

Biology curriculum guides (2017-2018)

Form 3

INTRODUCTION

Laboratory safety

What is biology?

What are organisms?

Studying biology with the scientific method

Why do we study biology

MOLECULES OF LIFE

Water and inorganic ions

Biomolecules: carbohydrates, lipids, proteins and nucleic acids

CELLULAR ORGANISATION

Discovery of cells

Using a light microscope

The basic structure of a cell

Prokaryotic and eukaryotic cells

Levels of body organisation

MOVEMENT OF SUBSTANCES ACROSS CELL MEMBRANE

Diffusion and osmosis

Osmosis and cells

Osmosis and tissues

Active transport and phagocytosis

FOOD AND HUMAN

Humans as heterotrophs

The food requirements of human

Food tests

Balanced diet

Form 4

MOVEMENT OF SUBSTANCES ACROSS CELL MEMBRANE

Cell membrane: structure, properties and functions

ENZYME AND METABOLISM:

Metabolism

Properties and actions of enzymes

Factors affecting the rate of enzymatic reactions

Applications of enzymes

NUTRITION IN HUMANS:

The processes of human nutrition

The human digestive system

Ingestion of food

Movement of food along the alimentary canal

Digestion of food

Absorption of digested food

Assimilation of absorbed food

Egestion

GASEOUS EXCHANGE IN HUMANS:

The human breathing system

Gas exchange in the air sac

Transport of respiratory gases

Ventilation

TRANSPORT IN HUMANS:

The transport system

The blood

The blood vessels

The heart

Blood circulation

Exchange of materials between blood and body cells

Lymphatic system

NUTRITION & GAS EXCHANGE IN PLANT

Nutrition in plants

Gas exchange in plants

TRANSPIRATION, TRANSPORT & SUPPORT IN PLANTS:

Transpiration

Transport of water, minerals and organic nutrients in flowering plants

Support in plants

CELL CYCLE & DIVISION

Chromosomes

Mitotic cell division

Meiotic cell division

Comparison between mitotic and meiotic cell divisions

REPRODUCTION IN FLOWERING PLANTS

Types of reproduction

Asexual reproduction in flowering plants

Sexual reproduction in flowering plants

Significance of asexual and sexual reproduction

REPRODUCTION IN HUMANS

Human reproductive systems

The menstrual cycle

Fertilization in humans

Development of the embryo and foetus

The birth process

Parental care

Birth control

GROWTH & DEVELOPMENT

Concepts of growth and development

Growth and development in plants

Measurement of growth

Growth curves

DETECTING THE ENVIRONMENT

Irritability

Detecting light by the eye

Detecting light by plants

Detecting sound by the ear

COORDINATION IN HUMAN

The human nervous system

Transmission of nervous impulses

Reflex action and voluntary action

Human endocrine system

MOVEMENT IN HUMAN

The human skeletal system, joints, muscles

Movement of the body

HOMEOSTASIS

The concept of homeostasis

Regulation of blood glucose level

Form 5

BIODIVERSITY

Diversity of life forms

Classification

The six kingdoms and three domains

Classification can change

Biological keys

ECOSYSTEMS

Basic concepts of ecology

Components of an ecosystem

Functioning of an ecosystem

Conservation of ecosystem

PHOTOSYNTHESIS

Basic concepts of photosynthesis

Requirements for photosynthesis

Site of photosynthesis

The process of photosynthesis

The fate of photosynthetic products

Factors affecting the rate of photosynthesis

RESPIRATION

Basic concepts of respiration

Site of respiration

Aerobic respiration

Anaerobic respiration

Relationship between respiration and photosynthesis

PERSONAL HEALTH

Meaning of health and disease

Effect of lifestyles on health

INFECTIOUS DISEASES

Cause of infectious diseases

Ways of transmission and control measures of infectious diseases

NON-INFECTIOUS DISEASES AND DISEASE PREVENTION

Non-infectious diseases

Prevention of diseases

BODY DEFENCE MECHANISMS

Non-specific defence mechanisms

Specific defence mechanisms

BASIC GENETICS

Basic concept of genetics

Genes and heredity

Monohybrid inheritance

Dihybrid inheritance

Inheritance in humans

Variations in characteristics

MOLECULAR GENETICS

From DNA to proteins

Mutations

BIOTECHNOLOGY

Recombinant DNA technology

DNA fingerprinting

Human Genome Project

EVOLUTION I

Appreciate that there are various explanations for the origins of life

Be aware of the limitations of using fossil record as evidence of evolution, and the presence of other evidence

EVOLUTION II

Outline the mechanism of evolution

Relate speciation to evolution

Form 6

HUMAN PHYSIOLOGY: REGULATION AND CONTROL

Regulation of water content

Regulation of body temperature

Regulation of gas content in blood

Hormonal control of reproductive cycle

Biotechnology

Techniques in modern biotechnology

Applications in biotechnology

Bioethics