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IGCSE BIOLOGY

Unit 1

The Nature & variety of Living
Organisms

Contents:

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A: Characteristics of living organisms

Students will be assessed on their ability to:

1.1 recall that living organisms share the following basic characteristics:

- they require nutrition
- they respire
- they excrete their waste
- they respond to their surroundings
- they move
- they control their internal conditions
- they reproduce
- they grow and develop.

M	Movement	All living things move, even plants
R	Respiration	Getting energy from food
S	Sensitivity	Detecting changes in the surroundings
G	Growth	All living things grow
R	Reproduction	Making more living things of the same type
E	Excretion	Getting rid of waste
N	Nutrition	Taking in and using food

B: Variety Of Living Organisms

Students will be assessed on their ability to:

1.2 describe the common features shared by organisms within the following main groups, plants, animals, fungi, bacteria, protoctists and viruses, and for each group describe examples and their features as follows (details of life cycle and economic importance are **not** required).

1.3 Recall the term 'pathogen' and know that pathogens may be fungi, bacteria, protoctists or viruses.

Plants: These are multicellular organisms; they contain chloroplasts and are able to carry out photosynthesis; they have cellulose cell walls; they store carbohydrates as starch or sucrose.

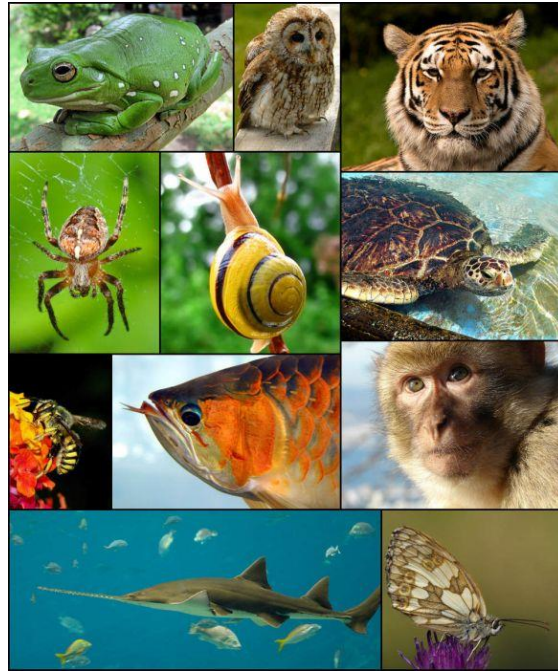
Examples include flowering plants, such as a cereal (for example maize) and a herbaceous legume (for example peas or beans).



Animals: These are multicellular organisms; they do not contain chloroplasts and are not able to carry out photosynthesis; they have no cell walls; they usually have nervous coordination and are able to move from one place to another; they often store carbohydrate as glycogen.

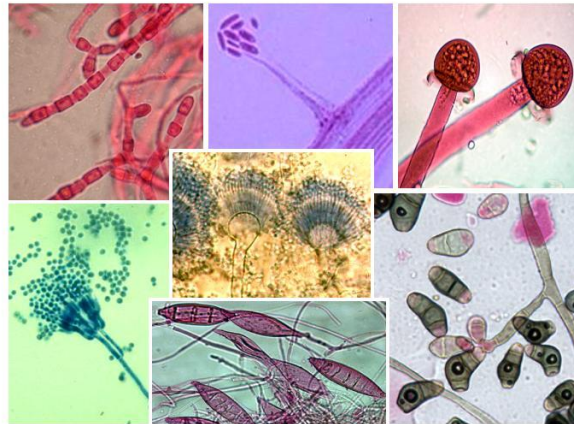
Examples include mammals (for example humans) and insects (for example housefly and mosquito).

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Fungi: These are organisms that are not able to carry out photosynthesis; their body is usually organised into a mycelium made from thread-like structures called hyphae, which contain many nuclei; some examples are single-celled; they have cell walls made of chitin; they feed by extracellular secretion of digestive enzymes onto food material and absorption of the organic products; this is known as saprotrophic nutrition; they may store carbohydrate as glycogen.

Examples include *Mucor*, which has the typical fungal hyphal structure, and yeast which is single-celled.



Bacteria: These are microscopic single-celled organisms; they have a cell wall, cell membrane, cytoplasm and plasmids; they lack a nucleus but contain a circular chromosome of DNA; some bacteria can carry out photosynthesis but most feed off other living or dead organisms.

Examples include *Lactobacillus bulgaricus*, a rod-shaped bacterium used in the production of yoghurt from milk, and *Pneumococcus*, a spherical bacterium that acts as the pathogen causing pneumonia.

