Your notes

GCSE Biology: revision notes

The variety of living organisms

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Start here: what makes something alive

- All living organisms carry out seven life processes: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition (MRS GREN).
- Organisms are sorted into groups by the features they share. The main groups are plants, animals, fungi, **protoctists** and bacteria. Viruses are a special case.

Plants and animals

- Plants are multicellular. Their cells have chloroplasts, so they photosynthesise, and their cell walls are made of cellulose. They store carbohydrate as starch or sucrose. Examples: maize, peas and beans.
- Animals are multicellular. Their cells have no chloroplasts and no cell wall. Most have a nervous system and can move from place to place. They store carbohydrate as glycogen. Examples: mammals such as humans, and insects such as the housefly and mosquito.

Fungi

- Fungi cannot photosynthesise. Most are made of thread-like **hyphae**, which form a network called a **mycelium**. Yeast is a single-celled fungus.
- Their cell walls are made of **chitin**. They feed by **saprotrophic nutrition**: they secrete digestive enzymes onto food outside the body and absorb the soluble products.
- They store carbohydrate as glycogen. Examples: Mucor and yeast.

Protoctists

- **Protoctists** are microscopic and usually single-celled, with a nucleus. Some have chloroplasts and are like plants (Chlorella); others are like animals (Amoeba, which lives in pond water).
- Some **protoctists** are **pathogens**, such as Plasmodium, which causes malaria.

Bacteria and viruses

- Bacteria are single-celled and microscopic. They have no nucleus: their DNA is a single circular chromosome, and many have extra small rings of DNA called **plasmids**. They have a cell wall, a cell membrane and cytoplasm.
- A few bacteria photosynthesise, but most feed off other organisms. Examples: Lactobacillus bulgaricus, used to make yoghurt, and Streptococcus pneumoniae, which causes pneumonia.
- Viruses are much smaller than bacteria and are not made of cells: just a protein coat around DNA or RNA. They can only reproduce inside living cells, so they are all parasites. Examples: tobacco mosaic virus, the influenza virus and HIV.

Exam tip

- Learn one example of each group and one feature that only that group has: **chitin** (fungi), cellulose and chloroplasts (plants), no nucleus (bacteria), a protein coat and no cells (viruses).

Common mistakes

- Saying viruses are bacteria. Viruses are not cells and can't reproduce on their own.
- Saying fungi are plants. Fungi can't photosynthesise and have **chitin**, not cellulose, in their cell walls.

Key terms

Pathogen	A microorganism that causes disease, such as a bacterium, virus, fungus or protoctist.
Hyphae	The thread-like structures that make up the body of most fungi.
Mycelium	The network of hyphae that forms the body of a fungus.
Saprotrophic nutrition	Feeding by secreting enzymes onto food outside the body and absorbing the soluble products.
Plasmid	A small ring of DNA in a bacterium, separate from its main chromosome.
Protoctist	A microscopic, usually single-celled organism with a nucleus, such as Amoeba or Chlorella.

Your notes

Chitin	The substance that makes up the cell walls of fungi.

Quick questions

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

1. Which group of organisms has cell walls made of chitin?
2. What do plants store carbohydrate as?
3. Which of these is not made of cells?
4. What is a mycelium?
5. How do fungi feed?
6. Which protoctist causes malaria?
7. Where is the genetic material of a bacterium?
8. Which organism is used to make yoghurt?

Answers

1. Fungi
2. Starch
3. Influenza virus
4. A network of fungal hyphae
5. By secreting enzymes onto food and absorbing the products
6. Plasmodium
7. In a circular chromosome and plasmids
8. Lactobacillus bulgaricus

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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