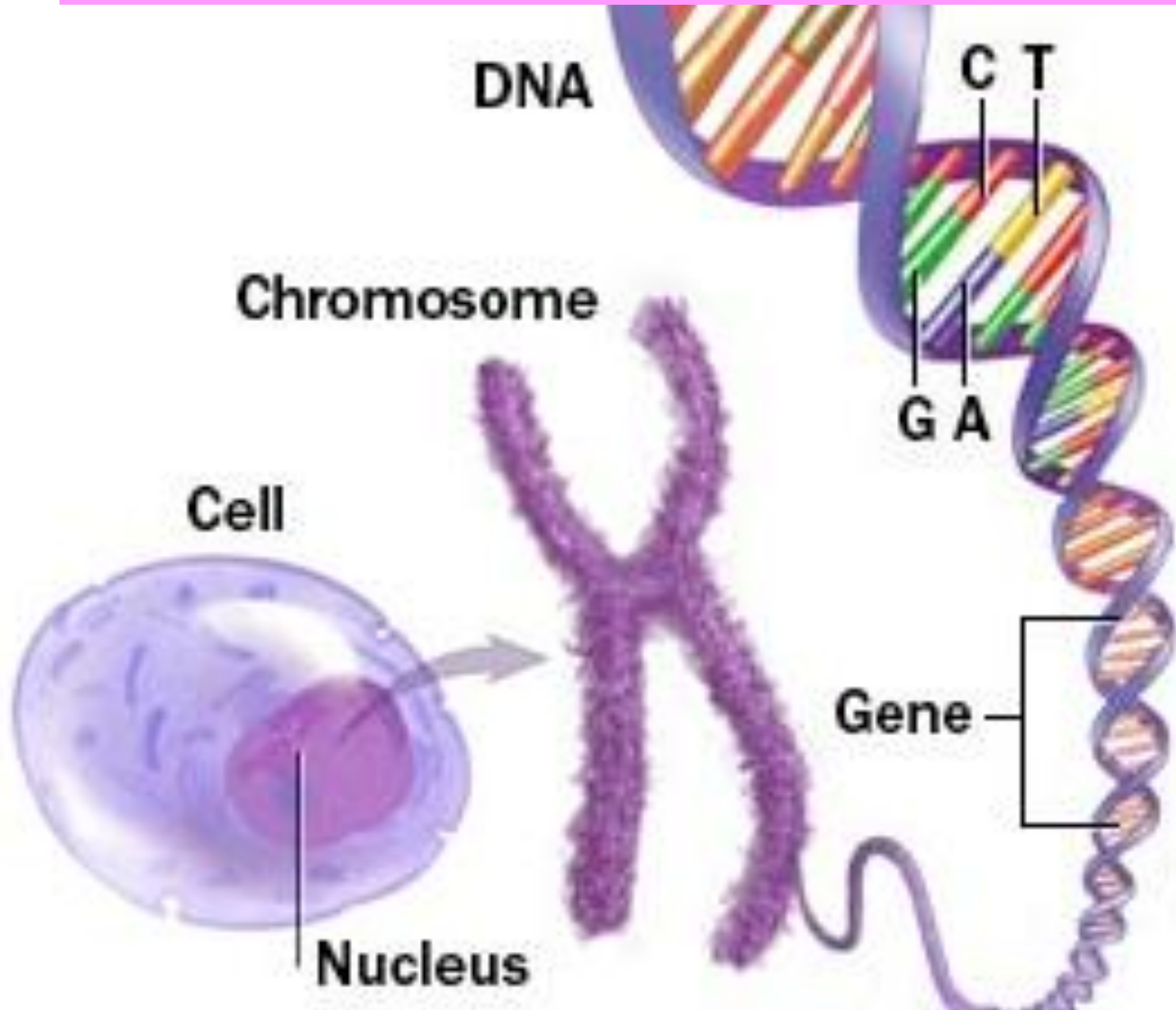
DNA Replication 🟢 During DNA replication, the DNA molecule produces two new complementary strands following the rules of base pairing. Each strand of the double helix of DNA serves as a template for the new strand.



I can describe the structure of DNA

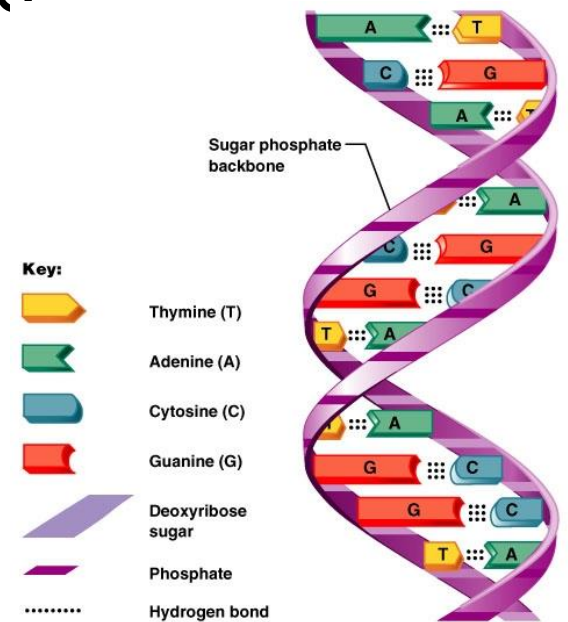
- Chromosomes are found in the NUCLEUS.
- They contain genetic information which code for PROTEINS.
- Chromosomes are made up of DNA (DEOXYRIBONUCLEIC ACID).
- DNA carries a copy of the genetic code, and the sequence of this determines the genotype of an organism.

