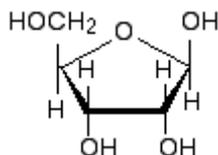


## Chemguide – questions

### DNA: STRUCTURE

1. DNA consists of a double helix consisting of two chains made up of alternating phosphate and sugar groups to which are attached bases. The sugar is deoxyribose.

a) Ribose has the structure:



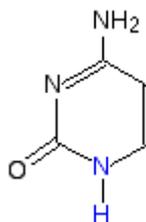
Draw the structure of deoxyribose.

b) The carbon atoms are numbered from 1' to 5'. Show the numbering on your diagram.

c) The phosphate group is attached to the 5' carbon. Draw a diagram to show the phosphate group attached to the deoxyribose.

d) Which carbon atom is the base attached to?

e) One of the bases which could be attached is cytosine:



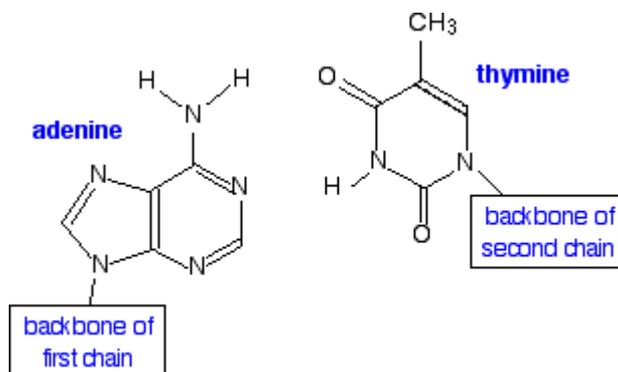
Draw the structure of the molecule formed when cytosine attaches to your structure in part (c).

(You may want to flip the cytosine structure over to make it fit better in your diagram.)

f) The structure you should have drawn is a nucleotide. DNA consists of a string of nucleotides joined together. Draw a diagram of the structure produced by joining two nucleotides together. To make it simpler, just write the word "base" instead of drawing the whole structure of, say, cytosine.

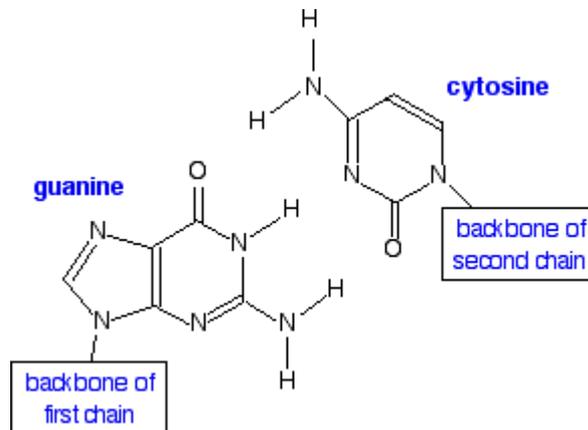
2. The two strands of the DNA double helix are held together by attractions between the bases on each strand.

a) Adenine always pairs with thymine. Using the diagram below (taken from the Chemguide page) show the attractions between the two bases, and explain their origins.

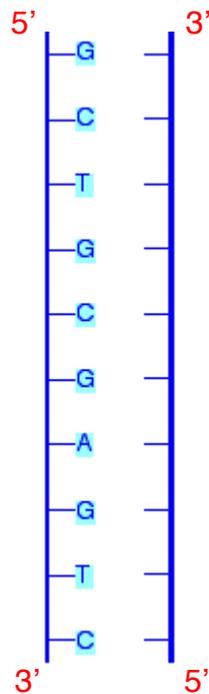


## Chemguide – questions

b) Guanine always pairs with cytosine. In a similar way, show the attractions between these two bases, and explain their origins.



c) The diagram below shows a small part of a DNA molecule. It shows the sugar-phosphate chains with the bases shown on one of the chains. Complete the diagram to show the corresponding bases on the other chain.



d) What does the labelling in red show?