

1.2 Variety of Living Organisms

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1. KEY VOCABULARY

TERM	MEANING
Eukaryotic	Cells that have a nucleus (plants, animals, fungi, protoctists).
Prokaryotic	Cells with no nucleus — DNA is a loose circular loop (bacteria).
Multicellular	Made of many cells.
Unicellular	Made of a single cell.
Pathogen	A microorganism that causes disease.
Saprotroph	An organism that feeds on dead or decaying material.

2. THE GROUPS OF LIVING ORGANISMS

<p>PLANTS</p> <p>Multicellular Chloroplasts, photosynthesise Cellulose cell walls Store starch / sucrose e.g. maize, peas</p>	<p>ANIMALS</p> <p>Multicellular No chloroplasts / cell wall Nervous control, move Store glycogen e.g. mammals, insects</p>	<p>FUNGI</p> <p>Often multicellular (hyphae) Cannot photosynthesise Chitin cell walls Feed by saprotrophic nutrition e.g. Mucor, yeast</p>
<p>PROTOCTISTS</p> <p>Microscopic, single-celled Some plant-like, some animal-like e.g. Amoeba, Chlorella, Plasmodium (malaria)</p>	<p>BACTERIA</p> <p>Microscopic, single-celled No nucleus — circular DNA + plasmids Some photosynthesise e.g. Lactobacillus, E. coli</p>	<p>VIRUSES</p> <p>Not cells — protein coat around genetic material Only reproduce inside a host cell (parasitic) e.g. tobacco mosaic, influenza</p>

Prokaryotic = bacteria (no nucleus). Eukaryotic = plants, animals, fungi, protoctists (have a nucleus).

3. PLANTS & ANIMALS

Plants: multicellular; cells have chloroplasts and photosynthesis; cellulose cell walls; store carbohydrate as starch or sucrose. e.g. cereals (maize), legumes (peas).

Animals: multicellular; no chloroplasts or cell walls; usually have nervous coordination and can move; store carbohydrate as glycogen. e.g. mammals, insects.

4. FUNGI & PROTOCTISTS

Fungi: cannot photosynthesise; body is usually a network of threads (hyphae); cell walls made of chitin; feed by saprotrophic nutrition. e.g. Mucor, yeast (single-celled).

Protoctists: microscopic, single-celled; some are plant-like (Chlorella), some animal-like (Amoeba); some are pathogens (Plasmodium causes malaria).

5. BACTERIA, VIRUSES & PATHOGENS

Bacteria: microscopic, single-celled; no nucleus — circular DNA plus plasmids; some photosynthesise. e.g. Lactobacillus (yoghurt), Pneumococcus.

Viruses: not cells; genetic material in a protein coat; only reproduce inside a host cell. e.g. tobacco mosaic virus, influenza, HIV.

Pathogens can be fungi, protoctists, bacteria or viruses.

6. THE WHY

Why bacteria are prokaryotic: they have no nucleus — their DNA floats free in the cytoplasm as a circular loop, with extra small rings called plasmids.

Why viruses are not classed as living: they are not made of cells and cannot carry out life processes on their own — they can only reproduce by hijacking a host cell.

7. COMMON EXAM MISTAKES

- ✗ "Fungi photosynthesise like plants."
- ✓ Fungi cannot photosynthesise — they feed saprotrophically.
- ✗ "Bacteria have a nucleus."
- ✓ Bacteria are prokaryotic — no nucleus, just circular DNA + plasmids.
- ✗ "A virus is a type of bacterium."
- ✓ Viruses are not cells and not bacteria — a separate category.

8. SELF-CHECK · cover & quiz

Can you...

1. Define eukaryotic and prokaryotic?
2. Give the key features of plants and animals, with examples?
3. Give the key features of fungi and protoctists, with examples?
4. Describe the structure of a bacterium and of a virus?
5. Explain why viruses are not classed as living organisms?
6. Give one example of a pathogen from each relevant group?