

Learning Outcomes

Year 9 Science — 2022
UNIT 4: PLANTS
From Seed to Feed



CONTENT

Students will learn and be tested on this content.

Students will:

Plant Cells

- Understanding of MRS C GREN as a criteria for living things.
- Understand why plants are living
- Know the basic structure and parts of a plant cell
- Compare and contrast plant and animal cells

Photosynthesis

- Know the word equation for photosynthesis
- Understand where the plant gets the reactants from, and what it does with the products
- Basic understanding of the functions of roots
- Understand that the sun (light) and chlorophyll is required for photosynthesis, and happens in the chloroplast
- Understand the plant undergoes photosynthesis in its leaves, and some different leaf structures
- Basic understanding of the components of a leaf, including stoma, and guard cells
- Understanding that the plant can store glucose as starch

Reproduction

- Understand plants grow flowers to reproduce
- Label and understand the parts of a flower
- Understand that plants have male and female sex organs
- Understand the process of pollination and fertilisation
- Understand the cross and self-pollination
- Identify advantages and disadvantages of cross, self, wind and insect/animal pollination.
- Know how a fruit is formed
- Know different methods of seed dispersal
- Understand the requirements for germination

Learning Outcomes

Year 9 Science — 2022
UNIT 5: ECOLOGY
Equilibrium and Diversity



CONTENT

Students will learn and be tested on this content.

Students will:

Food Webs

- Understanding the difference between consumers, producers, and decomposers
- Understand and construct a simple food chain
- Understand and construct a food web
- Understand the energy transfer for food chains and webs
- Understand how ecology pyramids and trophic levels work
- Speculate on the consequences of the disruption to a food web, either by removing a species, or adding a species

Ecosystem Equilibrium

- Understand the relationship between predator and prey
- Understand adaptations of different species, and how it assists them to survive
- Sustainable activities vs unsustainable activities
- Biodiversity, and the consequences for a lack of biodiversity
- Equilibrium of an ecosystem, and how it might collapse

Nutrient and water Cycle

- Draw and label the water cycle
- Understand the causes and effects of the water cycle
- Understand and follow a nutrient cycle
- Understand the basic premise of the Carbon cycle
- Understand the basic premise of the Nitrogen cycle



CONTENT

Students will learn and be tested on this content.

Students will:

Cell theory

- understand that all living things are built from cells
- have some comprehension about the size of cells, and those cells have structure (organelles) which help them to carry out the processes of life
- understand that cells in multicellular organisms are differentiated, and differentiated cells perform different functions
- an example of differences between cells – differences and similarities between plant cells and animal cells – the main functions of organelles, limited to: cell membrane, cell wall, nucleus, cytoplasm, chloroplasts
- understand that some types of organisms are built from a single cell, for example: bacteria

Disease and disease control (pathogenic diseases)

- understand that infectious diseases can be caused by bacteria, fungi and viruses (the idea that diseases can be caused by other means provides context but is not examinable)
- explain mechanisms of disease transmission
- explain how good personal hygiene, good social hygiene, and good food hygiene can interrupt disease transmission
- describe mechanisms of the human immune system: limited to white blood cells and their roles as killer cells and memory cells, and how antibodies are used to tag cells for destruction
- food preservation (for context, not examinable)

Bacterial diseases

- understand that some bacteria can cause disease
- explain binary fission (identical daughter bacterial cells formed)
- understand the difference between antibiotics, antiseptics and disinfectants.
- be aware of a brief history of antibiotics (how Fleming discovered penicillin, and why this was important).
- describe and explain antibiotic resistance.
- describe and explain steps to take to hinder the development of antibiotic resistance

Viral diseases

- understand that viruses can cause disease.
- explain viral replication (attachment, injection, replication, release).
- be aware of the history of vaccination (how Jenner discovered the smallpox vaccine and why this was important).
- be aware that vaccination is effective against both viral and bacterial diseases.
- link vaccination to mechanisms of the human immune system.
- have some understanding about how vaccinations protect society as well as the individual.