



OUR LADY & ST JOHN
CATHOLIC COLLEGE

SCIENCE

Year 7	Year 8	Year 9	Year 10	Year 11
<p><u>Autumn</u> <u>Introduction to Science.</u></p> <ul style="list-style-type: none"> • Safety in the lab • Hazard symbols • Using apparatus • Variables • Planning an investigation • Collecting, presenting, and recording data • Analysing patterns in data <p><u>Assessment: Google form</u></p> <p><u>Organisms: Cells</u></p> <ul style="list-style-type: none"> • The microscope- observing cells. • Plant and animal cells • Specialised cells 	<p><u>Autumn</u></p> <p><u>Forces: Contact forces</u></p> <ul style="list-style-type: none"> • Friction and drag. • Squashing and stretching • Turning forces <p><u>Forces: Pressure</u></p> <ul style="list-style-type: none"> • Pressure in gases • Pressure in liquids • Pressure on solids <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p>	<p><u>Autumn</u></p> <p><u>Covid recovery curriculum</u></p> <p><u>Spring</u></p> <p><u>B1 Biology</u> <u>Organisms: Cell Biology</u></p> <ul style="list-style-type: none"> • Microscopy • Animal and plant cell • <u>Required practical-</u> Use a light microscope to observe, draw and label a selection of plant and animal cells. A magnification 	<p><u>Autumn</u></p> <p><u>B2 Biology</u> <u>Genes Homeostasis and response</u></p> <ul style="list-style-type: none"> • Homeostasis • The human nervous system • <u>Required practical-</u> plan and carry out an investigation into the effect of a factor on human reaction time. • Human endocrine system • Control of blood glucose • Hormones in human reproduction • Contraception • Uses of hormones to treat fertility (HT) 	<p><u>Autumn</u></p> <p><u>P2 Physics</u> <u>Forces: Forces</u></p> <ul style="list-style-type: none"> • Scalar and vector quantities • Contact and non-contact forces • Gravity • Resultant forces • Work done and energy transfer. • Forces and elasticity • Distance and displacement • Speed • Velocity • The distance–time relationship

<ul style="list-style-type: none"> • Movement of substances • Unicellular organisms <p>Organisms: Movement</p> <ul style="list-style-type: none"> • Levels of organisation • Body systems • The skeleton • Movement: Joints • Movement: Muscles <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p> <p>Autumn 2</p> <p>Matter: Particles</p> <ul style="list-style-type: none"> • The particle models. • States of matter • Melting and freezing • Boiling • More changes of state • Diffusion • Gas pressure 	<p>Matter: Elements</p> <ul style="list-style-type: none"> • Elements • Atoms • Compounds • Chemical formulae • Polymers <p>Matter: Periodic table.</p> <ul style="list-style-type: none"> • The periodic table • The elements of Group • The elements of Group 7 • The elements of Group 0 <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p> <p>Cumulative assessment</p>	<p>scale must be included.</p> <ul style="list-style-type: none"> • Specialised cells • Mitosis and the cell cycle • Stem cells • Movement of substances- diffusion, osmosis, and active transport. • <u>Required practical-</u> investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue. <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p>	<ul style="list-style-type: none"> • Feedback systems (HT) <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p> <p>Genes: B2 Biology Inheritance, variation, and evolution</p> <ul style="list-style-type: none"> • Sexual and asexual reproduction • Meiosis • DNA and the genome • Genetic inheritance • Genetic disorders • Sex determination • Variation • Evolution • Selective breeding • Genetic engineering • Evolution • Fossils • Extinction • Resistant bacteria • Classification <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p>	<ul style="list-style-type: none"> • Acceleration • Newton's laws of motion • <u>Required practical-</u> investigate the effect of varying the force on the acceleration of an object of constant mass, and the effect of varying the mass of an object on the acceleration produced by a constant force. • Stopping distance • Momentum (HT) <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p>
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<p><u>Matter: Separating mixtures</u></p> <ul style="list-style-type: none"> • Mixtures • Solutions • Solubility • Filtrations • Evaporation and distillation • Chromatography <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p> <p><u>Cumulative assessment</u></p> <p><u>Spring</u></p> <p><u>Genes: Variation</u></p> <ul style="list-style-type: none"> • Variation- genetic and environmental • Continuous and discontinuous • Adapting to change 	<p><u>Spring 1</u></p> <p><u>Organisms- Breathing</u></p> <ul style="list-style-type: none"> • Food tests – starch and sugar • Food tests – fats and protein • Unhealthy diet <p><u>Organisms- Digestion</u></p> <ul style="list-style-type: none"> • The digestive system • The role of the small intestine (H) • The model gut (practical) • Digestive enzymes <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p> <p><u>Spring</u></p>	<p><u>B1 Biology Organisms: Organisation</u></p> <ul style="list-style-type: none"> • Cells, tissues, and organs • The human digestive system • <u>Required practical-</u> Food groups: Benedict's test for sugars; iodine test for starch; and Biuret reagent for protein. • Enzymes (recap) • Enzymes of the digestive system • <u>Required practical-</u> investigate the effect of pH on the rate of reaction of amylase. • Components of the blood • The heart structure and function 	<p><u>B2 Biology Ecosystems: Ecology</u></p> <ul style="list-style-type: none"> • Abiotic and biotic factors • Adaptations • Levels of organisms- sampling techniques (quadrats and transects) • <u>Required practical-</u> measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species. • Carbon cycle • Water cycle • Biodiversity • Waste management • Land use • Deforestation • Maintaining biodiversity <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p>	<p><u>P2 Physics Waves: Waves</u></p> <ul style="list-style-type: none"> • Transverse and longitudinal waves • Properties of waves • <u>Required practical-</u> make observations to identify the suitability of apparatus to measure the frequency, wavelength, and speed of waves in a ripple tank and waves in a solid and take appropriate measurements. • Types of electromagnetic waves • Uses and applications of electromagnetic waves. • Reflection and refraction (HT)
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Genes: Human reproduction

