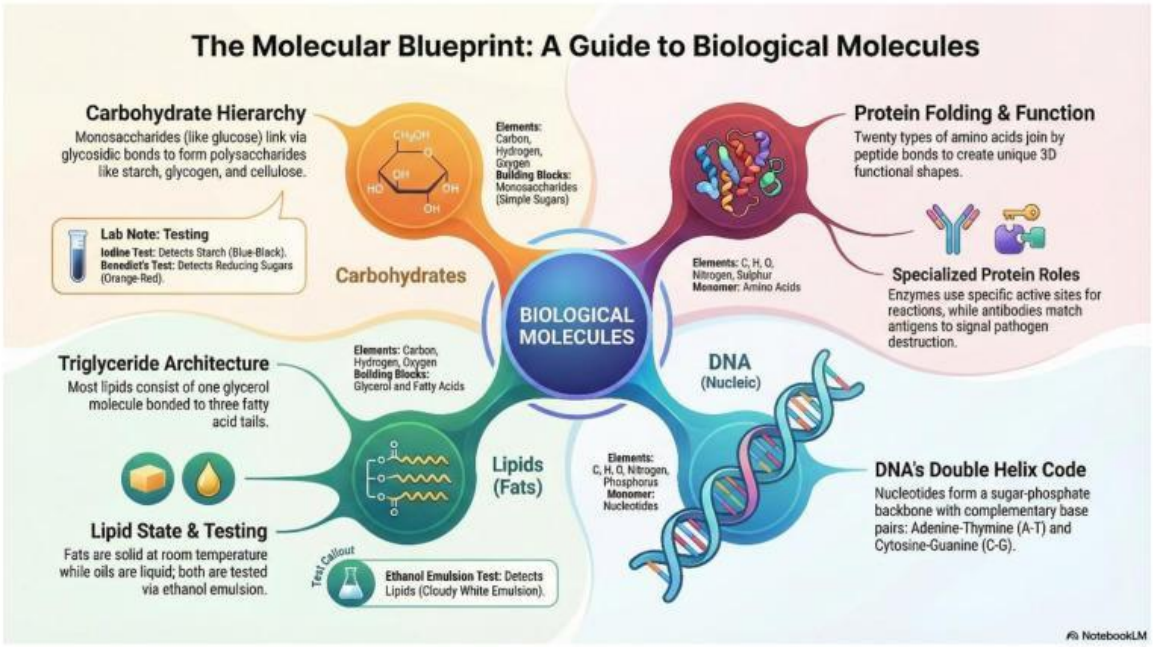
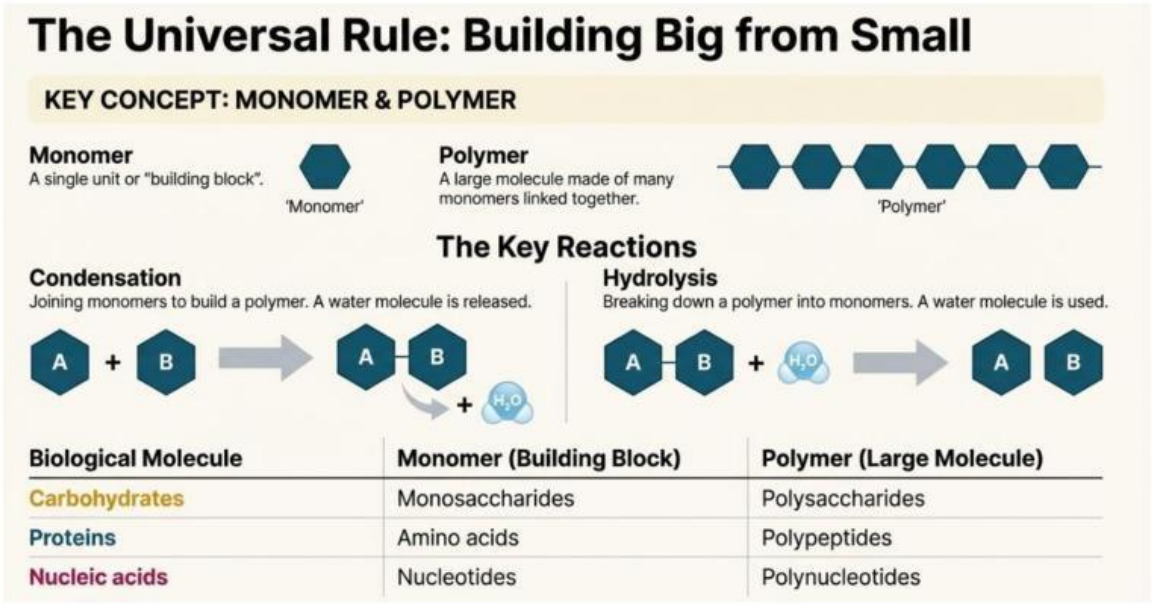
Chap 4 Anki

