GCSE Biology Learning Journey

THE WINSFORD ACADEMY

Exams
Combined science x2 1hr 15 minute
Triple x2 1 hr 45 minute

YEAR 11

B7 - Ecology

Farming Techniques
The efficiency of food production
Sustainable Fisheries
Role of biotechnology

Triple - Trophic Levels
Tropic Pyramids
Transfer of Biomass

Global Warming
Deforestation
Climate Change

Waste Management
Pollution in Air, Water & Land

Triple – Impact of Environmental Change
Temperature
Availability of Water
Atmospheric Gases

Triple – Decomposition
Rate of change in decay
Required Practical – Effect of temperate on decay

Materials Cycled
Water / Carbon

Triple – Food Production
Food Security

Maintaining Biology
Breeding Programmes
Protection of Habitats
Recycling

Land Use
Destruction of peat bogs

Biodiversity
Variety of living species in an ecosystem

Adaptations
Organisms have adaptations to enable them to survive
Required Practical – Measuring population

Communities
Levels of Organisation in an Ecosystem
Abiotic & Biotic Factors

Variation & Evolution
The interaction between the gnome and the environment
Anaylse different theories of evolution

Evolution
Triple - Theory of Evolution
Triple – Speciation – Describe the work of Darwin and Wallace

Understanding genetics
Work of Mendal and their discovery

Extinction
Explain different reasons for extinction

Classification of Organisms
Explore the different attempts of classification

Selective Breeding
Best attributes bred together

Genetic Engineering
Replacing Genes
Analyse of GE

Triple – Cloning
Tissue, Cuttings, Embryo Transplant, Adult Cloning

Understanding genetics
Work of Mendal and their discovery

Evidence for Evolution
Anaylse different forms of evidence for evolution
Fossils

Resistant Bacteria
Examples of Resistant forms of bacteria and the danger they possess

Genetic Inheritance
Punnett Squares & calculating probability

Reproduction
Sexual & Asexual Reproduction
Meiosis

Reproduction
Sexual & Asexual Reproduction
Meiosis
Triple – Advantages & Disadvantages of reproduction

Triple
Higher - Uses of plant Hormones

Triple
Plant Hormones
Higher – Specific Hormones & Roles

Genetic Inheritance
Inherited Disorders
Sex determination

DNA & Gnome
Gnome is a single set of genes
Triple – DNA Structure
Triple Higher – Bases of Genes

B6 - Inheritance, Variation & Evolution

Triple
Required Practical – Effects of gravity or light on germination

Triple
Negative Feedback Loops

Endocrine System
Human Reproduction
Menstrual Cycle
HT – Reproductive Hormones

B5 - Homeostasis & Response

Homeostasis
Maintaining the bodies internal conditions

Triple Content
The Structure of the brain
The Structure of the Eye

Triple Content
Controlling body temperature

Homeostasis - Triple
Controlling water & Nitrogen Levels

Triple
Treating infertility with Hormones

Nervous System
Features of the Nerve Cell
The Reflex Arc
Required Practical: The ruler drop

Endocrine System
The Production and movement of hormones

Homeostasis
Controlling Blood Sugar levels

Contraception
Hormonal & Non-Hormonal

Respiration
Aerobic & Anaerobic
Organisms need energy for: chemical reactions to build larger molecules, movement & keeping warm.

Photosynthesis
How to change the rate of photosynthesis.
Light, Temperature & CO2.
HT – Limiting Factor Graphs

B4 - Bioenergetics

Drug Development
Antibiotics & Painkillers
Drug Trials

Vaccinations
Weak or Dead versions of a virus causes antibody production

Respiration
Metabolic Rate – Factors that can affect metabolism

Respiration
Bodies Response to exercise
Heart and breathing rate changes
HT – Blood transports lactic acid to the liver

Photosynthesis
Uses of Glucose from Photosynthesis.
Storage, New Cells, Respiration, Active transport & Growth

Photosynthesis
carbon dioxide + water (Light) → glucose + oxygen

Triple Science
Monoclonal Antibodies Analysis of their uses
Plant Disease & Defence

Pathogens
Protists & Fungai
Protists spread via vectors – Example – Malaria
Fungai Examples – Athletes Foot & Rose Black Spot

Human Defence System
Skin, Nose, Trachea and bronchi, Stomach.

Phagocytosis, Antibody production, Antitoxin production.

The Heart
Anatomy of the heart
Blood Vessels
Contents of Blood
Coronary Heart Disease

Health Issues
Effects of lifestyle on disease

Plant Tissue
Plant Organs – Example – Leaf
Effects of changing temperature
Plant Tissues – Example
Epidermis

B3 – Infection & Response

Pathogens
Bacteria – Too big to enter cells and releases toxins
Examples – Salmonella & Gonorrhea

Human Digestive System
Required Practical – Changing the environment of enzymes

Health Issues
The relationship between health and disease

Health Issues
Cancer – Uncontrollable cell reproduction

Pathogens
Communicable Disease v Non-Communicable Disease

Pathogens
Virus – Enter cells & Reproduce
Examples – Measles & Tobacco Mosaic Virus

Human Digestive System
Required Practical – Food Tests
- Benedicts
- Biurets
- Starch

Transport
Active Transport – Movement against the concentration

Cell Division
Chromosomes
Mitosis & Cell Cycle
Stem Cells

Cell Biology
Animal & Plant Cells: Eukaryotic & Prokaryotic cells
The Structure of different cell
Required Practical - Microscope

Human Digestive System
Enzymes – Location & food Group Absorption

Principles of Organisation
Cells, Tissue, Organ & Organ System

B2 - Organisation

Transport
Diffusion – Movement of gas and solvents
Osmosis – Movement of liquids
Required Practical – Concentrated sugars and Osmosis

Cell Biology
Cell Specialisation & Differentiation
The history of microscopes
TRIPLE – Culturing Bacteria

B1 – Cell Biology

YEAR 10

Welcome