- Adolescence
- Male and female reproductive systems
- Fertilisation and implantation
- Development of the foetus
- The menstrual cycle

Assessment: Baseline, low stakes quizzes and formative EOU assessment.

Forces: Speed

- Introduction to forces
- Balanced and unbalanced forces
- Speed
- Motion graphs

Forces: Gravity

- Forces at a distance

Assessment: Baseline, low stakes quizzes and formative EOU assessment.

Ecosystems – Respiration

- Aerobic respiration
- Anaerobic respiration
- Respiration in yeast

Ecosystem-Photosynthesis

- Photosynthesis
- Structure of the leaf- looking at stomata.
- Limiting factors
- Testing a leaf for starch
- Plant minerals

Assessment: Baseline, low stakes quizzes and formative EOU assessment.

Electromagnets- Magnets and magnetic fields

- Magnets and magnetic fields
- Electromagnets

- The circulatory system
- Coronary heart disease: a non-communicable disease
- Health issues
- The effect of lifestyle on some non-communicable diseases
- Cancer
- Plant tissue and organs

Assessment: Baseline, low stakes quizzes and formative EOU assessment.

B1 Biology Infection and response

- Infection and response
- Microorganisms and diseases caused by pathogens.

Spring

C2 Chemistry Organic chemistry

- Crude oil, hydrocarbons, and alkanes
- Fractional distillation and petrochemicals
- Properties of hydrocarbons
- Cracking and alkenes

Assessment: Baseline, low stakes quizzes and formative EOU assessment.

C2 Chemistry Chemical analysis

- Pure substances/formulations
- Chromatography
- Required practical- investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate R_f values.
- Identification of common gases;

- Required practical- investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.

Assessment: Baseline, low stakes quizzes and formative EOU assessment.

P2 Physics Electromagnets: Magnetism and Electromagnetism

- Poles of a magnet
- Magnetic fields
- Electromagnets
- The motor effect (HT)
- Fleming's left-hand rule (HT only)

<p><u>Energy: Energy transfer</u></p> <ul style="list-style-type: none"> • Food and fuels • Energy resources • Energy and power <p><u>Energy: Energy costs</u></p> <ul style="list-style-type: none"> • Energy adds up. • Dissipation and efficiency <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p> <p><u>Summer</u></p> <p><u>Reactions: Metals and non-metals</u></p> <ul style="list-style-type: none"> • Elements • Chemical reactions • Metals and non-metals • Metals and acids • Metals and oxygen • Metals and water • Metal displacement <p><u>Reactions: Acids and alkalis</u></p> <ul style="list-style-type: none"> • Acids and Alkalis 	<ul style="list-style-type: none"> • Uses of electromagnets. <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p> <p><u>Cumulative assessment Summer</u></p> <p><u>Genes: Evolution</u></p> <ul style="list-style-type: none"> • Natural selection • Charles Darwin • The fossil records. • Extinction • Biodiversity • Preserving biodiversity <p><u>Genes: Inheritance</u></p> <ul style="list-style-type: none"> • Inheritance • DNA • Genetic and punnet squares • Genetic modification <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p>	<ul style="list-style-type: none"> • The body's first line of defence • The role of the white blood cells • Immunity • Vaccines • Antibiotics and painkillers • Discovery and development of new drugs <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p> <p><u>Summer</u></p> <p><u>B1 Biology Ecosystem: Bioenergetics</u></p> <ul style="list-style-type: none"> • Photosynthesis • Rate of photosynthesis • Uses of glucose from photosynthesis. • Aerobic respiration • Anaerobic respiration 	<p>chlorine, oxygen, carbon dioxide and hydrogen.</p> <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p> <p><u>C2 Chemistry Chemistry of the atmosphere</u></p> <ul style="list-style-type: none"> • The proportions of different gases in the atmosphere • The Earth's early atmosphere • Carbon dioxide and methane as greenhouse gases • Human activities which contribute to an increase in greenhouse gases in the atmosphere • Global climate change • The carbon footprint and its reduction • Common atmospheric pollutants and their sources 	<p>Electric motors (HT only)</p> <p><u>Spring 1</u></p> <ul style="list-style-type: none"> • <i>Revision-GCSE B1/ C1/P1 Trilogy</i> <p><u>Spring 2</u></p> <ul style="list-style-type: none"> • <i>Revision-GCSE B2/ C2/P2 Trilogy</i> <p><u>Summer 1</u></p> <p><u>Examinations</u></p> <ul style="list-style-type: none"> • GCSE Biology B1/B2 Trilogy exam • GCSE Chemistry C1/C2 Trilogy exam • GCSE Physics P1/P2 Trilogy exam
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- Indicators and pH
- Acid strength
- Neutralisation
- Making salts

Assessment: Baseline, low stakes quizzes and formative EOU assessment.