Biological Molecules





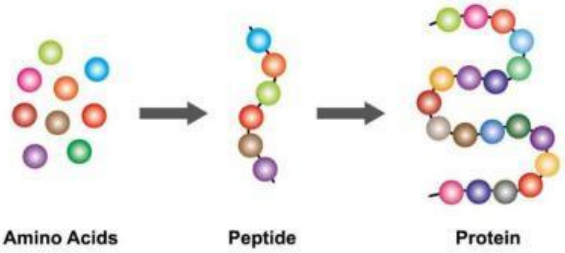
Biological Molecule	Monomer (Building Block)	Polymer (Large Molecule)
Carbohydrates	Monosaccharides	Polysaccharides
Proteins	Amino acids	Polypeptides
Nucleic acids	Nucleotides	Polynucleotides

Monomer	Polymer
1. **Glucose**, fructose	1. **Starch**, glycogen, cellulose (Polysaccharide)-insoluble
2. Amino acid	2. Protein
3. **3 Fatty acid,** 1 glycerol	3. Oil/ Fats (1 Triglycerides)

4. nucleotides	4. DNA/RNA (nucleic acid)

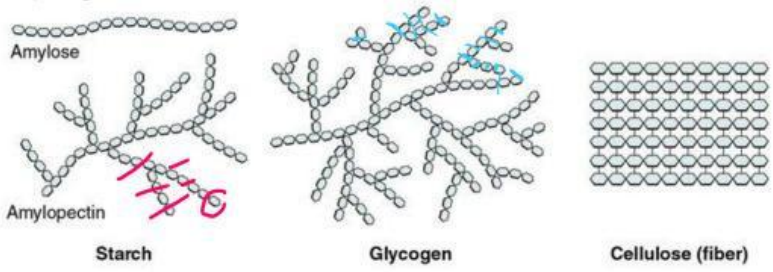
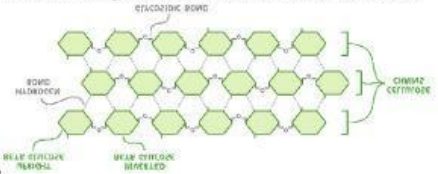
Intestine villi can only absorb monomer forms of nutrient molecules.