I can describe the structure of DNA

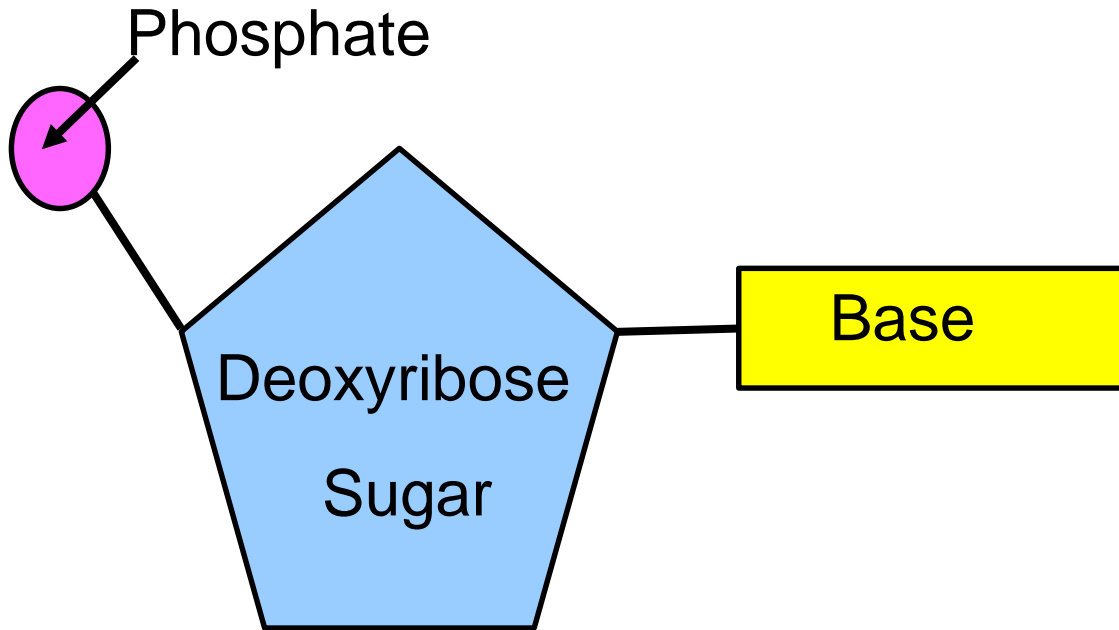


I can describe the structure of DNA

- DNA is a TWISTED DOUBLE HELIX.
- This means that it is double stranded.
- DNA is built from subunits called NUCLEOTIDES.

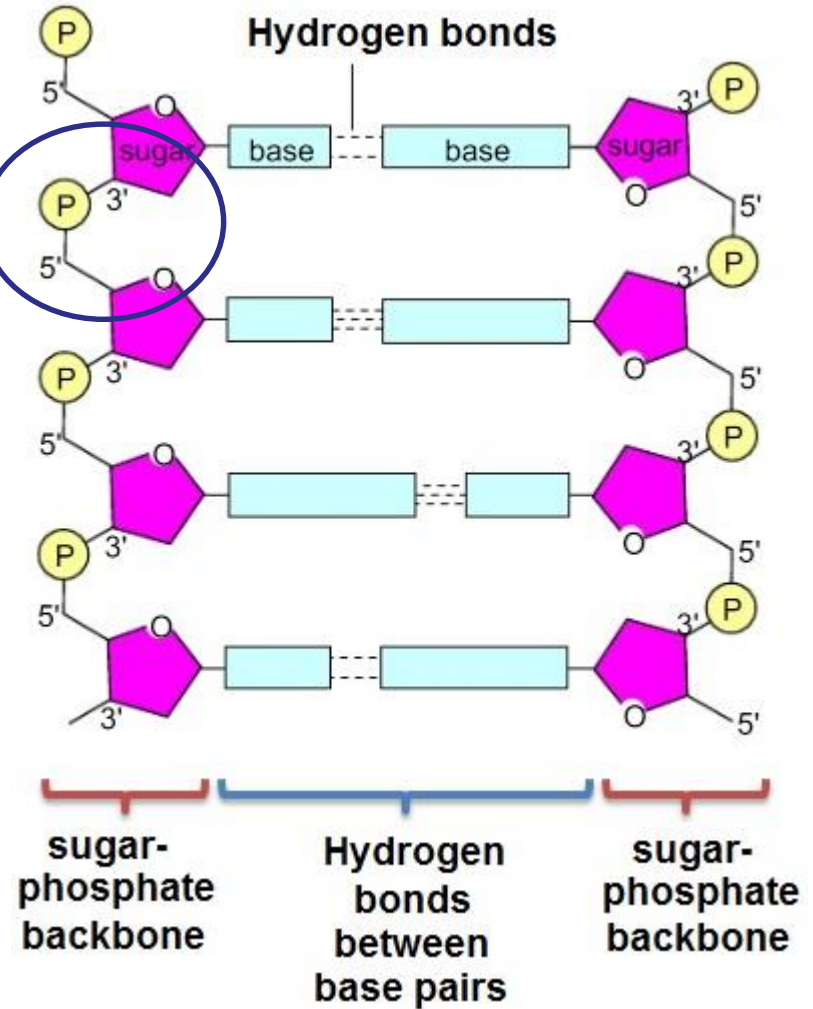


- A DNA nucleotide has 3 parts to it:



I can describe the structure of DNA

- The nucleotides join together between the deoxyribose sugar of one and the phosphate group of the next.

