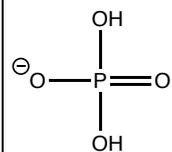
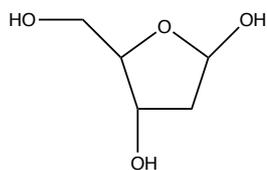




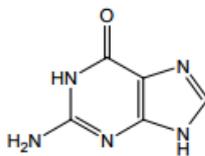
# DNA PROBLEMS



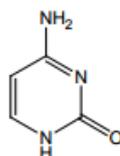
phosphate



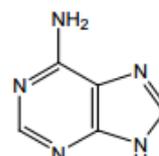
2-deoxyribose



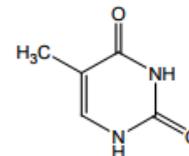
guanine (G)



cytosine (C)



adenine (A)

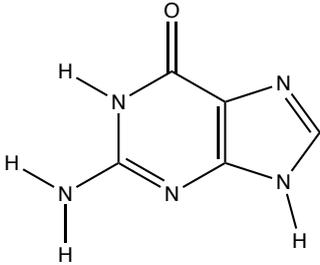
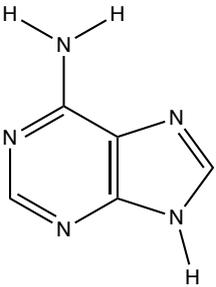


thymine (T)

- 1 Sketch part of the DNA backbone showing two phosphate units joined to two 2-deoxyribose units.

- 2 At the top of the page, circle the N atoms on the four bases through which they bond to the 2-deoxyribose units.

3	Sketch the nucleotide containing one phosphate, one 2-deoxyribose and one guanine unit.
4	Sketch the nucleotide containing one phosphate, one 2-deoxyribose and one cytosine unit.
5	Sketch the nucleotide containing one phosphate, one 2-deoxyribose and one adenine unit.
6	Sketch the nucleotide containing one phosphate, one 2-deoxyribose and one thymine unit.

7	DNA consists of two strands each made of nucleotides. What holds the two DNA strands together?
8	Explain why the interaction between cytosine and guanine units is stronger than that between an adenine and a thymine unit.
9	<p>Sketch how a cytosine unit hydrogen bonds to this guanine unit.</p>  <p>The image shows the chemical structure of Guanine, a purine base. It consists of a fused bicyclic ring system: a six-membered imidazole ring fused to a five-membered imidazole ring. The six-membered ring has a carbonyl group (=O) at the 6-position and an amino group (-NH<sub>2</sub>) at the 2-position. The five-membered ring has a hydrogen atom on the nitrogen at the 1-position.</p>
10	<p>Sketch how a thymine unit hydrogen bonds to this adenine unit.</p>  <p>The image shows the chemical structure of Adenine, a purine base. It consists of a fused bicyclic ring system: a six-membered imidazole ring fused to a five-membered imidazole ring. The six-membered ring has an amino group (-NH<sub>2</sub>) at the 6-position. The five-membered ring has a hydrogen atom on the nitrogen at the 1-position.</p>

11	Draw one 2-deoxyribose unit and show how the C atoms are numbered.
12	Scientists talk about '3 prime' and '5 prime' ends in DNA. What do these terms refer to?
13	Draw <i>cis</i> -platin.
14	Explain how <i>cis</i> -platin stops DNA replication and so can act as an anti-cancer drug.
15	Draw <i>trans</i> -platin and explain why this would not stop DNA replication.