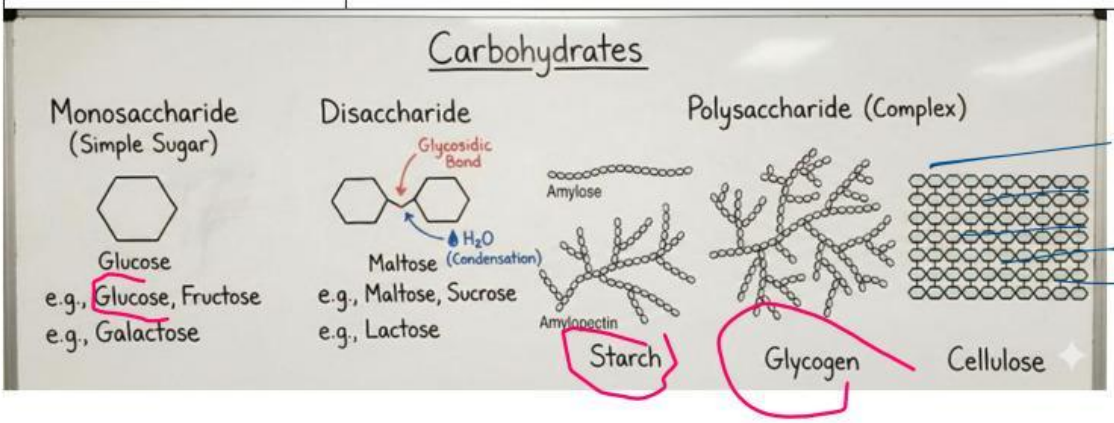
Building Blocks & Elements

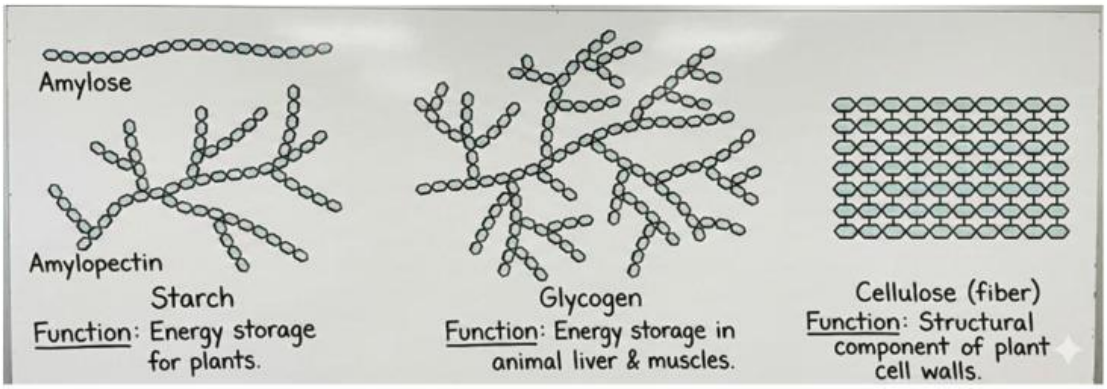
Give examples of biological molecules	The main types of biological molecules are **carbohydrates, proteins, fats, and DNA**.
What are **protein**s made of? 蛋白质是由什么构成的? Polypeptide chain will fold to become protein	**Amino acids** 氨基酸。  Example of protein: **enzymes**, antibody,
What are fats made of?	Fatty acids and glycerol.
State the elements found in starch.	Carbon (C), Hydrogen (H), Oxygen (O).
State the elements found in glucose.	Carbon (C), Hydrogen (H), Oxygen (O).

