

Tsuen Wan Public Ho Chuen Yiu Memorial College  
NSS Biology Curriculum (2021-2022)

Form 3

INTRODUCTION

Laboratory safety

What is biology?

What are organisms?

Studying biology with the scientific method

Why do we study biology

FOOD AND HUMAN

Humans as heterotrophs

The food requirements of human

Food tests

Balanced diet

NUTRITION IN HUMANS

The processes of human nutrition

The human digestive system

Ingestion of food

Digestion of food (overview)

## INFECTIOUS DISEASE

Cause of infectious diseases

Ways of transmission and control measures of infectious diseases

## NON-INFECTIOUS DISEASES AND DISEASE PREVENTION

Non-infectious diseases (Cancer and Diabetes)

Prevention of diseases

## BIOTECHNOLOGY

Techniques in modern biotechnology (overview)

Applications in biotechnology (overview)

[This part will be extended in *E4 Biotechnology* of F.6 Biology]

## Form 4

### 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

Cell membrane: structure, properties and functions

Diffusion

Osmosis

Active transport

Phagocytosis

### ENZYME AND METABOLISM

Metabolism

Properties and actions of enzymes

Factors affecting the rate of enzymatic reactions

Applications of enzymes

## NUTRITION IN HUMANS

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 and muscles

Movement of the body

## HOMEOSTASIS

The concept of homeostasis

Regulation of blood glucose level

## Form 5

## BIODIVERSITY

Diversity of life forms

Classification approaches and their changing nature

The six kingdoms and three domains

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

## 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 concepts of genetics

Genes and heredity

Monohybrid inheritance

Dihybrid inheritance (brief introduction)

Inheritance in humans

Variations in characteristics

## MOLECULAR GENETICS

From DNA to proteins

Mutations

## BIOTECHNOLOGY

Recombinant DNA technology

DNA fingerprinting

Human Genome Project

## EVOLUTION I

Appreciating the presence of various explanations for the origin of life

Limitations of using fossil record as evidence of evolution

Acknowledging the presence of other evidence

## EVOLUTION II

Mechanisms of evolution

Speciation and evolution

## Form 6

### E1 - HUMAN PHYSIOLOGY: REGULATION AND CONTROL

Regulation of water content

Regulation of body temperature

Regulation of gas content in blood

Hormonal control of reproductive cycle

### E4 - BIOTECHNOLOGY

Techniques in modern biotechnology

Applications in biotechnology

Bioethics