

★ **HIGHER TIER ONLY** content is highlighted in blue. Foundation students — focus on the un-highlighted sections.

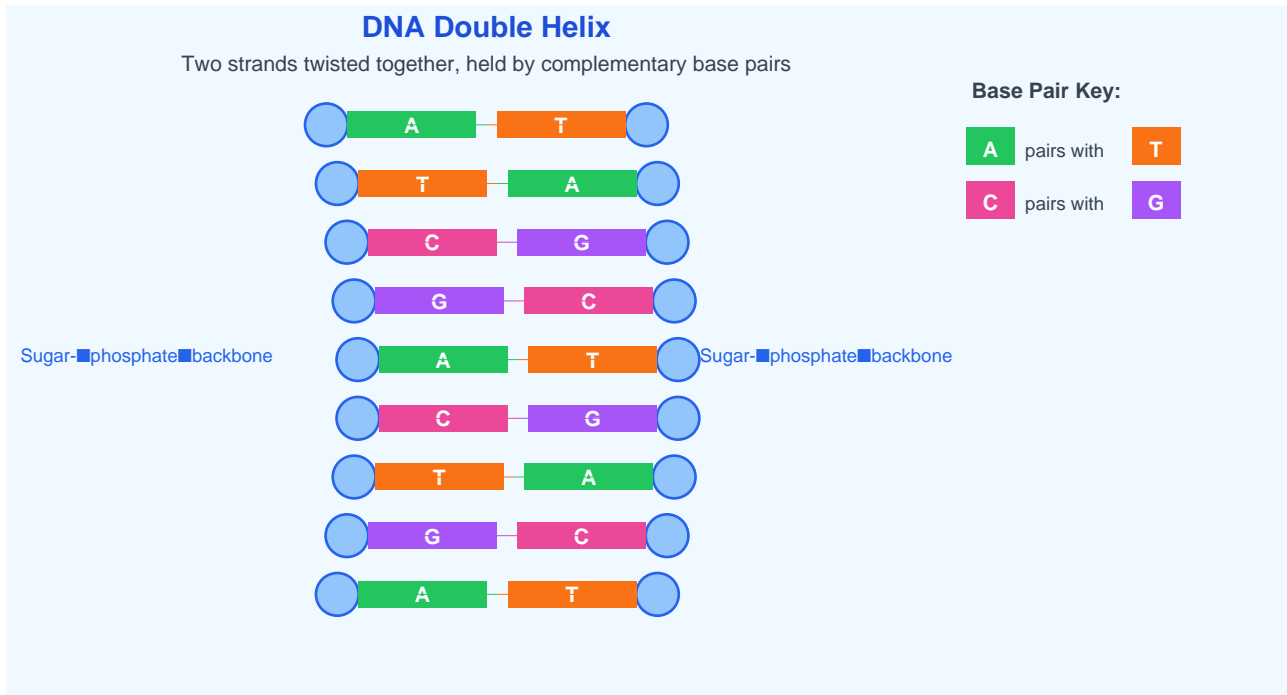


Fig: Simplified DNA structure — A pairs with T, C pairs with G (complementary base pairing)

### Punnett Square: Cystic Fibrosis Cross (Ff x Ff)

F = normal (dominant) f = cystic fibrosis allele (recessive)

		F Parent 1 (Ff) f	
P2 Ff	F	<b>FF</b> Normal (homozygous)	<b>Ff</b> Normal (carrier)
	f	<b>Ff</b> Normal (carrier)	<b>ff</b> Cystic Fibrosis

**Results:**

- 1 FF (normal, homozygous)
- 2 Ff (normal, carrier)
- 1 ff (cystic fibrosis)

**&#8594; 75% unaffected**

**&#8594; 25% affected**

Fig: Punnett square for two carrier parents (Ff x Ff) — shows inheritance of cystic fibrosis

★ **HIGHER TIER ONLY:** Protein synthesis: Transcription (nucleus) → mRNA leaves → Translation at ribosome → Protein chain assembled from amino acids coded by codons (3 bases = 1 amino acid).

<b>Mutation</b>	A random change in DNA base sequence — can be beneficial, harmful or neutral
<b>Continuous variation</b>	Characteristic with a range of values — controlled by many genes + environment (e.g. height)
<b>Discontinuous variation</b>	Characteristic with distinct categories — usually one gene (e.g. blood type)