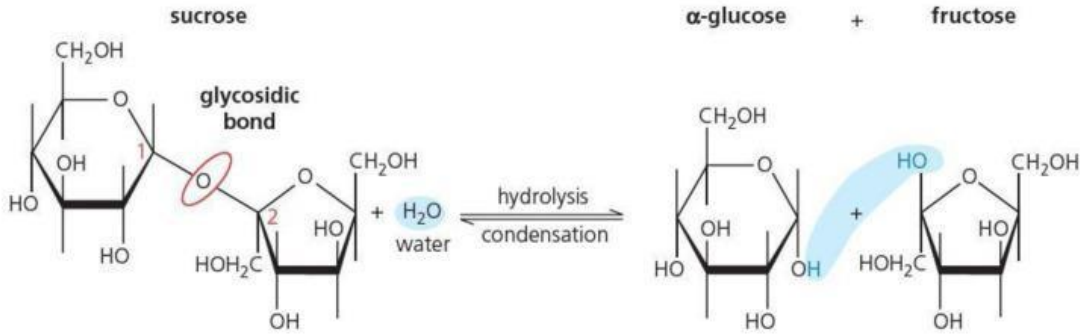
Carbohydrates

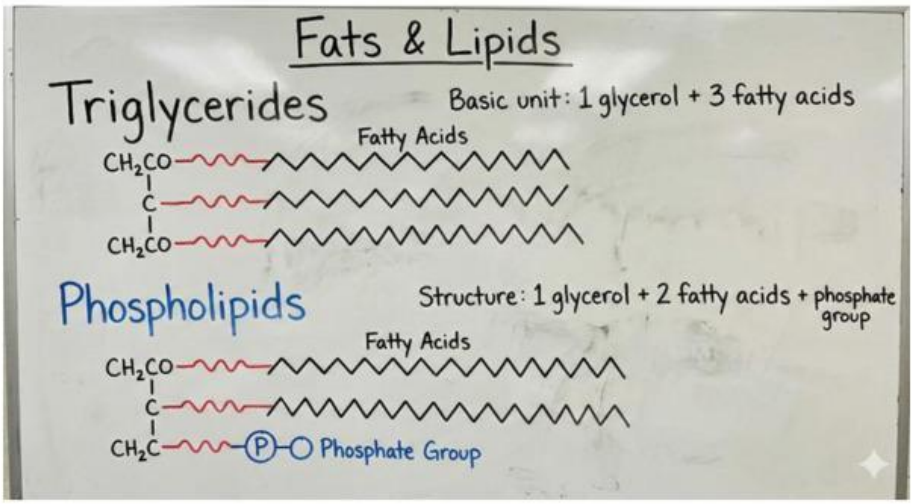
Q	ANS
Give examples of a monosaccharide.	Glucose, fructose, galactose 葡萄糖
Give examples of a disaccharide.	Sucrose (glucose + fructose), maltose（glucose+ glucose）, lactose (glucose+ galactose)
Give examples of a polysaccharide.	Starch, cellulose, glycogen

	Glycogen in liver, muscle = 
Name 3 polysaccharides, where each is found and their function	? Starch - plants - store of glucose. ? Cellulose - plants - make cell walls. ? Glycogen - animals - store of glucose
How is the structure of **glycogen** related to its function?	Coiled & compact - good for storage. Insoluble - Doesn't affect osmosis.
How is the structure of **starch** related to its function?	Coiled & compact - good for storage. Insoluble - Doesn't affect osmosis.
How is the structure of cellulose related to its function?	Long, unbranched chains held together with many bonds =  strong and rigid cell wall.







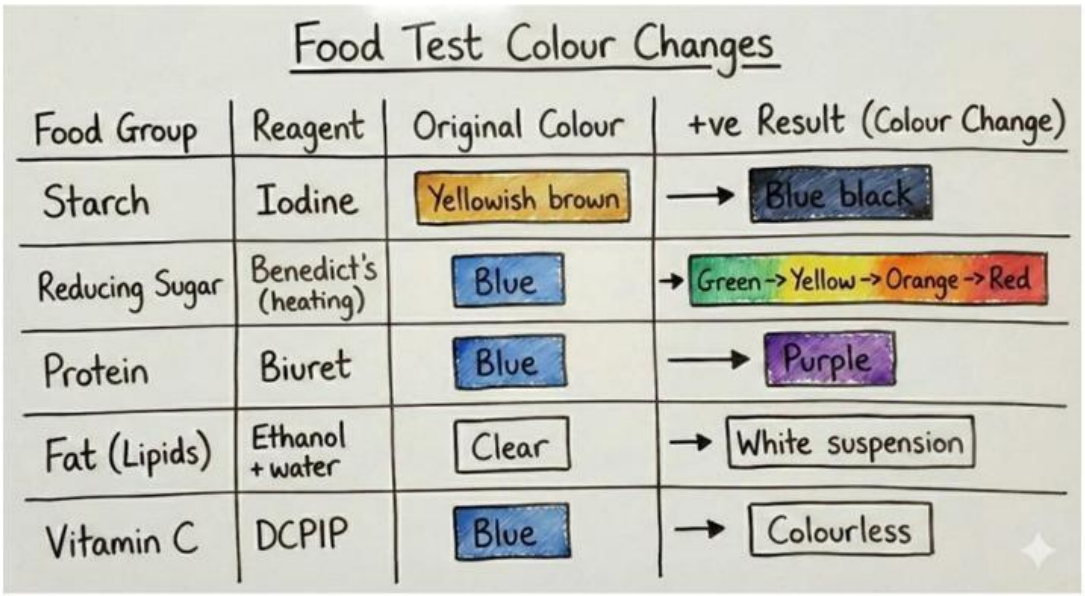


Building Blocks & Elements (基本构成与元素)

Chemical Tests (化学测试)

Question: Describe the chemical test for starch and state the negative and positive result.	Iodine solution. Positive: turn blue black. Negative: stay brown.

