KS5 Physics

Year 12

TERM 1

Foundations of Physics

- Units, scalars and vector

Forces and Motion

- Motion calculations and graphs
- Stopping distances
- Projectile motion
- Calculating gravity

Forces In Action

- Forces
- Mass and weight
- Terminal velocity
- Turning forces
- Density
- Pressure

Work, Energy and Power

- Work done
- Energy and Efficiency
- Power

Materials

- Hooke's law
- Elastic potential energy
- Deforming materials
- Young Modulus

TERM 2

Laws of Motion and Momentum

- Newton's laws
- Momentum and Impulse

Charge and Current

- Current
- Charge
- Kirchoff's 1st law

Energy, Power and Resistance

- Circuits
- Potential difference and electromotive force
- Resistance
- Component characteristics
- Electrical power
- Cost of electricity

Waves 1

- Progressive waves
- Reflection
- Refraction
- Diffraction
- Electromagnetic waves

TERM 3

Electrical Circuits

- Kirchoff's Laws
- Internal Resistance
- Potential Dividers

Quantum Physics

- Photons
- Photoelectric effect
- Wave-particle duality

End of Year Exams

Thermal Physics

- Temperature
- Changing State
- Specific heat Capacity
- Specific latent heat
- Ideal Gases
- Kinetic theory
- Ideal Gas Laws
- Absolute zero

KS5 Physics

Year 13

TERM 1

Gravitational Fields

- Gravitational Fields
- Newton's laws of gravitation
- Kepler's Laws
- Satellites

Stars

- The universe
- Life cycle of stars
- Spectra
- Stellar luminosity

Cosmology and the Big Bang

- Astronomical distances
- Doppler effect and red shift
- Hubble's Law
- Big Bang theory
- Evolution of the universe

Circular Motion

- Angular velocity
- Centripetal force and acceleration

Oscillations

- Simple harmonic motion
- Damping and driving
- Resonance

TERM 2

Capacitance

- Capacitance
- Charging and discharging capacitors
- Electric Fields
- Coulomb's law
- Charged particles in electric fields
- Electric potential and energy
- Magnetic Fields
- Magnetic fields
- Electromagnetic induction
- Faraday and Lenz's laws
- Tranformers

Particle Physics

- Rutherford's experiment
- Nuclear model
- Subatomic particles
- Antiparticles

Radioactivity

- Nulcear decay
- Activity
- Half Life
- Radioactive dating

Nuclear Physics

- E = mc2
- Binding energy
- Nuclear fission and fusion

Medical Imaging

- X-ray imaging
- CAT scans
- Gamma cameras
- PET scanners
- Ultrasound and doppler imaging

TERM 3

Exam Season

KS5 Biology

Year 13

TERM 1

- 5.3 Neural communication
- 5.4 Hormonal communication
- 6.1 Cellular control
- 5.5 Plant and animal responses
- 5.6 Photosynthesis
- 5.7 Respiration
- 6.2 Patterns of inheritance

TERM 2

- 6.5 Ecosystems
- **6.4 Self study module:** Cloning and biotech
- 6.4 Cloning and biotechnology
- 6.3 Manipulating genomes

TERM 3

Exam Season

KS5 Biology

Year 12

TERM 1

- 2.2 Biological Molecules
- 2.3 Nucleic acids
- 2.1 Cell structure
- 2.5 Membranes
- 2.6 cell division, diversity, and differentiation
- 3.1 Exchange surfaces and breathing

TERM 2

- 2.4 Enzymes
- 4.2 Biodiversity
- 3.2 Transport in animals
- 3.3 Transport in plants
- Communicable disease

TERM 3

- 4.3 Classification
- **6.6 self study module:** Populations and sustainability
- 5.1 communication and homeostasis
- 5.2 Excretion as an example of homeostatic control

KS5 Chemistry

Year 13

TERM 1

Module 5

- Rates, equilibrium and pH

Module 6

- Carbonyl Compounds
- Nitrogen compounds, polymers and synthesis

TERM 2

Module 5

- Energy

Module 6

- Analysis

TERM 3

Exam Season

KS5 Chemistry

Year 12

TERM 1

Module 2

- Atoms and Moles
- Formulas and Equations
- Reactions and Calculations
- Electrons, Bonding and Structure

Module 3

- The Periodic Table

TERM 2

Module 3

- Physical Chemistry

Module 4

- Basic Concepts and Hydrocarbons
- Alcohols and Haloalkanes
- Analysis and Organic Synthesis

TERM 3

Module 5

- Transition Metals

Module 6

- Aromatic Compounds

Combined Science

Year 11

TERM 1

B6: Global challenges

- Feeding the human race
- Monitoring and maintaining health
- Non-communicable disease

C5: Monitoring and Controlling Chemical Reactions

- Controlling Reactions
- Equilibria

C6: Global Challenges

- Improving processes and products (Choosing materials - Cracking oil fractions)
- Interpreting and Interacting with Earth Systems

P5: Energy

- Energy stores
- Energy transfer analysis and calculations
- Power, efficiency, cost of electricity
- Insulation

P6: Global Challenges

- Motion:

