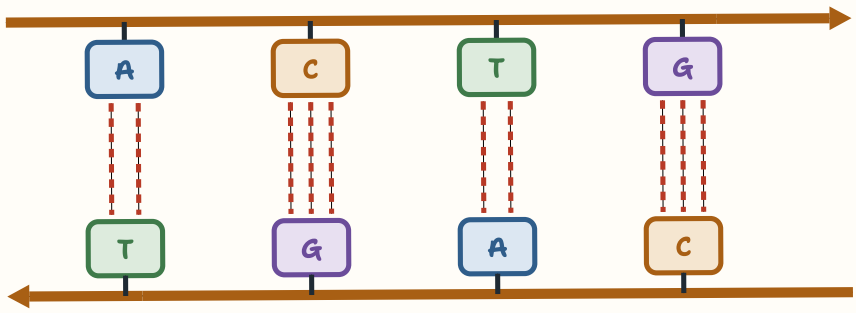
# DNA Double Helix and Phosphodiester Bonds

Phosphodiester bonds along each strand, hydrogen bonds between them.




A with T (two H bonds) C with G (three H bonds)

## Key terms

| | |
|---|---|
| **phosphodiester bond** | forms by condensation between the phosphate group of one nucleotide and the pentose sugar of the next. |
| **polynucleotide** | a long chain of nucleotides with a sugar-phosphate backbone. |
| **antiparallel** | the two strands run in opposite directions. |
| **complementary base pairing** | adenine with thymine (two hydrogen bonds), cytosine with guanine (three). |
| **hydrogen bond** | holds the two strands together; weak singly, but many make the molecule stable. |
| **double helix** | two polynucleotide chains twisted together, with the bases pointing inwards. |

## I can...

- [ ] Condensation between two nucleotides forms a phosphodiester bond
- [ ] DNA is a double helix of two polynucleotide chains held by hydrogen bonds between specific complementary base pairs
- [ ] RNA is a relatively short polynucleotide chain
- [ ] Appreciate that DNA's relative simplicity led scientists to doubt it carried the genetic code

**EXAM TRAP**

Phosphodiester bonds run along each strand; hydrogen bonds link the two strands. Never say hydrogen bonds join the nucleotides in one strand.

## 4 marks: what earns them

1. Two polynucleotide chains / strands arranged as a double helix
   Not: 'double helix' alone with no two strands; 'two strands of amino acids'
2. Nucleotides in each strand joined by phosphodiester bonds (between phosphate and pentose sugar)
   Not: 'peptide bonds'; 'hydrogen bonds between nucleotides in a strand'; 'glycosidic bonds'
3. The two strands held together by hydrogen bonds between bases
   Not: 'covalent bonds between the strands'; 'ionic bonds between bases'; 'hydrogen bonds in the backbone'
4. Complementary base pairing: adenine with thymine, cytosine with guanine
   Not: 'A with G'; 'A with U' in DNA; 'adenine pairs with cytosine'

**Remember**

Phosphodiester: along the strand, builds the backbone.

Hydrogen: across, pairs the bases.

A with T, C with G. Never A with G.



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