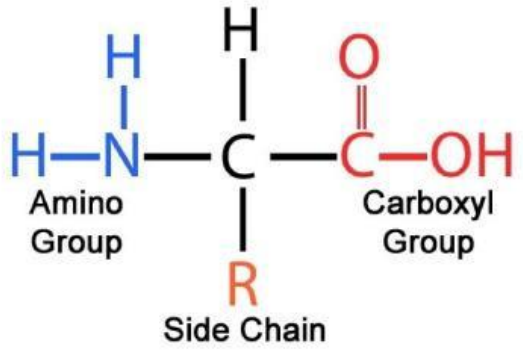
	
Describe the chemical test for glucose (reducing sugars) and state the negative and positive result.	Benedict's solution AND Heat to 70°C. Positive: turn green, yellow, orange, red, brick red (increasing levels of sugar). Negative: stay blue.
Describe the chemical test for fats and state the negative and positive result.	Emulsion test: add ethanol and water and shake. Positive: turn cloudy/milky white. Negative: stay same
Describe the chemical test for vitamin C and state the negative and positive result	DCPIP solution. Positive: turn clear. Negative: stay same (blue).

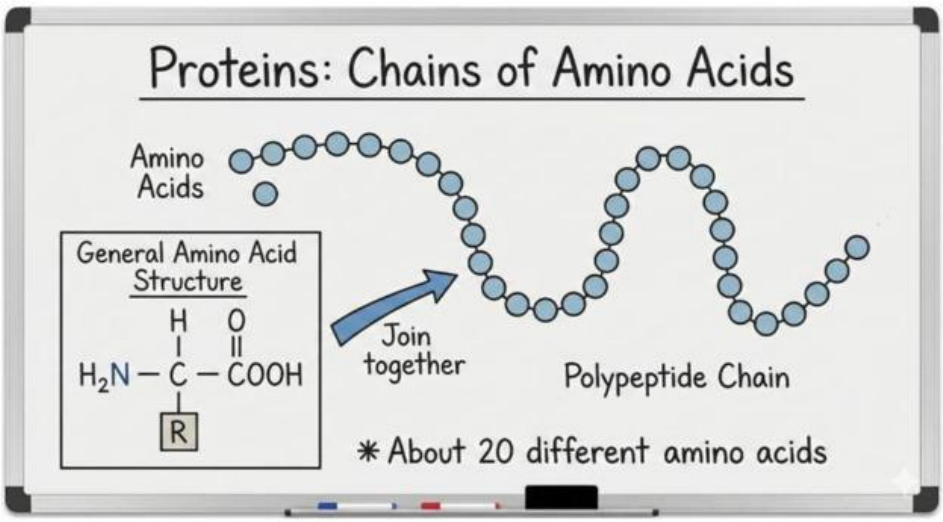


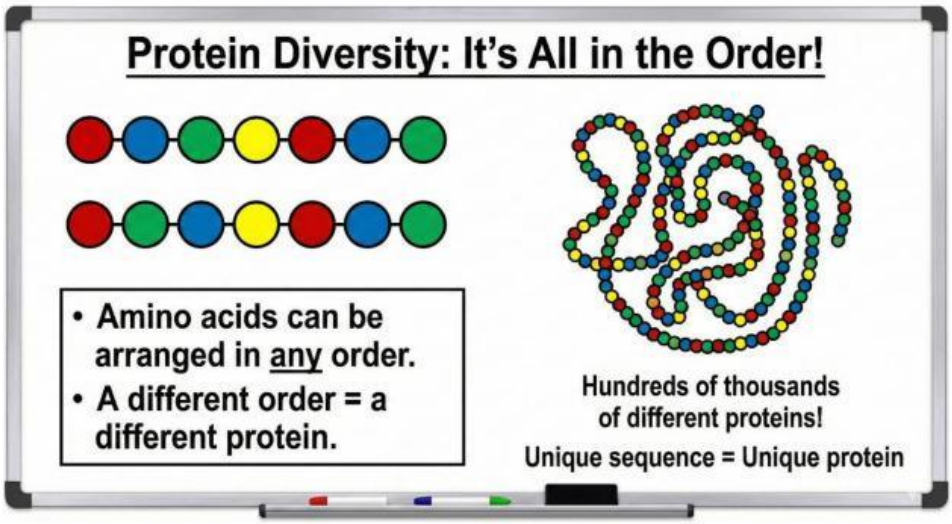
Proteins 🧬

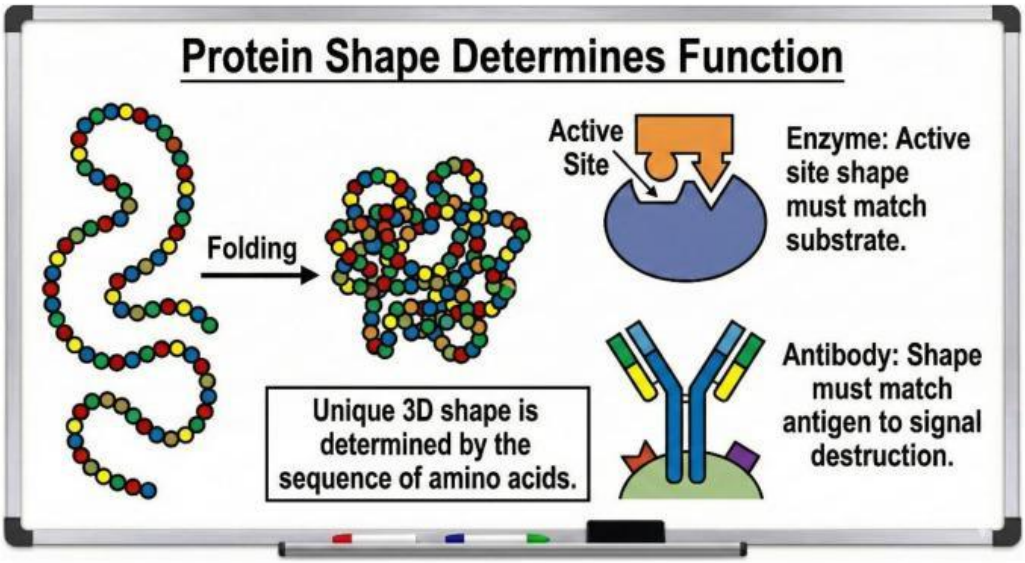
State the elements found in proteins.	Carbon (C), Hydrogen (H), Oxygen (O), **Nitrogen (N), sometimes sulphur (S).**

