

Ch. 1	<u>The Scientific Method</u>
	The process of the Scientific Method
	The limitations of value of the Scientific Method
	The principles of experimentation
Ch. 2	<u>The Characteristics of Life</u>
	Identify the characteristics of life
	What is metabolism?
Ch.3	<u>Food</u>
	Qualitative Food Tests
	The need for food
	The elements present in food
	Biomolecular structures in food (e.g. protein, carbohydrates, fats)
	Components of food
	Structural role of biomolecules
Exp 1	<i>Food Tests (Starch, Reducing Sugar, fat and protein)</i>
Ch.4	<u>Ecology</u>
	Definitions: Ecology, ecosystem, biosphere, habitat, abiotic/biotic factors
	Energy flow through feeding
	Explanation of a niche
	Carbon and Nitrogen Cycles
	Human impact: Pollution, conservation and waste management
Ch.5	<u>Higher Level Ecology</u>
	Pyramid of Numbers
	Population Control (Competition, Parasitism, predation)
	Population Dynamics
Ch.6	<u>Study of an Ecosystem</u>
	Rocky shore <u>or</u> Woodland
	Flora and Fauna
	Equipment used during the study
	Sources of error
Exp 2	<i>To use keys to identify 5 flora and 5 fauna</i>
Exp 3	<i>To use various pieces of apparatus to collect plants and animals in an ecosystem</i>
Exp 4	<i>To carry out a quantitative study of a habitat</i>
Exp 5	<i>To investigate 3 abiotic factors in an ecosystem</i>
Ch.7	<u>Cell Structure</u>
	Differences between light and electron microscopes
	Components of the cell seen under a light microscope
	Differences between plant and animal cells
	Identify and state the function of organelles in the cell ultrastructure
	Difference between prokaryotic and eukaryotic
Exp 6	<i>To be familiar with a light microscope</i>
Exp 7a	<i>To prepare and examine onion cells using a light microscope</i>

Exp 7b	<i>To prepare and examine cheek cells using a light microscope</i>
Ch.8	<u>Cell Diversity</u>
	Tissue: definition, plant and animal examples
	Main conditions necessary for tissue culture
	Explanation of micropropagation
	Organ: definition, plant and animal examples
	Examples of animal organ systems
	Monoclonal antibodies
Ch.9	<u>Enzymes</u>
	Definition
	Protein nature
	Configuration (shape)
	Role in plants and animals
	Specificity
	Optimum conditions for activity
	Enzyme immobilization and its application in bioprocessing
Exp 8	<i>To investigate the effect of pH on the rate of catalase activity</i>
Exp 9	<i>To investigate the effect of temperature on the rate of catalase activity</i>
Exp 10	<i>To prepare an enzyme immobilization and examine its applications</i>
Ch.10	<u>Enzymes (Advanced Study)</u>
	Active site theory
	Heat Denaturation of protein
	Production and role of ATP
	Role of NADP ⁺ and NAD ⁺ in trapping and transferring electrons and hydrogen ions.
Exp 11	<i>To investigate the effect of heat denaturation on catalase activity</i>
Ch.12	<u>Respiration</u>
	Equation for respiration
	Sequence of reactions for glucose
	Stage 1: glycolysis (Location and description)
	Stage 2: Kreb's cycle and the Electron Transport Chain (Location and description)
	Anaerobic Respiration
	Fermentation (Description and applications)
Exp 13	<i>To prepare and show the production of alcohol by yeast</i>
Ch.13	<u>Diffusion and Osmosis</u>
	Define the terms: Diffusion and Osmosis
	The role of selectively permeable membranes
	Examples of osmosis and diffusion (experiments)
	Explain the terms: plasmolysis, turgor pressure
	The role of osmosis in food preservation
Exp 14	<i>To demonstrate osmosis</i>
Ch.24	<u>Structure of Flowering Plants</u>
	Structure of the flowering plant (Shoot and root components)

	Description of the meristem and location in the shoot and root
	Definition and location of 3 tissue types (Dermal, ground and vascular)
	Identification of monocotyledonous and dicotyledonous plants
Exp 17	<i>To prepare and examine a transverse section of a dicot stem</i>
Ch.25	<u>Transport, Food Storage and Gas Exchange in Flowering Plants</u>
	Uptake of water in the plant and its movement through the plant
	Cohesion-Tension Model (Dixon and Joly)
	Transport of carbon dioxide through the plant
	Production of glucose and transport through phloem
Ch.26	<u>Blood</u>
	State the four main parts in blood and give the function of each part.
	Name the four common blood groups and name the two rhesus blood types.
	Describe the structure of red blood cells in detail.
	Describe the structure of white blood cells.
	Classify white blood cells as Lymphocytes or monocytes.
Ch.27	<u>The Heart and Blood Vessels</u>
	Open and closed circulation
	The structure of the human circulatory system
	Systemic and pulmonary circulation
	Structure of the heart
	The role of valves and muscles in the heart
	Description and example of portal system
	Location of the SA and AV nodes
	The cardiac cycle
Exp 18	<i>To dissect, display and identify parts of a sheep's heart</i>
Exp 19a	<i>To investigate the effect of exercise on pulse rate</i>
Ch.28	<u>The Lymphatic System</u>
	Structure of the lymphatic system
	The functions of the lymphatic system
Ch.29	<u>Human Nutrition</u>
	Omnivore, carnivore and herbivore
	Heterotrophic vs. Autotrophic
	Definition of digestion
	The need for digestion and a digestive system
	The sequence of digestion
	The structure of the digestive system and the associated glands
	Chemical breakdown of food (bile, digestive enzymes)
	The role of symbiotic bacteria
Ch.30	<u>Homeostasis</u>
	Definition of homeostasis
	The purpose of homeostasis

	Osmoregulation
	Temperature regulation
Ch.31	<u>Human Breathing</u>
	Structure of the breathing system
	Function of parts of the breathing system
	Features of alveoli and capillaries for gas exchange
	Mechanism of breathing
	Breathing disorders - asthma or bronchitis
	Carbon dioxide as a controlling factor in the breathing system
Exp 19b	<i>Effect of exercise on rate of breathing</i>
Ch.32	<u>Excretion</u>
	Role of excretory system in homeostasis
	Location, function and products of the excretory system
	Structure of the urinary system
	Role of the kidneys in regulating body fluids
	The nephron's structure and associated blood supply
Ch.36	<u>The Endocrine System</u>
	Definition of hormone
	Comparison between nerve and endocrine response
	Distinction between endocrine and exocrine glands and examples
	Location of endocrine glands in humans and hormones secreted by each
	For one hormone - function, deficiency, excess symptoms and corrective measures