

Chapter 1 – The Science of Life

1.1 What is Biology?

Biology: science of life

study of living things & theories that describe world of life

Organism: a living thing

1.2 Characteristics of Life

All living organisms share characteristics of life

Characteristic	Definition	Living thing
1. Cells		Cells carry out activities necessary for organism to stay alive
2. Respiration	Breakdown of food substances to release energy in cells	Gain energy Oxidation of food substances to release energy for cell activities Organic food substances (carbohydrates & fats) used to store energy Energy is set free when substances are broken down through respiration into carbon dioxide and water Equation glucose + oxygen \longrightarrow carbon dioxide + water + large amount of energy
3. Excretion	Removal of metabolic waste products formed inside living cells	Metabolism: sum of all biochemical reactions that take place within cell Metabolic reactions produce waste substances (useless / harmful) Must be removed Excretion: process by which organism removes metabolic waste products Excretory products: substances to be removed carbon dioxide water mineral salts nitrogenous waste Special organs for removing excretory products Lungs Leaves Living organisms: open systems that continually receive & dispose both energy and materials
4. Nutrition	Intake of food into body and its conversion into new protoplasm	Need materials to make protoplasm in cells Nutrition: process by which organisms take in food & convert it into new protoplasm Organisms gain energy & raw materials needed from food Difference between plants & animals: how carry out nutrition

5. Growth & development	Permanent increase in size with changes in form and structure	permanent increase in mass and volume of organism when absorbed food is converted into protoplasm organism made more complex / change its form New matter formed is used to repair worn-out parts of cells Rest is added to original living mater, increases size
6. Reproduction	Production of new individuals for the survival of species	Some characteristics passed on from parents to offspring Necessary for species to survive Species: group of similar organisms
7. Adaptability	Ability of organism to change so as to improve its chances of survival	Any characteristic of organism that improves its chances of surviving in its environment Adjust and adapt to changes in environment
8. Movement	Ability to move body parts and/or exhibit locomotion	Independent of external forces (wind, water currents) Locomotion: animals able to move from one place to another Plants can't carry out locomotion (parts move slowly)
9. Sensitivity / irritability	Ability to detect and respond to changes in environment	Change in environment / external influence causes organisms to react in a predictable way Stimulus: change / external influence Response: reaction of organism to stimulus Response of living organisms to a stimulus

1.3 Classifying Living Organisms

Natural (biological) system of classification – classified according hierarchy

Binomial system of naming species

- Naming (italicised)
 1. First name: genus (uppercase)
 2. Second name: species (lowercase)
- Example: domestic cat

First name – genus	Second name – species
<i>Felis</i>	<i>domestica</i>