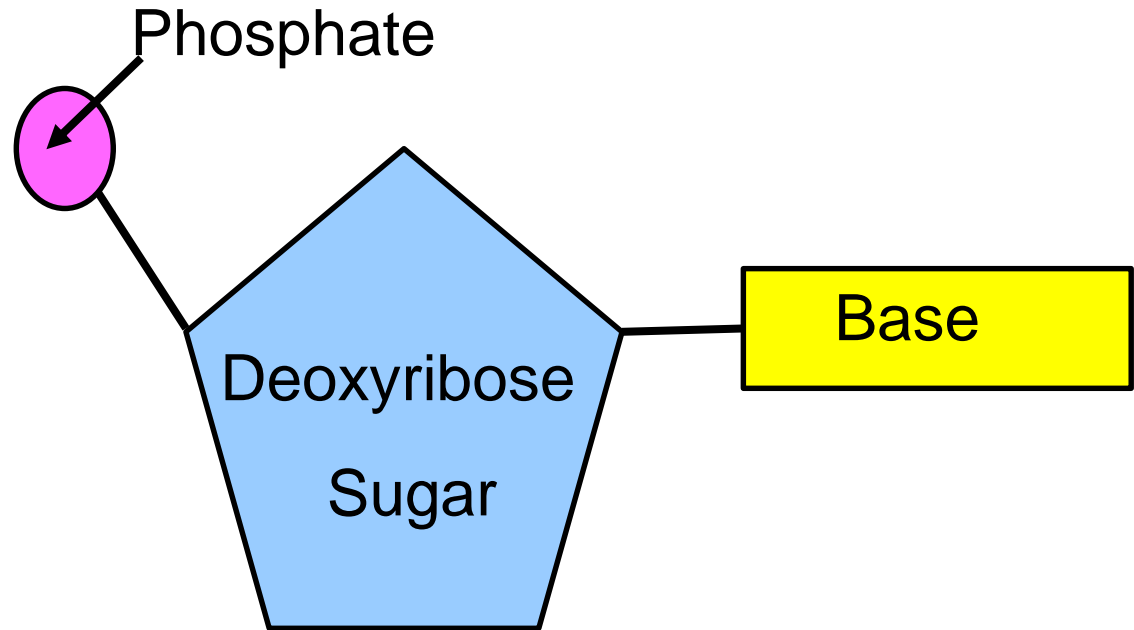


- This forms a **SUGAR PHOSPHATE** backbone

L.I. DNA
and its
replication

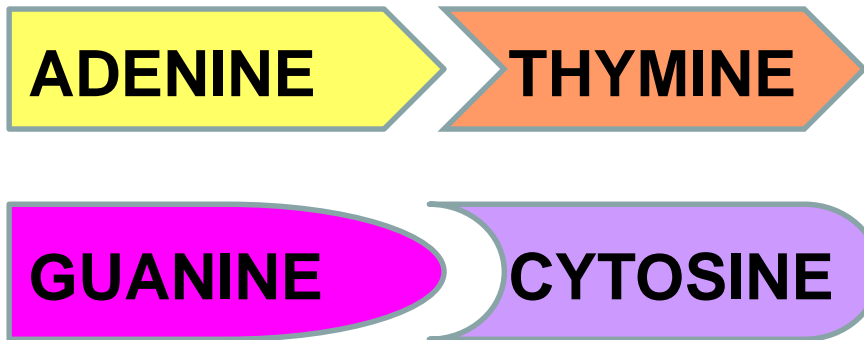
I can describe the structure of DNA

- There are 4 DNA bases:
- ADENINE (A)
- THYMINE (T)
- GUANINE (G)
- CYTOSINE (C)



I can describe the structure of DNA

- WEAK HYDROGEN BONDS between bases hold the two strands of the DNA together.
- The bases have a COMPLEMENTARY BASE PAIR which they always pair up with in DNA.