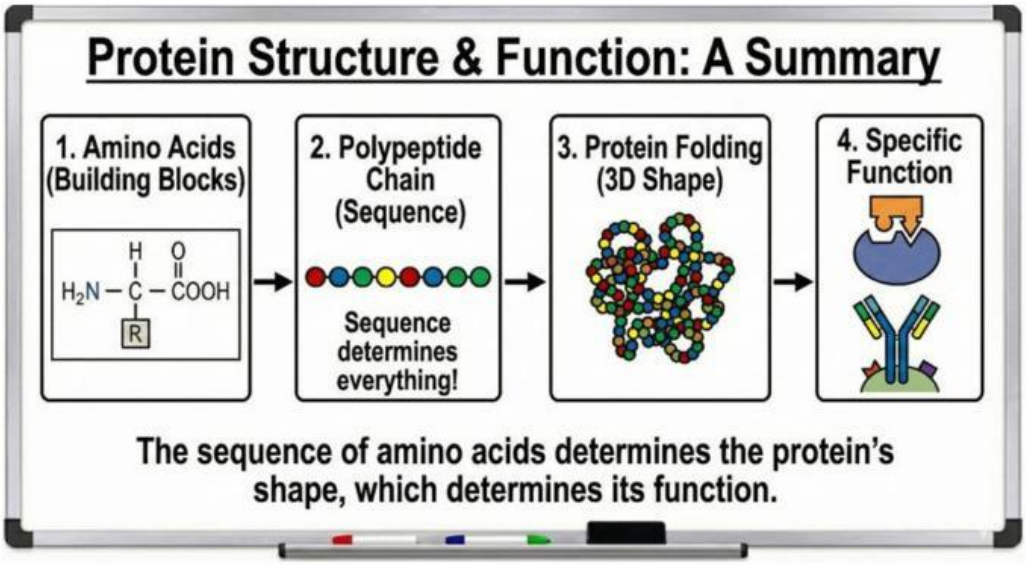
Polypeptide chain will fold to

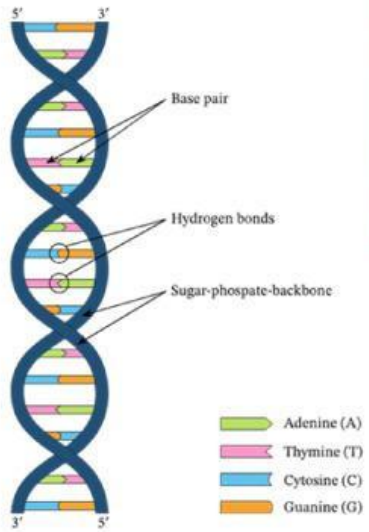
	 Amino acid
Give examples of what is made of **protein.**	**Enzymes, antibodies**, tendons (join bones to bones), **haemoglobin.**

