1.1 Characteristics of life and the five groups

Name: _____ Class: _____ Date: _____ **Total: 24 marks**

KEY WORDS nutrition • respiration • saprotrophic nutrition • glycogen

Objective

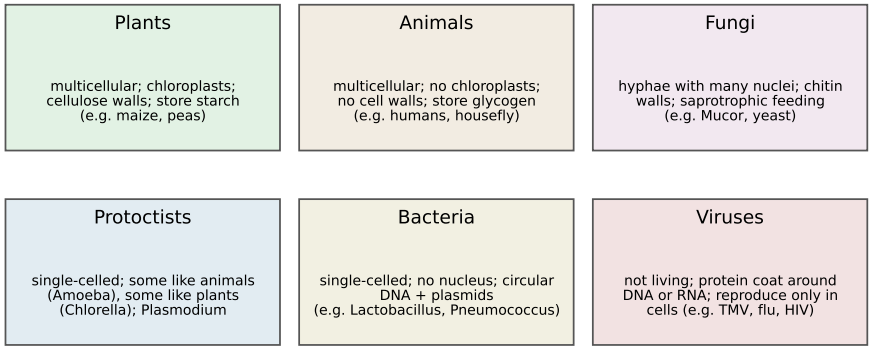
Recall and use the characteristics of life (1.1) and recognise the five groups of living organisms with one named example each (1.2–1.3). Original IGCSE-level practice grounded in specification 4BI1 Section 1.

1 Key knowledge and worked examples

Eight shared characteristics

Nutrition, respiration, excretion, response, movement, control of internal conditions, reproduction, growth. A quick check: name any process a virus cannot do alone – all eight.

The groups at a glance



Group	Cell wall	Nucleus	Chloroplasts	Stores	Example
Plant	cellulose	yes	yes	starch/sucrose	maize, peas
Animal	none	yes	no	glycogen	human, housefly
Fungus	chitin	many nuclei	no	glycogen	Mucor, yeast
Protoctist	(varies)	yes	some	–	Amoeba, Chlorella
Bacterium	yes	no (circular DNA)	some	–	Lactobacillus, Pneumococcus

2 Practice

2.1 List four characteristics shared by all living organisms. [4]

2.2 State two differences between a plant cell and an animal cell, using cell structures only. [2]

2.3 Name the storage carbohydrate in (a) plants, (b) animals, (c) fungi. [3]

2.4 Give one named example of each: a fungus with hyphae, a single-celled fungus, a rod-shaped bacterium, a spherical pathogenic bacterium. [4]

3 Exam-style questions

3.1 Compare fungi and plants in three ways, one of which must be about nutrition. [3]

3.2 *Chlorella* and *Amoeba* are both protoctists. Describe how they differ from each other, and explain why both are classed as protoctists rather than one as a plant and one as an animal. [4]

3.3 *Mucor* grows on bread. Describe how it feeds, and name this type of nutrition. [4]

Solutions

Original-task marking: B1 reasoning point per mark unless shown.

2.1 Any four of: nutrition, respiration, excretion, response to surroundings, movement, control of internal conditions, reproduction, growth.

2.2 Plants have chloroplasts and a cellulose cell wall; animal cells have neither.

2.3 (a) starch (or sucrose); (b) glycogen; (c) glycogen.

2.4 *Mucor* (hyphae); yeast (single-celled); *Lactobacillus bulgaricus* (rod, yoghurt); *Pneumococcus* (spherical, pneumonia).

3.1 Nutrition: fungi cannot photosynthesise and feed saprotrophically, plants photosynthesise. Walls: chitin in fungi, cellulose in plants. Body: hyphae with many nuclei vs multicellular tissues with one nucleus per cell. (Storage is the same – glycogen – so it is not a difference.)

3.2 Chlorella has chloroplasts and photosynthesises like a plant; Amoeba has no chloroplasts and is like an animal cell. Both are classed as protoctists because both are microscopic single-celled organisms – the protoctist group holds single-celled organisms whether animal-like or plant-like.

3.3 *Mucor* secretes digestive enzymes onto the bread from its hyphae; the enzymes digest the bread outside the fungus (extracellular digestion); the soluble products are absorbed. This is saprotrophic nutrition.