

AUTUMN 1

AUTUMN 2

SPRING 1

SPRING 2

SUMMER 1

SUMMER 2

YEAR 12

Basic concepts of living systems

- Microscopy, magnification and calibration (PAG 1.1 – using a light microscope)
- Eukaryotic and prokaryotic cell structure
- Plant ultrastructure

Biological molecules

- Biological molecules
- Carbohydrates (PAG 5.2 Determining glucose concentration and PAG 9.3 Testing for glucose)
- Structure and type of proteins
- DNA and the genetic code
- ATP

Enzymes

- Factors affecting enzyme action (PAG 4.3 Affect the affect of temperature on amylase)
- Enzyme inhibitors
- Cofactors, coenzymes and prosthetic groups

Plasma membranes

- Structure and function of membranes and factors effecting them
- Diffusion, active transport and osmosis (PAG 8.1 Investigating water potential in a potato)

Cell division

- Cell cycle
- Meiosis and Mitosis
- Cell specialisation and stem cells

Exchange surfaces and breathing

- Specialised exchange surfaces
- Mammalian gas exchange
- Ventilation and gas exchange in other organisms (PAG 12.1 Investigation of respiration in Saccharomyces)

Transport in plants

- Transport in dicotyledonous plants
- Water transport in multicellular plants
- Transpiration and translocation
- Plant adaptations

Classification and evolution

- Classification an evidence of evolution
- Types of variation and adaptations

Transport in animals

- Transport in multicellular animals
- Blood, tissue fluid and lymph
- Oxygen and carbon dioxide transport
- The heart (PAG 2.1 – Dissection of mammalian heart)

Biodiversity

- Sampling and techniques
- Calculating biodiversity (PAG 3.1 Calculating species diversity)
- Factors affecting biodiversity
- Reasons to maintain biodiversity

Communicable diseases

- Animal and plant pathogens and diseases
- Transmission of communicable diseases
- Defences against disease in plants and animals
- Immune system
- Prevention and treating of disease (PAG 7.1 Effects on antibiotics on microbial growth)

YEAR 13

Neuronal communication

- Coordination, neurones and sensory receptors
- Nervous transmission and synapses
- Organisation of the nervous system
- Structure and function of the brain
- Reflexes, voluntary and involuntary muscles
- Sliding filament model

Hormonal communication

- Hormonal communication
- Structure and function of pancreas
- Regulation of blood glucose
- Controlling heart rate

Energy for biological processes

- Energy cycles
- ATP synthesis
- Photosynthesis and factors affecting this (PAG 6.3 TLC of photosynthetic pigments)

Respiration

- Glycolysis, Link reaction and Krebs cycle
- Oxidative phosphorylation
- Respiratory substrates
- Aerobic respiration (PAG 11.1 Exercise and pulse rate)

Homeostasis

- Thermoregulation
- Excretion, homeostasis and liver
- Structure and function of the kidney
- Urine and kidney failure

Plant responses

- Plant hormones and growth
- Plant responses to abiotic stress
- Tropism
- Commercial use of plant hormones

Genetics of living systems

- Mutation and variation
- Control of gene expressions

Patterns of inheritance

- Variation and inheritance
- Dihybrid inheritance
- Phenotypic ratios
- Evolution

Manipulating genomes

- DNA profiling, sequencing and analysis
- Genetic engineering
- Gene technology and ethics

Cloning and biotechnology

- Natural and artificial cloning
- Microorganisms and biotechnology
- Medicines and bioremediation (PAG 10.2 Turbidity)
- Culturing microorganisms
- Using Immobilised enzymes

Ecosystems

- Biomass transfer through ecosystem
- Recycling within ecosystems
- Succession
- Measuring distribution and abundance

Populations and sustainability

- Population size, competition
- Predator-prey relationship
- Conservation, preservation and sustainability
- Ecosystem management- case studies

REVISION