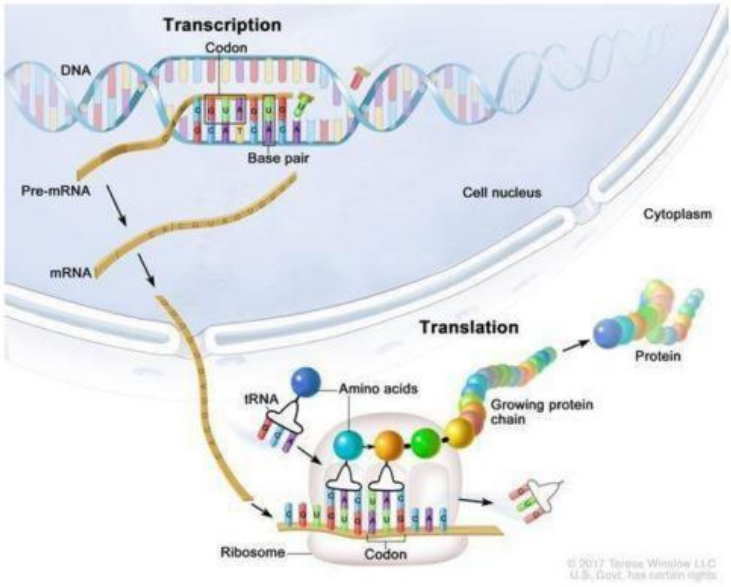






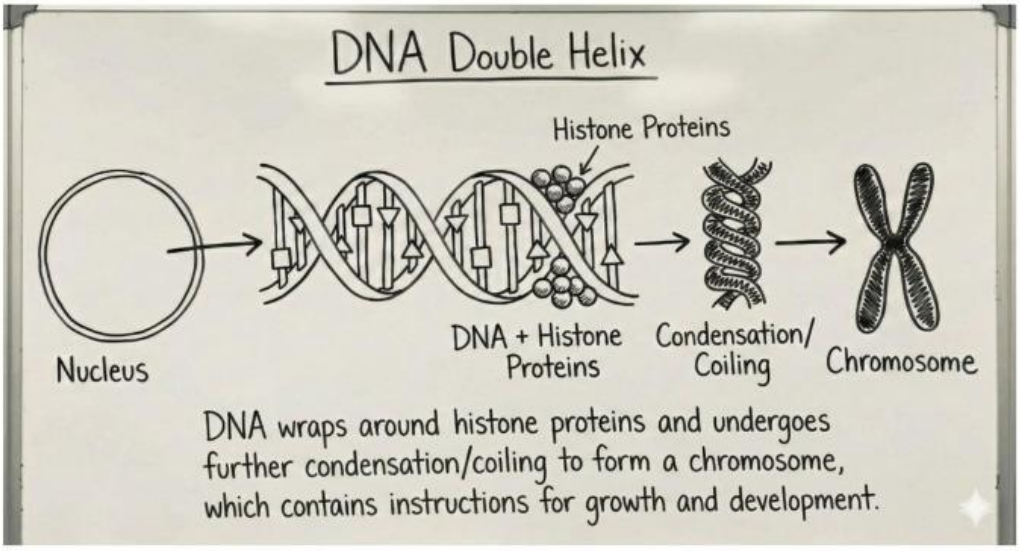




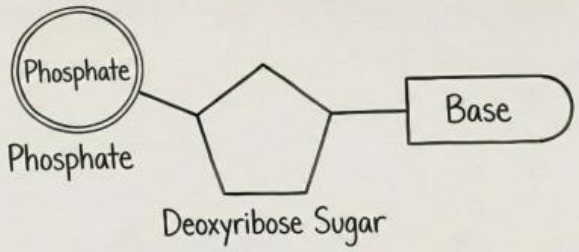


DNA

What does DNA stand for? DNA	Deoxyribose Nucleic Acid DNA=polymer Nucleotide= monomer 单位
What is a nucleotide made up of?	deoxyribose **pentose sugar**, phosphate, base.
Describe the **structure of DNA.**	A **double helix** made up of **2 nucleotides** coiled together. The cross links between strands are formed by pairs of bases.
What are the 4 bases in DNA?	A、T、C、G。
Describe **complementary base pairing**	**A binds with T** with **2 hydrogen bonds**, G binds with C with 3 hydrogen bonds
What is the monomer of DNA?	Nucleotides
Chromosomes	DNA combine with histone protein, undergo further condensation/ coil → chromosome
Explain the importance of water.	Acts as a solvent to allow: • **Digestion** - food broken down by digestive enzymes dissolved in water. • **Excretion** - excess waste dissolved in urine. • **Transport** - dissolved substances (solutes) transported in blood plasma.

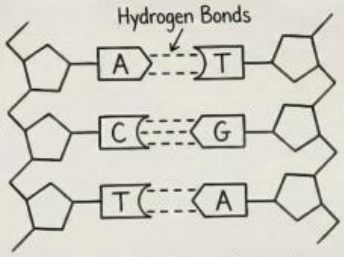


Nucleotide: The Monomer Unit of DNA



4 Different Bases: Adenine (A), Cytosine (C)
Thymine (T), Guanine (G)

Complementary Base Pairing



A always pairs with T, and C always pairs with G, holding the two strands together.

CHAPTER 4 BIOLOGICAL MOLECULES

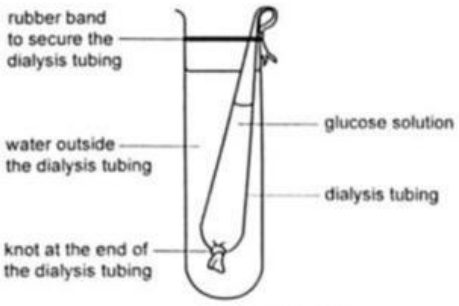


Table 3.1

time / minutes	results of the Benedict's tests on the water outside the dialysis tubing
0	blue
5	green
10	yellow
15	red

Q1. DESCRIBE AND EXPLAIN THE RESULT SHOWN IN Table 3.1 (3m)

Describe

- ✓ Blue at time 0 indicate no glucose present
- ✓ Green, yellow and red indicate that glucose Is present.
- ✓ Green indicate there is low concentration of glucose
- ✓ Red indicate there is high concentration of glucose.

Explain

- ✓ Glucose is small molecules,
- ✓ Glucose can diffuse out of the dialysis tubing into the water
- ✓ From a region of high concentration to low concentration
- ✓ Dialysis tubing is permeable to glucose