6 DNA and making proteins – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	Write it 3 times (English)		
double helix			
complementary base pairing			
semiconservative replication			
Transcription			
Translation			
ribosome			
codons			

Recall

You already know the basics of DNA:

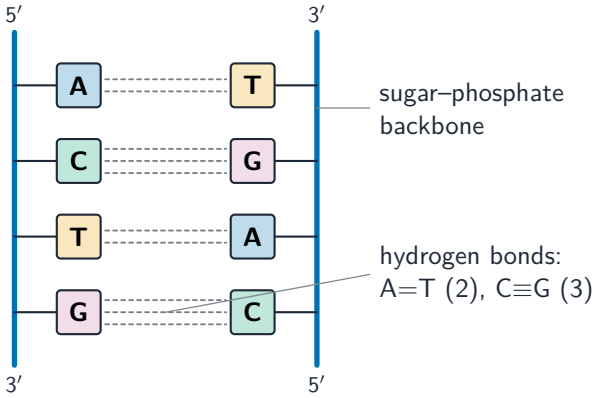
- DNA carries the genetic instructions, in a shape called the **double helix**.
- Its bases pair in a fixed way: A with T, and C with G.
- DNA codes for proteins.

This sheet lines up how a cell reads DNA to build proteins. Each idea has a short worked example.

New ideas

1 DNA structure

DNA is a **double helix** of two strands. The bases pair by rule – A with T, C with G – called **complementary base pairing**. So one strand tells you the other.



the two strands run in opposite directions (antiparallel)

2 DNA replication

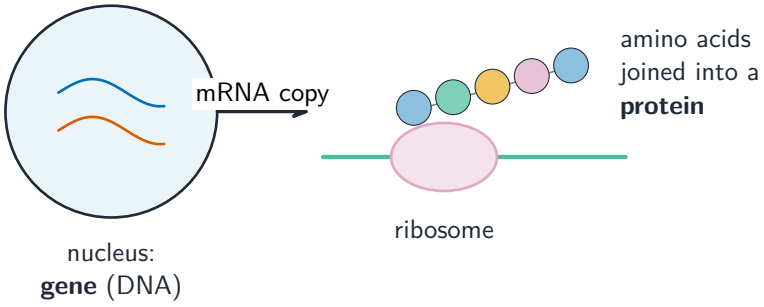
Before a cell divides, DNA is copied by **semiconservative replication**: the helix unwinds and each old strand acts as a template for a new one, so each new helix has one old and one new strand.

3 Transcription

Transcription copies a gene from DNA into a messenger molecule, mRNA. Note that RNA uses the base U (uracil) in place of T, and is single-stranded.

4 Translation

Translation builds a protein from the mRNA at the **ribosome**. The mRNA is read in three-base groups called **codons**, each choosing one amino acid. The overall flow is the "central dogma": DNA → RNA → protein.



Watch out: RNA is **single-stranded** and uses **U** (uracil) instead of the T found in DNA. Don't carry the DNA rules straight over to RNA.

Practice

Try these in order. The methods are all above.

2.1 In DNA, state which base pairs with (a) A, (b) G. [2]

2.2 A DNA strand reads A–T–C–G. Write the sequence of the complementary strand. [2]

2.3 State what happens during transcription. [2]

2.4 State what a codon is and what it codes for. [2]

2.5 State two ways RNA differs from DNA. [2]

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