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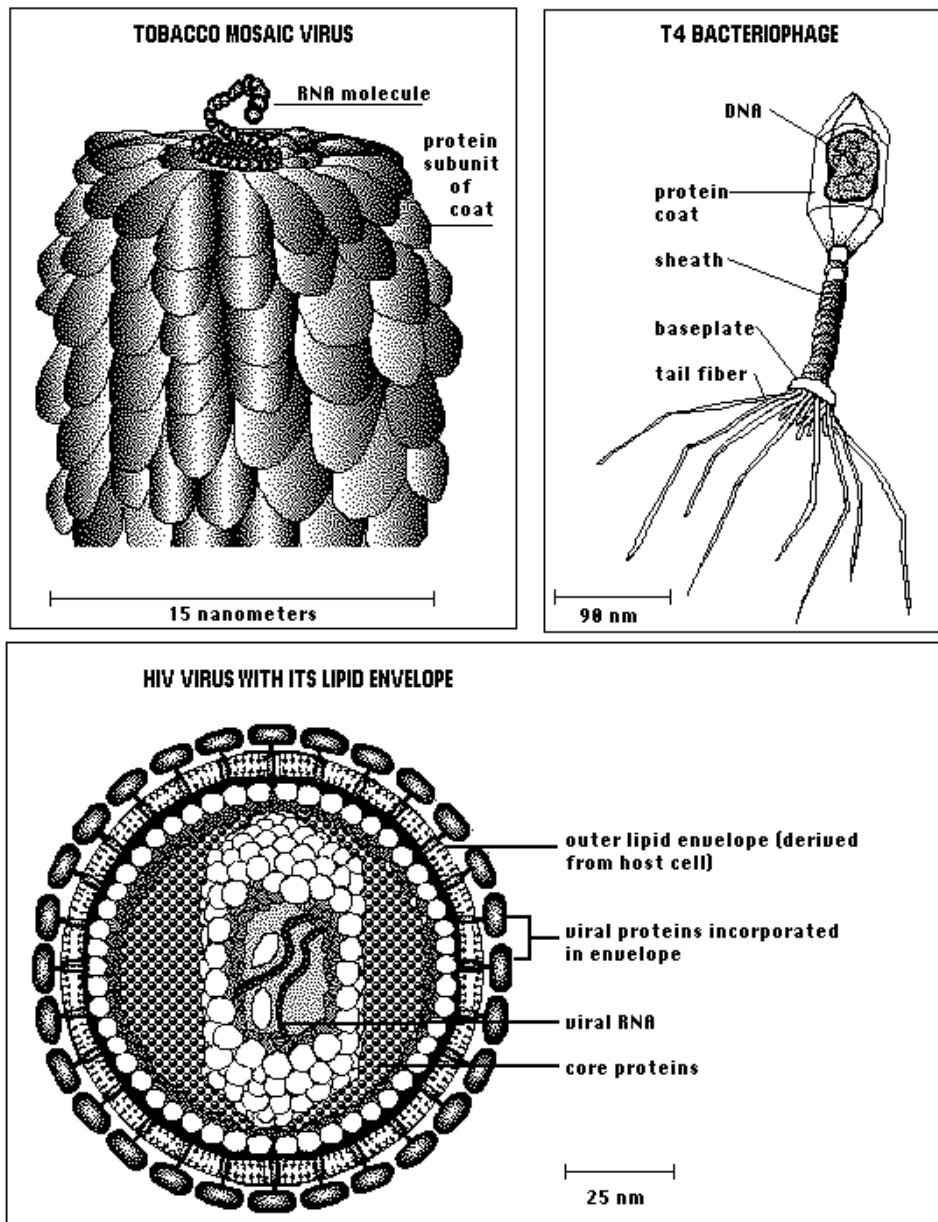


Protoctists: These are microscopic single-celled organisms. Some, like *Amoeba*, that live in pond water, have features like an animal cell, while others, like *Chlorella*, have chloroplasts and are more like plants. A pathogenic example is *Plasmodium*, responsible for causing malaria.



Viruses: These are small particles, smaller than bacteria; they are parasitic and can reproduce only inside living cells; they infect every type of living organism. They have a wide variety of shapes and sizes; they have no cellular structure but have a protein coat and contain one type of nucleic acid, either DNA or RNA. Examples include the tobacco mosaic virus that causes discolouring of the leaves of tobacco plants by preventing the formation of chloroplasts, the influenza virus that causes 'flu' and the HIV virus that causes AIDS.

EXAMPLES OF VIRUSES



Pathogens

Pathogens are disease causing microorganisms (Bacteria, viruses and fungi).

They cause disease and symptoms by;

- 1 Physically damaging the body cells & tissues
- 2 Release toxins as waste which destroys cells and tissues