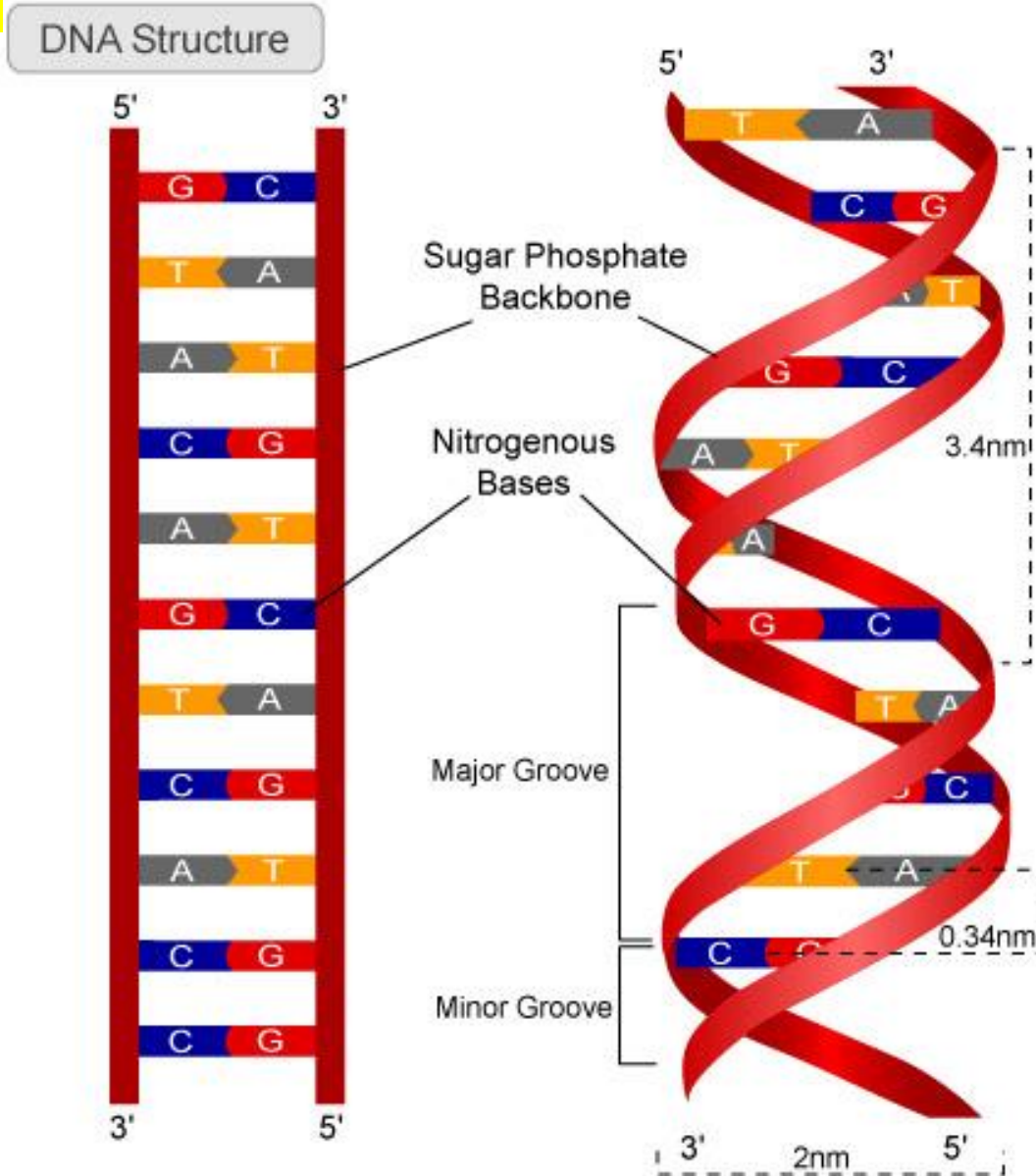


Cute Girls

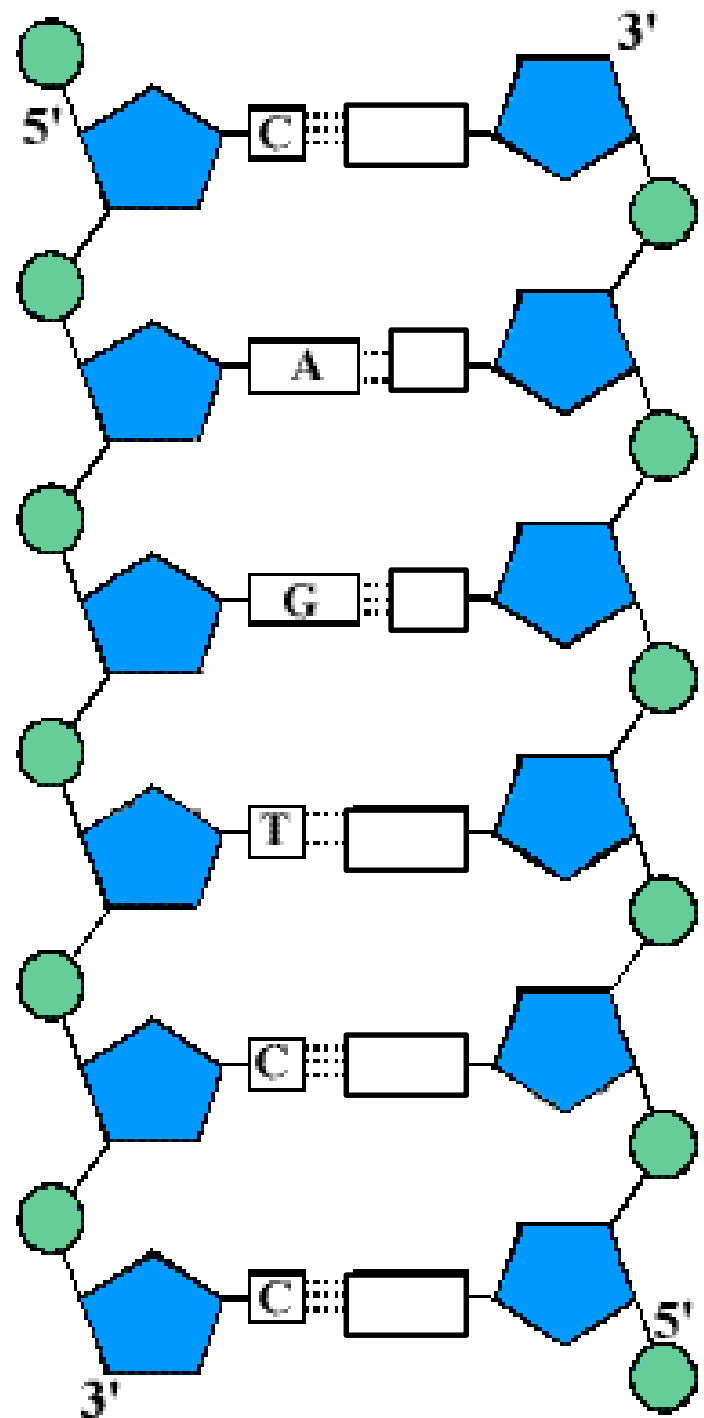
Are Thick

L.I. DNA and its replication

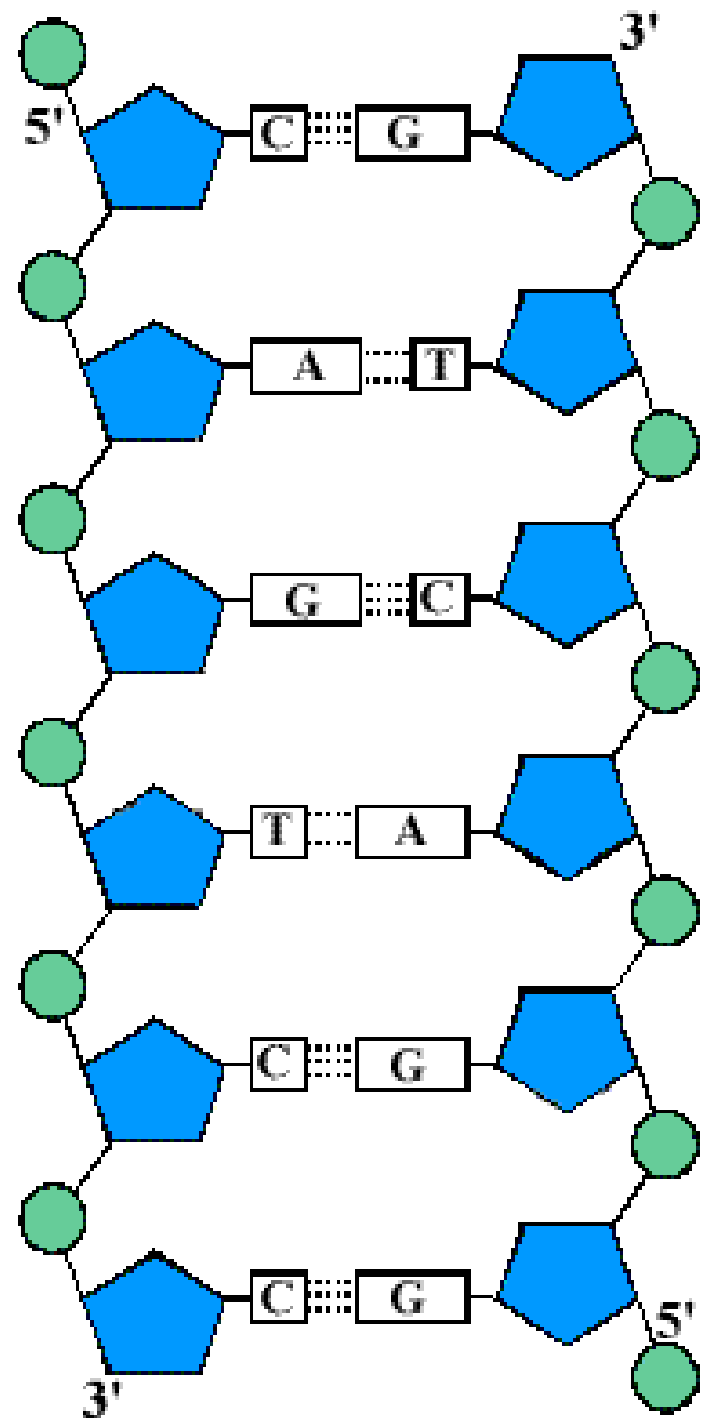
I can describe the structure of DNA