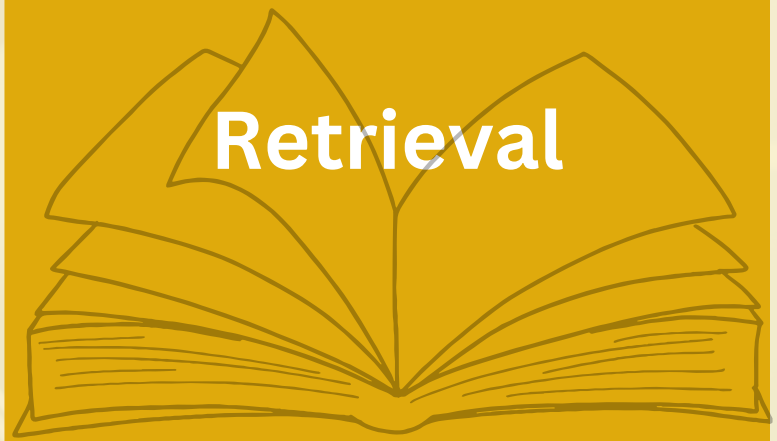
-Stopping distances
-Car safety and collisions

- Mains Electricity:

-Power stations and energy resources
-National grid
-Plugs

TERM 2

Retrieval



TERM 3

Exam Season

Combined Science

Year 10

TERM 1

B2: Scaling up

- **The challenges of size**

B3: Organism-level systems

- **The Nervous System**
- **The Endocrine System**
- **Maintaining internal environments**

C3 – Chemical Reactions

- **Introducing chemical reactions**
- **Energetics**
- **Types of chemical reaction**

P3 – Electricity and Magnetism

- **Electricity:**

-Static electricity
-Current electricity
-Current, potential difference and resistance
-IV Characteristics
-Electrical Power

- **Magnetism:**

-Magnetic fields
-Electromagnetism
-The motor effect

TERM 2

B4: Community level systems

- **Ecosystems**

B5: Genes, inheritance, and selection

- **Inheritance**

C3 – Chemical Reactions

- **Electrolysis**

P4 – Waves and Radiation

- **Waves:**

- Wave types and properties
- Electromagnetic waves
- Reflection, refraction, transmission and absorption

Exam Season

TERM 3

B5: Genes, inheritance, and selection

- **Natural selection and evolution**

B6: Global challenges

- **Monitoring and maintaining the environment**

C4 Predicting and Identifying Reactions and Products

- **Predicting chemical reactions**

Radioactivity

- **Atomic structure, isotopes and ions**
- **Nuclear radiation**
- **Contamination and irradiation**

Combined Science

Year 9

TERM 1

B1: Cell-level systems.

- Cell structure
- What happens in cells?

C1: Particles

- The particle model
- Atomic structure

C2: Elements, Compounds and Mixtures

- Purity and Separating Mixtures

P1 – Matter

- Atomic history
- Temperature
- Heating and cooling
- Gas pressure

TERM 2

B1: Cell-level systems.

- Respiration
- Photosynthesis

C2: Elements, Compounds and Mixtures

- Bonding
- Properties of materials

P2 – Forces

- Speed and acceleration
- Kinetic energy
- Resultant forces
- Newton's Laws
- Terminal Velocity
- Momentum (Higher only)

TERM 3

B2: Scaling up

- Supplying the cell

Retrieval

C2: Elements, Compounds and Mixtures

- Properties of materials

Retrieval

- Work and power
- Gravitational potential energy
- Hooke's Law and elastic potential energy

Retrieval

Exam Season

Separate Science

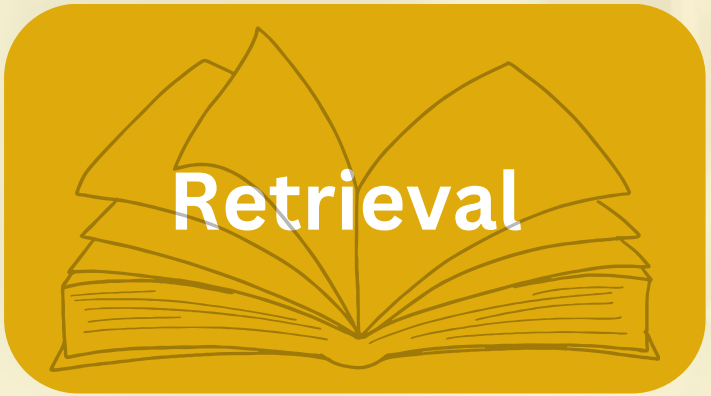
Year 11

TERM 1

B6: Global challenges

- Feeding the human race
- Monitoring and maintaining health
- Non-communicable disease

TERM 2



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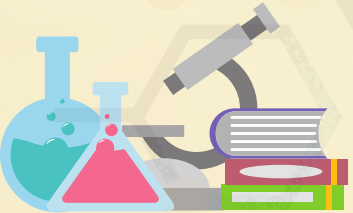


Separate Science

Year 10

TERM 1

B2: Scaling up

- **The challenges of size**

B3: Organism-level systems

- **The Nervous System**
- **The Endocrine System**
- **Maintaining internal environments**

TERM 2

B4: Community level systems

- **Ecosystems**

B5: Genes, inheritance, and selection

- **Inheritance**

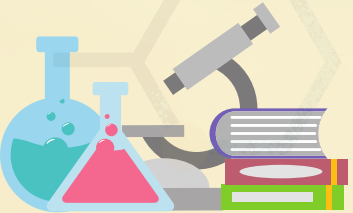
TERM 3

B5: Genes, inheritance, and selection

- **Natural selection and evolution**

B6: Global challenges

- **Monitoring and maintaining the environment**



Separate Science

Year 9

TERM 1

B1: Cell-level systems

- **Cell structure**
- **What happens in cells?**

TERM 2

B1: Cell-level systems.

- **Respiration**
- **Photosynthesis**

TERM 3

B2: Scaling up

- **Supplying the cell**

Retrieval