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Theme: Diversity Living Things

Chapter 1 - Introduction to Biology

(If giving notes the underlined words or phrases can be left as blank spaces to be filled student as they write the notes)

Definition

Biology is the study of living things.

Characteristics or life processes of living things

1. **Nutrition:** living things feed; from food living things obtain energy and raw materials to build their bodies.
2. **Respiration:** this is the breakdown of complex organic material into simpler substances to obtain energy
3. **Excretion:** this is the removal of waste metabolic products from the body which would otherwise be poisonous to the body.
4. **Reproduction:** living things reproduce young ones of their likeness.
5. **Growth:** living things grow by assimilation of material
6. **Irritability:** living things have ability to respond to stimulus from internal or external environment.
7. **Movement.** Animals move to look for food, run away from predators and to look for food.

Note that a living thing possesses all these 7 life processes; for instance, a car consumes petrol, burns petrol to obtain energy, excretes carbon dioxide, moves but it is not a living thing because it does not grow or reproduce.

Examples of living things include:



Toad



Tree

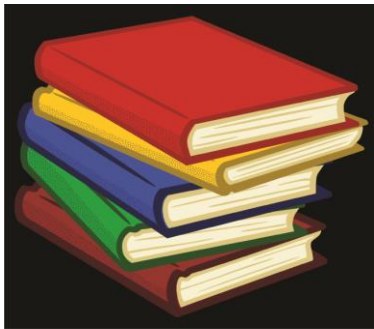


Grasshopper

Trial 1

Draw any other five living things around the school and your home.

Examples of nonliving things include



Books



House



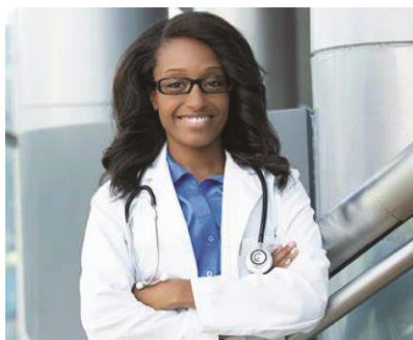
Car

Trial 2

Draw other five non-living things in your school.

Uses of biology in our daily life:

1. **Medicine & Healthcare:** Biology helps us understand diseases, develop treatments, and improve health.



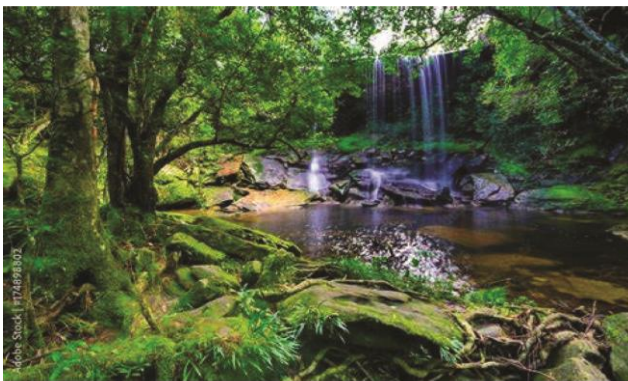
Doctor

2. **Food & Nutrition:** The study of biology guides food production, nutrition, and safety. It helps farmers grow better crops, ensures food is safe, and explains how nutrients affect our bodies.



Balanced diet

3. **Environmental Conservation:** Biology helps protect ecosystems, preserve endangered species, and fight climate change. Knowledge of biodiversity allows us to make informed decisions about conservation.



Tropical forest

4. **Personal Hygiene & Disease Prevention:** Understanding germs and microorganisms helps us practice good hygiene, reduce infections, and prevent the spread of diseases.



Personal hygiene

5. **Animal Husbandry & Agriculture:** Biology helps in breeding livestock, improving crop yield, and ensuring sustainable farming practices.



Animal farm

Trial 3

Identify any other five jobs that one can obtain after studying biology.