**Complete the
complementary base
pairings**

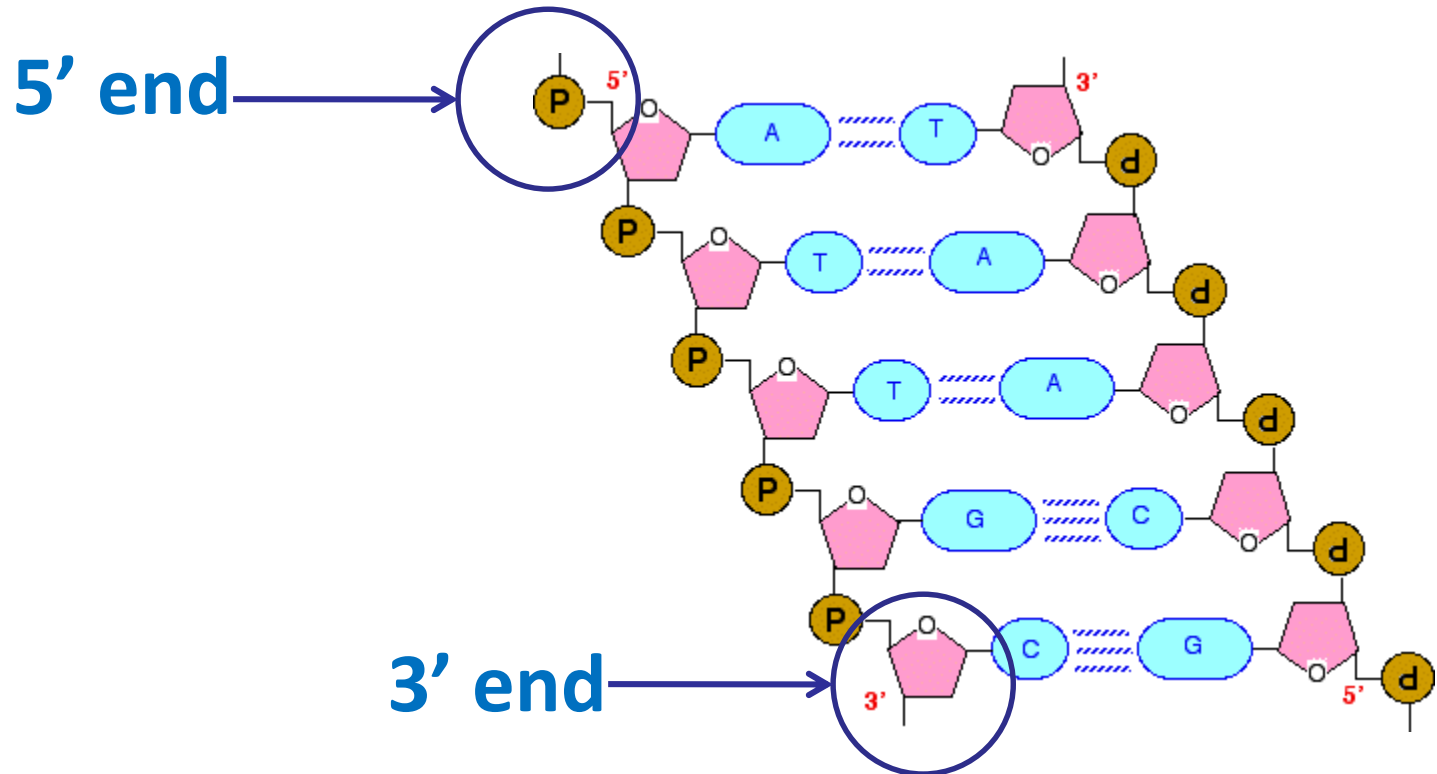


**Complete the
complementary base
pairings**



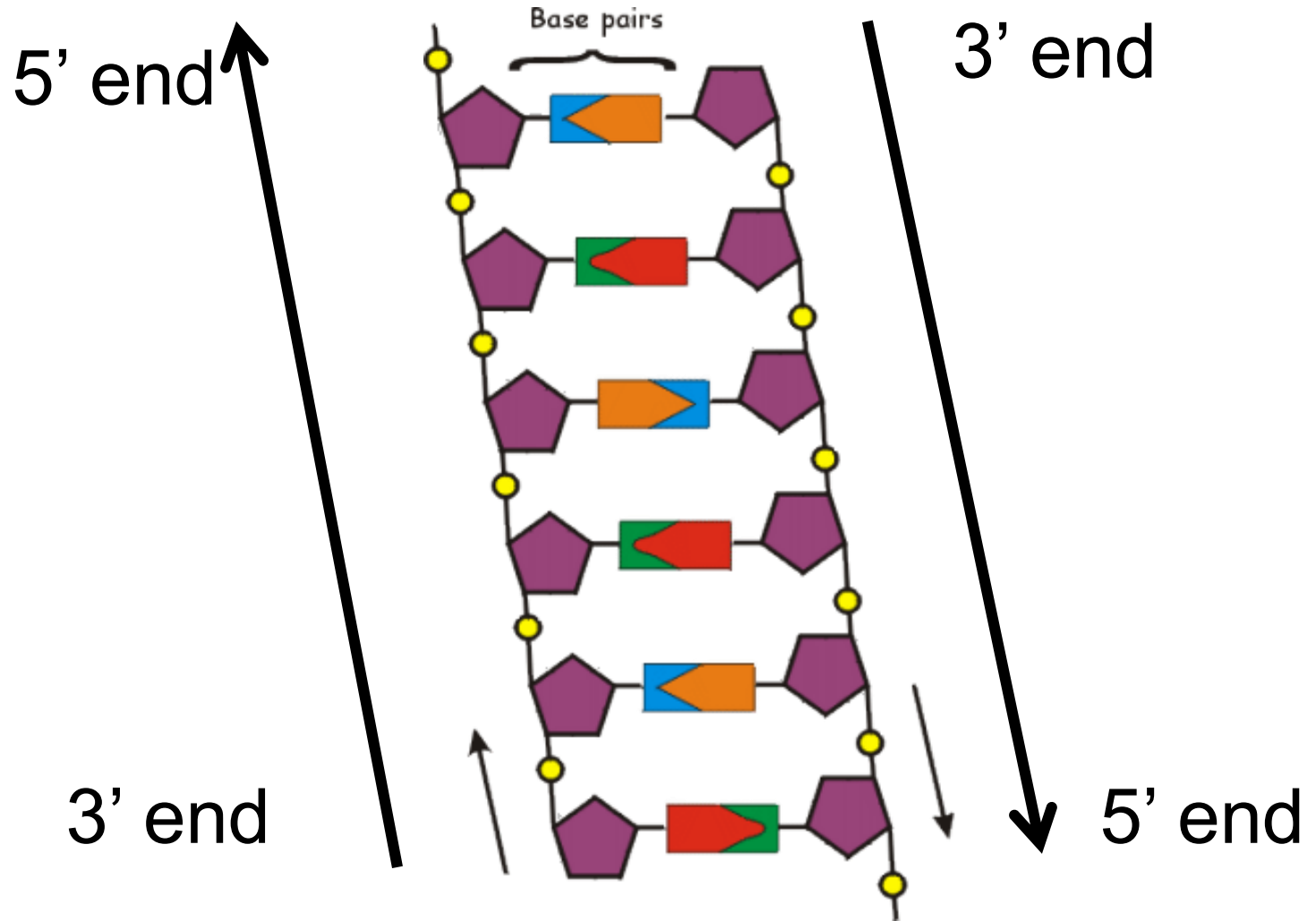
I can describe the structure of DNA

- DNA strands have 2 ends,
