





## Structure of DNA – The WATSON-CRICK DNA MODEL


### Procedure:

Familiarize yourself with each of the following components of the **3 chemical groups** and the hydrogen bond:

#### 1 Nitrogen Bases (rungs) represented by these color coded tubes

	BLUE	Cytosine (C)	Pyrimidine (single ring)
	GREEN	Thymine (T)	Pyrimidine (single ring)
	ORANGE	Adenine (A)	Purine (double ring)
	YELLOW	Guanine (G)	Purine (double ring)

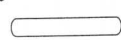
#### 2 Phosphate group (sides of the ladder)

	WHITE	White tube
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#### 3 Deoxyribose sugar group 5-carbon sugar (on sides of the ladder)

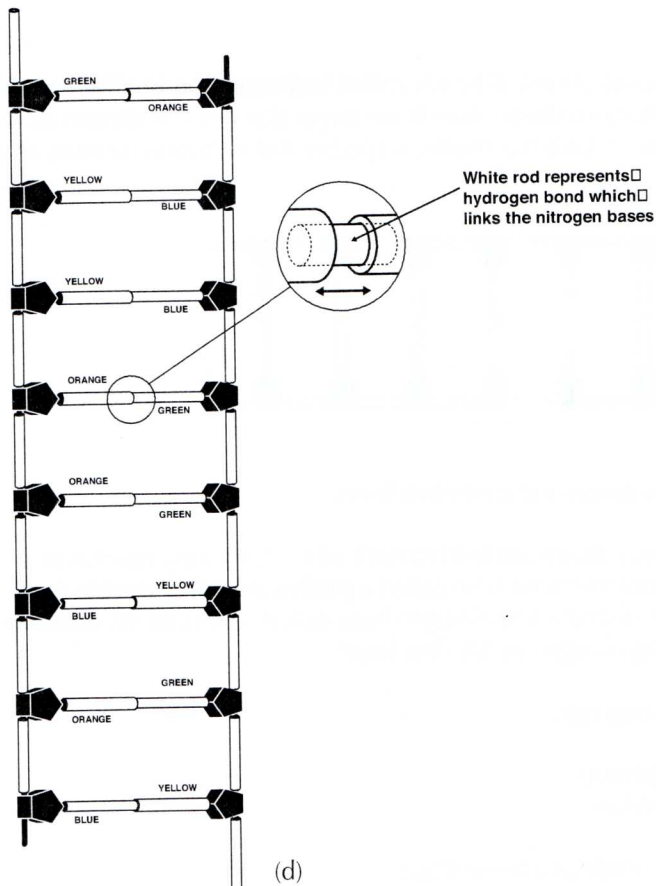
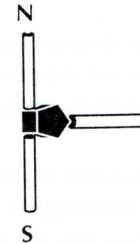


black linkage



Hydrogen bond (white rod that links the nitrogen bases)

- Construct a ladder by first joining the sugar and phosphate groups to make the sides of the ladder (see a). Place a white tube on the north and south posts of the sugar unit. Make two sides each with 8 sugar units and the phosphate groups (white tubes). Each post on the sugar unit represents a covalent bond.



- Next construct the nitrogen bases making sure you follow the *base-pairing rule*. (see b) (**AT** or **TA**) Attach orange and green tubes with the hydrogen bond (white rod). Then (**CG** or **GC**) Attach blue and yellow tubes with hydrogen bonds. Attach each pair of tubes to east post of the sugar unit if left side (west post if right side) of ladder. See illustration below and construct your model using the same combinations or code. (As in illustration d).

Study the diagram of a segment of the DNA. Note that the **guanine** (yellow tube) is always linked to **cytosine** (blue tube). **Thymine** (green tube) is always connected to **adenine** (orange tube). While only certain pairs of nitrogen based nucleotides can be linked to one another, the order of the combinations of these pairs occur in many different arrangements or sequences. These combinations or sequences determine the characteristics of living things, the *genetic code*. This is why DNA testing is widely used to identify individuals in criminal cases and also identifying pathogens, when diagnosing diseases.