Electromagnets: Potential difference and resistance

- Circuit symbols and circuit diagrams
- Series circuits and current
- Series circuits and potential difference
- Resistance
- Resistance of a wire (H)
- Parallel circuits and current
- Parallel circuits and potential difference
- Static electricity

Assessment: Baseline, low stakes quizzes and

Reactions: Types of reaction

- What is a chemical reaction?
- Recap word equations
- Factors affecting chemical reactions.
- Combustion
- Thermal decomposition
- Conservation of mass

Reactions: Chemical energy

- Exothermic and endothermic
- Energy level diagrams
- Bond energies (H)

Assessment: Baseline, low stakes quizzes and formative EOU assessment.

- Response to exercise
- Metabolism

Assessment: Baseline, low stakes quizzes and formative EOU assessment.

Cumulative assessment

Matter: C1 Chemistry Atomic structure and periodic table

- Atoms, elements, and compounds
- Mixtures
- Development of the atom
- Subatomic particles and the atom
- Calculating protons, electrons, and neutrons
- Electronic structure
- The periodic table

Assessment: Baseline, low stakes quizzes and formative EOU assessment.

C2 Chemistry Using resources

- Using the Earth's resources and obtaining potable water
- Required practical- analysis and purification of water samples from different sources, including pH, dissolved solids, and distillation.
- Alternative methods of extracting metals (HT only)
- Life cycle assessment and recycling
- Ways of reducing the use of resources

Summer

P2 Physics Forces: Forces

- Scalar and vector quantities
- Contact and non-contact forces

<p><u>formative EOU assessment.</u></p> <p><u>Ecosystems: Interdependence</u></p> <ul style="list-style-type: none"> • Food chains and webs • Disruption to food chains and webs • Ecosystems • Competition <p><u>Ecosystems: Plant reproduction</u></p> <ul style="list-style-type: none"> • Flowers and pollination • Fertilisation and germination • Seed dispersal <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p>	<p><u>Earth – structure and universe</u></p> <ul style="list-style-type: none"> • The structure of the Earth • The solar system • The Earth • The moon and changing ideas. <p><u>Assessment: Baseline, low stakes quizzes.</u></p>	<ul style="list-style-type: none"> • Development of the periodic table • Metals and non-metals • Group 1 properties • Group 7 properties • Group 0 properties <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p>	<ul style="list-style-type: none"> • Gravity • Resultant forces • Work done and energy transfer. • Forces and elasticity • Distance and displacement • Speed • Velocity • The distance–time relationship • Acceleration • Newton's laws of motion • <u>Required practical-</u> investigate the effect of varying the force on the acceleration of an object of constant mass, and the effect of varying the mass of an object on the acceleration produced by a constant force. • Stopping distance • Momentum (HT) <p><u>Assessment: Baseline, low stakes quizzes and formative EOU assessment.</u></p>	
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P2 Physics
Waves: Waves

- Transverse and longitudinal waves
- Properties of waves
- Required practical- make observations to identify the suitability of apparatus to measure the frequency, wavelength, and speed of waves in a ripple tank and waves in a solid and take appropriate measurements.
- Types of electromagnetic waves
- Uses and applications of electromagnetic waves.
- Reflection and refraction (HT)
- Required practical-: investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.

Assessment: Baseline, low stakes quizzes and formative EOU assessment.

P2 Physics
Electromagnets: Magnetism and Electromagnetism

- Poles of a magnet
- Magnetic fields
- Electromagnets
- The motor effect (HT)
- Fleming's left-hand rule (HT only)

Electric motors (HT only)

Cumulative assessment

Reactions: C2 Chemistry
Rates of reaction

(This topic is switched due to its heavy practical content and being in national lockdown)

- Calculating rates of reaction
- Factors which affect the rates of chemical reactions

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| | | | <ul style="list-style-type: none">• <u>Required practical</u>:- investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity.• Catalysts• Collision theory and activation energy• Energy changes and reversible reactions - Endothermic/ exothermic reactions• The effect of changing conditions on equilibrium (HT only) | |
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Assessment: Baseline, low stakes quizzes and formative EOU assessment.

C1 catch up.

Matter: C1 Chemistry
Atomic structure and
periodic table

- Atoms, elements, and compounds
- Mixtures
- Development of the atom
- Subatomic particles and the atom
- Calculating protons, electrons, and neutrons
- Electronic structure
- The periodic table
- Development of the periodic table
- Metals and non-metals
- Group 1 properties