 - A 3' end with **DEOXYRIBOSE SUGAR** at the end and
 - A 5' end with **PHOSPHATE** at the end



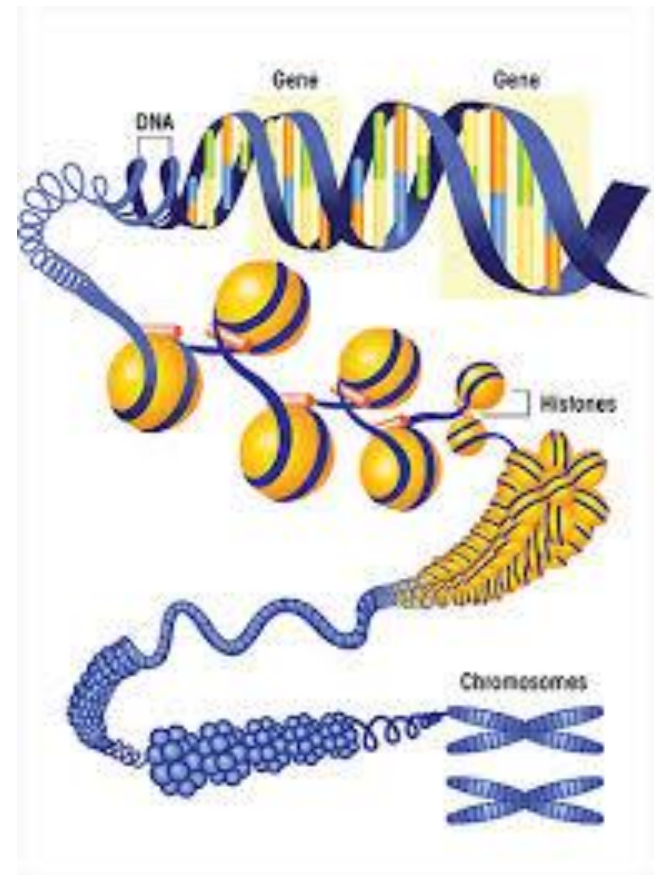
I can describe the structure of DNA

- DNA strands always run **ANTIPARALLEL** to each other.



