STRUCTURE OF DNA

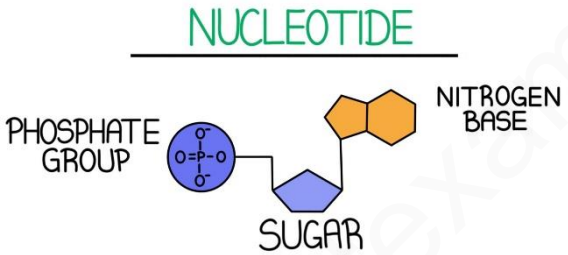
(a) two strands coiled together to form a double helix

(b) each strand contains chemicals called bases

(c) bonds between pairs of bases hold the strands together

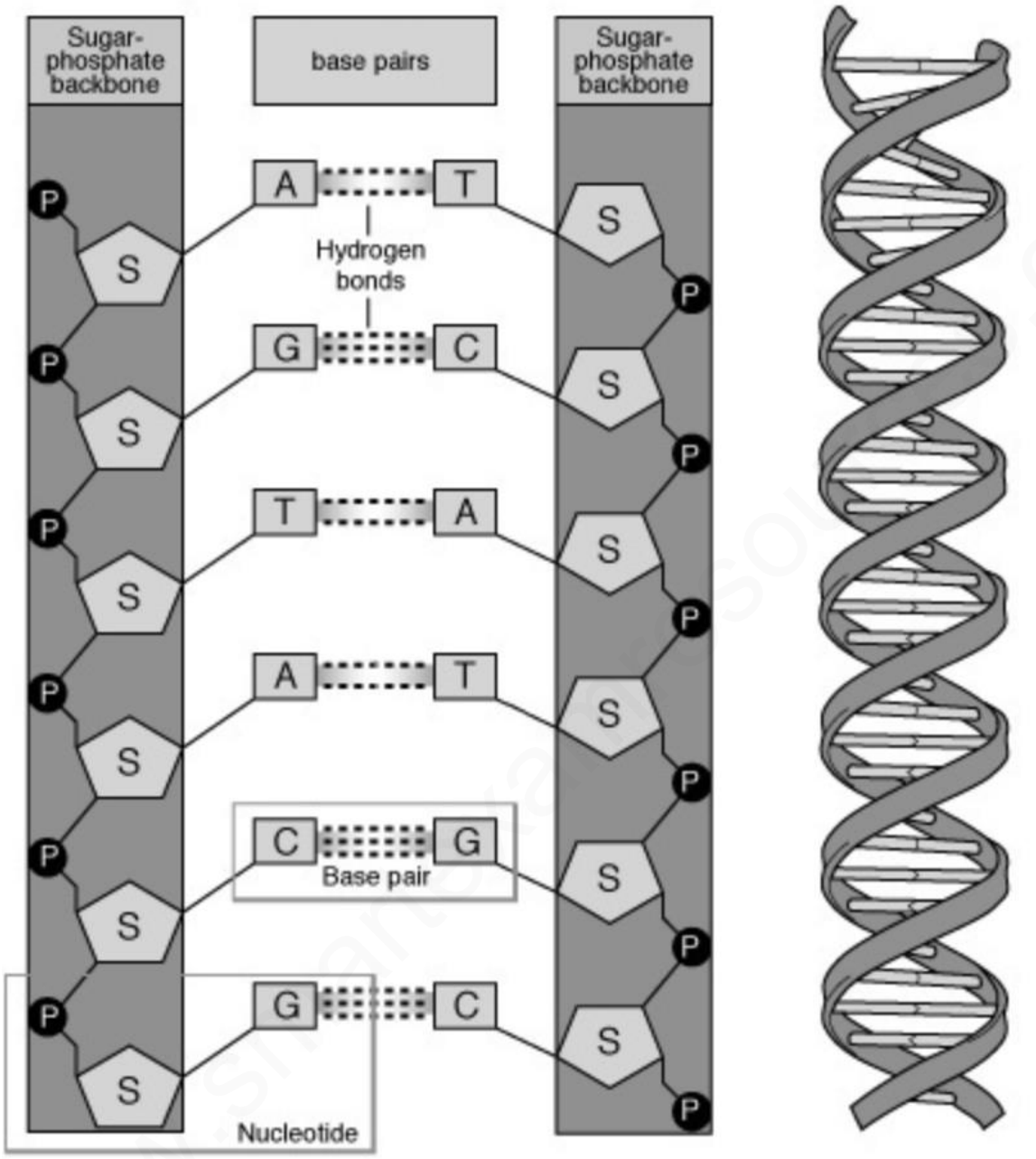
(d) the bases always pair up in the same way: A with T, and C with G (full names are **not** required)

- DNA is made up of two strands that are twisted around each other to form a double helix.
- Each strand consists of nucleotides joined to each other by covalent bonds.



- The two strands are joined together by the complementary base pairing.
- There are in all 4 bases, namely: Adenine**(A)**, Guanine**(G)**, Cytosine**(C)** and thymine **(T).**
- Base-pairing takes place where; **A pairs with T, and G pairs with C**. In other words, adenine and thymine are complementary base pairs, and cytosine and guanine are also complementary base pairs.

- The bonding between the strands creates a double helix structure as shown below.



- The structure is said to consist of a sugar phosphate backbone.

BOARD QUESTION:

(c) Proteins and DNA are important nitrogen-containing compounds in cells.

Describe the roles of proteins and DNA in cells.

proteins .....

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..... [3]

DNA .....

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..... [2]

MARKING SCHEME:

(c)	*proteins in* ***cells***		
1	enzymes ;		
2	control / catalyse, reactions / AW ;		
3	e.g. respiration / photosynthesis ; **A** ref. to any specific reaction(s)		**R** digestion unless clearly **inside** cell, e.g. in a phagocy
4	(part of cell) membranes ;		**A** protein pumps
5	carrier proteins / description of role allowing movement in and out of cell ;		**R** antibodies / hormones / collagen / keratin
6	haemoglobin ;		
7	transport of, oxygen / carbon dioxide / gases ;		
8	making cytoplasm / (cell) growth ;		
9	AVP ; e.g. chloroplast / named organelle / providing energy	[max 3]	***ignore*** repair **R** produce / make energy
10	*DNA in* ***cells***		
11	ref. to, genes / alleles / genetic information / genetic code ;		
12	control functions of the cell ;		**R** hereditary material / AW
13	code for proteins ;		**A** 'sends messages to the cytoplasm' / 'tells the cells what to do'
	AVP ; e.g. a specific feature of cells / cell division / mitosis / meiosis	[max 2]	**A** ref. to mRNA