Branches of biology

Biology is a vast field with many branches, each focusing on different aspects of living organisms. Here are some major branches:

- **Botany** – The study of plants, their structure, function, and role in ecosystems.
- **Zoology** – The study of animals, their behavior, physiology, and classification.
- **Microbiology** – The study of microscopic organisms like bacteria, viruses, fungi, and protozoa.
- **Genetics** – The study of heredity, genes, and DNA.
- **Ecology** – The study of how organisms interact with their environment.
- **Anatomy & Physiology** – Anatomy focuses on the structure of organisms, while physiology studies how their systems function.
- **Biochemistry** – The study of the chemical processes that occur within living organisms.
- **Molecular Biology** – The study of biological molecules, including DNA, RNA, and proteins.
- **Evolutionary Biology** – The study of how organisms evolve over time.
- **Biotechnology** – The application of biology to technology, including genetic engineering, medicine, and agriculture.

Materials which living organism to maintain their life processes

Living organisms obtain materials from the environment to maintain their life processes while depositing waste matter into the environment. Thus living things and environments are interdependent.

Plants take in various materials from their environment to grow, survive, and carry out essential processes. Some of these materials include:

- **Water**– Absorbed through the roots, water is crucial for photosynthesis, nutrient transport, and maintaining cell structure.
- **Carbon dioxide (CO₂)** – Taken from the air through tiny openings called stomata, CO₂ is used during photosynthesis to produce glucose.
- **Minerals & Nutrients** – Absorbed from the soil through roots, essential nutrients like nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), and magnesium (Mg) help with plant growth, development, and metabolism.
- **Oxygen (O₂)**– While plants release oxygen as a byproduct of photosynthesis, they also absorb oxygen for respiration especially at night.
- **Sunlight**– Plants capture sunlight using chlorophyll in their leaves, converting it into energy through photosynthesis.
- **Organic Matter** - Some plants (such as carnivorous plants) obtain nutrients from decaying organic matter in their environment.

Animals rely on their environment to obtain essential materials needed for survival, growth, and reproduction. Some of these materials include:

- **Oxygen (O₂)** – Most animals take in oxygen from the air (terrestrial animals) or water (aquatic animals) for respiration.
- **Water**– Essential for hydration and various biological processes, animals drink water or absorb it from their food.
- **Food & Nutrients**– Animals obtain proteins, carbohydrates, fats, vitamins, and minerals from plants, other animals, or microorganisms.
- **Shelter & Materials for Nesting**– Animals use materials like leaves, branches, soil, and rocks to build nests, burrows, or shelters.
- **Sunlight & Heat**– Some animals rely on the sun to regulate body temperature, while others use its light to help with vision.
- **Carbon dioxide (CO₂)**– Some organisms, such as aquatic animals, rely on dissolved CO₂ for respiration, and some bacteria use CO₂ in metabolic processes.
- **Minerals & Elements** – Animals absorb essential minerals like calcium (for bones and shells), iron (for blood), and sodium (for nerve function) from food and water.
- **Chemical Signals & Pheromones** – Many animals rely on chemical cues to communicate, find mates, and mark territory.

Trial 4

Match the life process to their functions

Life process	Functions
Feeding	prevents organism from becoming extinct
Movement	releases energy from the body
Sensitivity	removes waste arising from body processes
Respiration	obtains building materials for growth and repair
Reproduction	enables animals to avoid danger in the environment
Excretion	enables animals to obtain food and mates

Differences between plants and animals

Plants and animals are both living organisms, but they have several key differences in structure, function, and how they interact with their environment. Here's a breakdown:

	Plants	Animals
Structural Differences		
Cells	Plant cells have a rigid cell wall made of cellulose	animals cells lack a cell wall
Chlorophyll	Plant cells contain chlorophyll for photosynthesis	Animal cells lack chlorophyll
Growth	Most plants grow continuously throughout their lives	animals have a defined growth period
Functional Differences		
Nutrition	Plants produce their own food using photosynthesis (autotrophic),	Animals rely on consuming other organisms for food (heterotrophic).
Movement	Most plants remain fixed in one place	Animals can move freely to look for food, escape predators or look for mates
Response to Stimuli	Plants respond slowly through growth movements (like bending toward light).	Animals have nervous systems that allow quick responses to stimuli
Reproduction	Plants reproduce through seeds, spores, or vegetative propagation	animals reproduce sexually with specialized reproductive systems.

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Thanks

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