- <http://www.dnalc.org/view/15483-DNA-packaging-3D-animation-with-basic-narration.html>

DNA strands are tightly coiled around bundles of proteins - like beads on a string- to prevent tangling.



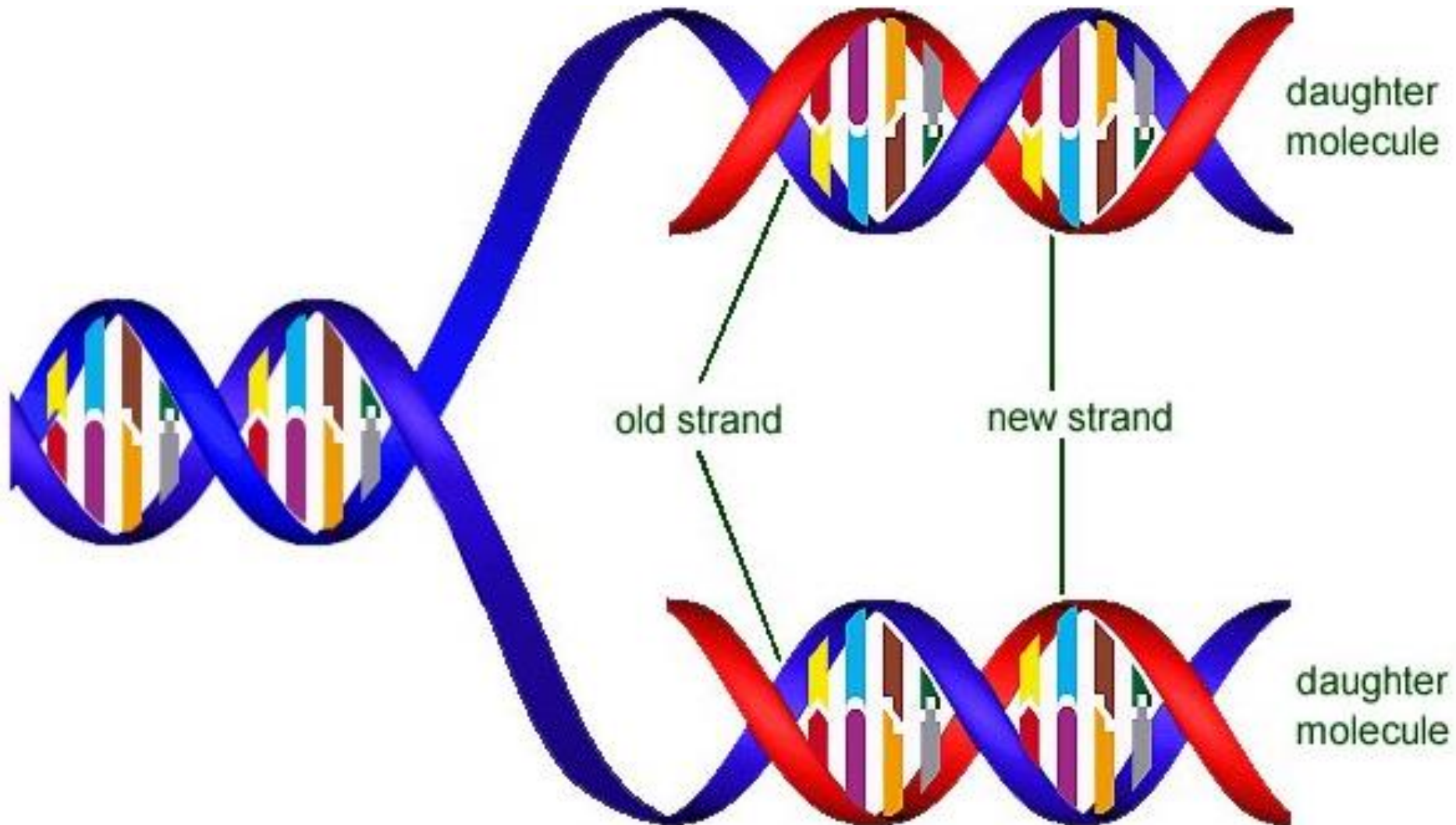
I can describe replication of DNA

- DNA can control its own replication.
- DNA replication takes place before MITOSIS or MEIOSIS and cell division.

I can describe replication of DNA

- 2 daughter molecules of DNA are produced from the original molecule of DNA.
- DNA replication is SEMI CONSERVATIVE.
- This means that each daughter molecule contains one strand from the original molecule and one newly synthesised strand.

