Your notes

GCSE Biology: revision notes

Biological molecules and food tests

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Start here: what living things are made of

- Carbohydrates, proteins and lipids (fats and oils) are the large molecules that make up living things and provide energy.
- Each one is made of smaller units joined together. Enzymes break them back down during digestion.

Carbohydrates

- Carbohydrates contain carbon, hydrogen and oxygen.
- Simple sugars such as glucose are the basic units. Many glucose molecules join together to make starch (in plants) and **glycogen** (in animals).

Proteins and lipids

- Proteins contain carbon, hydrogen, oxygen and nitrogen. They are long chains of **amino acids** folded into a particular shape. Enzymes, antibodies and many hormones are proteins.
- Lipids contain carbon, hydrogen and oxygen. A lipid molecule is made of **glycerol** joined to three fatty acids. Lipids store energy and insulate the body.

Food tests

- Starch: add **iodine solution**. It turns from orange-brown to blue-black if starch is present.

- Glucose (a reducing sugar): add **Benedict's solution** and heat in a water bath. The blue colour changes to green, yellow or brick red if glucose is present; the more sugar, the further along that list it goes.
- Protein: add **biuret solution**. It turns from blue to purple if protein is present.
- Lipids: shake the food with ethanol, then pour the liquid into water. A cloudy white emulsion shows a lipid is present.

Water

- Water is a solvent: many substances dissolve in it. That lets blood and sap carry nutrients, wastes and hormones, and lets reactions happen in cells.

Exam tip

- Learn the reagent, what you do and the colour change for each food test. Benedict's is the only test that needs heating.

Common mistakes

- Saying iodine turns "blue" with starch: say blue-black.
- Forgetting to heat **Benedict's solution**.
- Saying proteins are made of glucose. They are made of **amino acids**.

Key terms

Amino acid	The small unit that proteins are made from.
Glycerol	With three fatty acids, it makes up a lipid molecule.
Benedict's solution	A blue reagent that turns green, yellow or brick red when heated with a reducing sugar such as glucose.
Biuret solution	A blue reagent that turns purple when protein is present.
Iodine solution	An orange-brown reagent that turns blue-black when starch is present.
Glycogen	The carbohydrate store in animals and fungi, made of many glucose molecules.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. Which reagent is used to test for starch?
2. What colour does iodine solution turn if starch is present?
3. Which food test needs heating in a water bath?
4. What are proteins made from?
5. What is a lipid molecule made from?

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6. What colour does biuret solution turn when protein is present?
7. Which element is found in proteins but not in carbohydrates?
8. Which carbohydrate do animals store?

Answers

1. Iodine solution
2. Blue-black
3. Benedict's test for glucose
4. Amino acids
5. Glycerol and three fatty acids
6. Purple
7. Nitrogen
8. Glycogen

What to do next

Practise 10 questions on this topic

Try 3 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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