Semi Conservative Replication of DNA

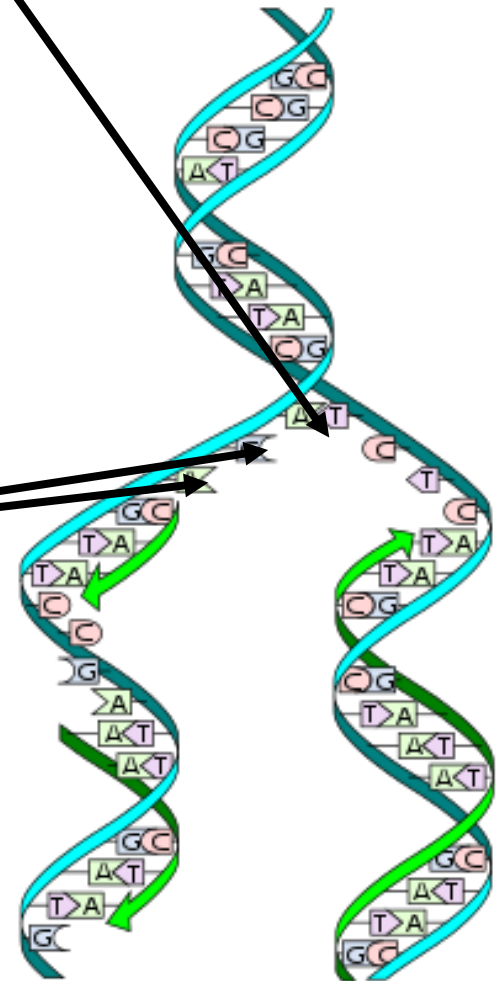


L.I. DNA
and its
replication

- <https://www.youtube.com/watch?v=27TxKoFU2Nw>

I can describe replication of DNA

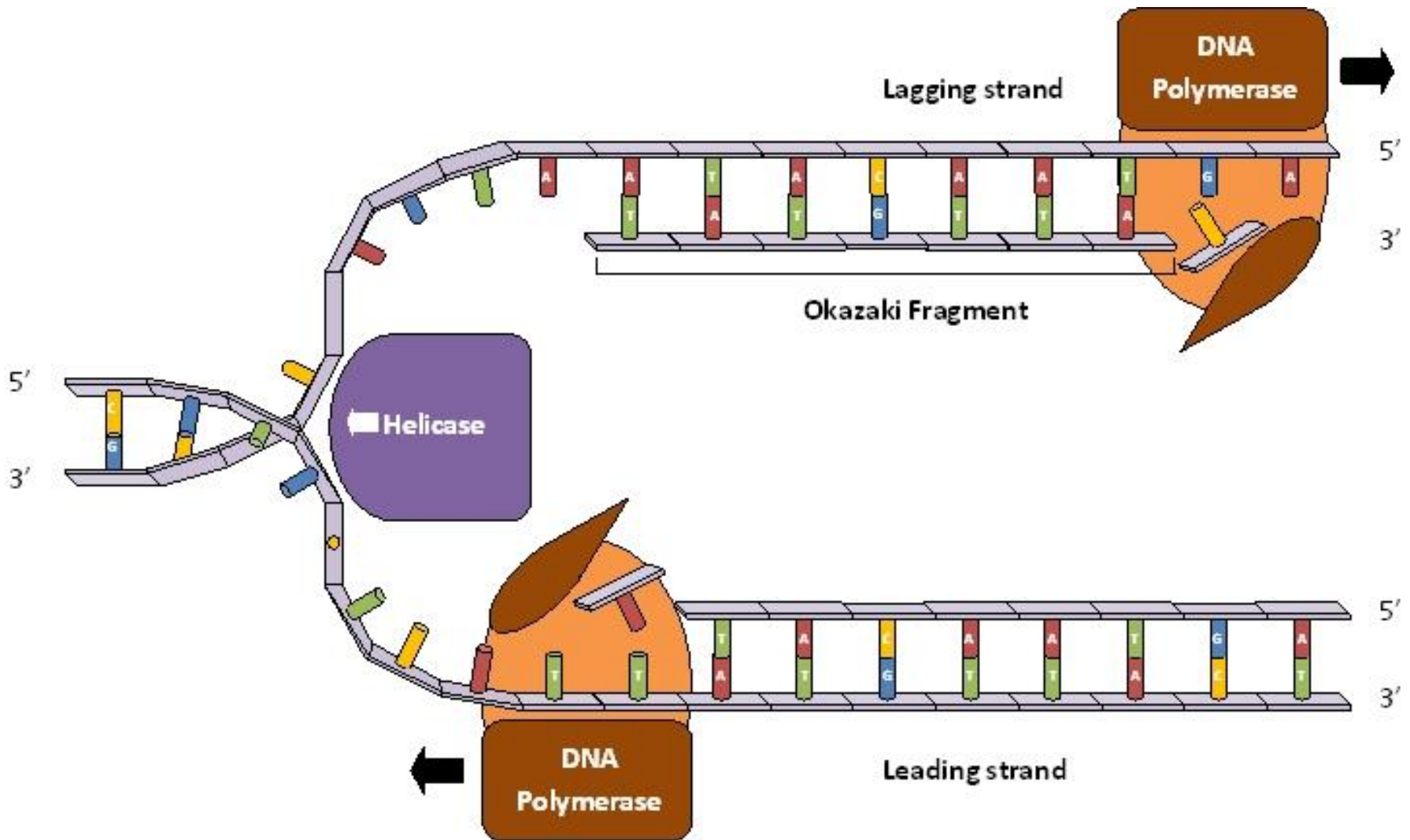
- DNA molecule UNWINDS and UNZIPS (hydrogen bonds break between nucleotides).
- This forms 2 template strands of DNA
- This exposes bases of the original DNA strands.



I can describe replication of DNA

- Free DNA nucleotides line up through **complementary base pairing** with a nucleotide on the DNA template strand.
- **Hydrogen bonds** form between base pairs.
- **DNA POLYMERASE** then forms the **sugar phosphate backbone** between the neighbouring nucleotides.

DNA replication key points



I can state the role of DNA Polymerase

- DNA polymerase replicates a DNA strand precisely using DNA nucleotides.
- DNA polymerase needs a primer to start replication.
- DNA polymerase adds complementary nucleotides to the deoxyribose 3' end of the DNA strand
- DNA polymerase can only add nucleotides in one direction.

I can describe replication of DNA

- This process occurs at **several** locations on a DNA molecule.
- So the two strands are replicated differently.
- The **LEADING STRAND** is replicated **continuously**
- The **LAGGING STRAND** is **replicated in fragments.**

- The fragments produced in the lagging strand are then joined together with the enzyme LIGASE.

DNA replication summary diagram

