



'Unlocking powerful knowledge to understand the world around us'

Science is a creative subject which enables students to discover the wonders of the universe for themselves.

Our overall aim is for every student to realise their potential and become life long learners in science irrespective of race, gender, background or ability.

Our Vision:

- To ensure that our students are engaged in their Science education experience through enquiry based learning.
- To develop skills that enable students to understand the world around them and to become informed citizens in Science.
- Develop skills to evaluate and make informed judgements about issues that will affect them at a personal and global level.
- Use their knowledge and skills in applied situations.
- Understand and assess risks involved in everyday life.
- To see Science as relevant to their lives and providing many career opportunities. Link career options to learning science skills/knowledge required for A level/university.
- Create opportunities to contribute to the school and local community.
- Provide opportunities for students to build collaboration and communication skills in Science.
- Support the development of independent study skills, such as how to revise.
- Identify cross-curricular links across the department, for example with the Maths department so we can improve students' confidence to use Maths in Science.
- Celebrate students success when they achieve in their Science education.
- Provide students with the opportunities to extend their Science learning through explicit 'go further' opportunities in Science. This includes providing extra-curricular activities such as in-house visitors and external visits



KS3 Science Curriculum Overview (Year 7 & 8)

At KS3 we follow the national curriculum. KS3 topics have been designed in such a way to allow logical teaching and are separated into biology, chemistry and physics. In KS3, pupils experience how to use standard scientific lab equipment, chemicals and basic practical skills with health and safety. The experiment based teaching foster curiosity and enjoyment in science. Foundation skills at KS3 enables them to step into KS4.

YEAR 7

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|---|--------|---|--------|---|--------|
| TOPIC | <p>Topic Introductory lessons</p> <p>Particles and solutions</p> <p>Forces</p> <p>Cells and Human Body</p> | | <p>Cells and Human Body</p> <p>Acids and Alkalis</p> <p>Energy and Matter</p> | | <p>Variation and classification</p> <p>Light and sound</p> | |
| KEY CONCEPTS | <p>Learn how to safely use lab equipment and how to take measurements</p> <p>States of matter, changing states, diffusion, dissolving, solutions and separating mixtures</p> <p>Forces, squashing and stretching, friction, drag, levers and moments</p> <p>Microscope, plants and animal cells, single celled organisms, specialised cells, cell organelles and their function, organ systems, muscles, skeletal system, digestive system, reproductive system</p> | | <p>Microscope, plants and animal cells, single celled organisms, specialised cells, cell organelles and their function, organ systems, muscles, skeletal system, digestive system, reproductive system</p> <p>Acids and alkalis in the home, indicators and pH, neutralisation and making salts</p> <p>Energies, convection and radiation, Sankey diagrams, renewable and non-renewable energy resources, energy calculations</p> | | <p>Seven life processes, types of variations, adaptations, selective breeding, classification, vertebrates, biodiversity, identifying plants and animals</p> <p>Waves, speed of light, how we see things, reflection, refraction, colours of light, what is sound, speed of sound</p> | |
| ASSESSMENT | <p>Assessment at the end of topic</p> <p>Baseline test at the end of introductory lessons</p> | | <p>Assessment at the end of topic</p> | | <p>End of year Assessment</p> | |



YEAR 8

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|---|--------|--|--------|---|--------|
| TOPIC | Pendulum bridging lessons Electricity & magnetism Energy and ecosystem | | Forces and Motion Health Our Earth | | Elements, Metals and Non Metals Space | |
| KEY CONCEPTS | Pupils use pendulums to recap the scientific method Symbol for electrical equipment, series and parallel circuit, measuring current, potential difference, resistance and power, equations and calculations, unit of measurement, magnets and magnetic force, magnetic fields, making electromagnets Plant reproduction, photosynthesis, function of stomata, aerobic and anaerobic respiration, fermentation, bioaccumulation, fertilisers, fungicides, pesticides, food chains and food webs, pyramids of numbers | | Pressure in fluids, mass and weight, gravity, air resistance, speed and distance/time graphs Balanced diet, food tests, energy in food, consequences of imbalanced diet, respiratory system, how smoking, alcohol, drugs effects health, heart disease and mental health Earth's atmosphere, climate change, global warming, greenhouse effect, types of rocks, sedimentary, metamorphic and igneous, rock cycle | | Periodic table, atoms, elements, compounds and mixtures, metals and non-metals, experiment based investigation Solar system, luminous and non-luminous objects, shadows, how days, months and years occur, seasons, phases of moon, solar and lunar eclipse, satellites and communication, beyond solar system | |
| ASSESSMENT | Assessment at the end of topic | | Assessment at the end of topic | | Assessment at the end of topic End of year Assessment | |

Enrichment Activities

In KS3, we have a science club for Year 7 & 8 pupils to experience application of science hands on activities in a fun way. Pupils are rewarded for their excellent attitude to learning and achievements by sending them to school trips and workshops. Pupils are provided with various opportunities to learn science and its applications outside the book through various in house workshops, outside school trips to labs as well as museums.



KS4 GCSE Trilogy Science Curriculum Overview (Year 9, 10 & 11)

All pupils (except students opting to do Triple Science) follow the AQA Trilogy course. Students have seven lessons of Science, taught in ability groups with two specialist teachers. The programme for study for this is as follows.

The curriculum has been ordered so that pupils can make the maximum progress. As we teach a three year KS3, the fundamentals are at the beginning of Year 9. Due to the way Science is taught, with two teachers with different specialisms, or if there is a different split in lessons, the units may be split over a couple of terms.

YEAR 9

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|---|-------------------------------------|---|-------------------------------------|---|---|
| TOPIC | C1, P3 and B3 | | C2, P1 and B1 | | P2 and B2 | |
| KEY CONCEPTS | <p>C1 – Atomic structure and the periodic table</p> <ul style="list-style-type: none"> A simple model of the atom, symbols, relative atomic mass, electronic charge and isotopes The periodic table <p>P3 – Particle model of matter</p> <ul style="list-style-type: none"> Changes of state and the particle model Internal energy and energy transfers Particle model and Pressures (may run into Term 3) <p>B3 – Infection and response</p> <ul style="list-style-type: none"> Types of diseases Vaccination Drug development | | <p>C2 – Bonding, structure, and the properties of matter</p> <ul style="list-style-type: none"> Chemical bonds, ionic, covalent and metallic How bonding and structure are related to the properties of substances <p>P1 – Energy</p> <ul style="list-style-type: none"> Energy changes in a system, and the ways energy is stored before and after such changes Conservation and dissipation of energy National and global energy resources <p>B1 – Cell Biology</p> <ul style="list-style-type: none"> Cell structure Cell division Transport in cells | | <p>P2 – Electricity</p> <ul style="list-style-type: none"> Current, potential difference and resistance Series and parallel circuits Domestic uses and safety Energy transfers <p>B2 – Organisation</p> <ul style="list-style-type: none"> Animal tissues, organs and organ systems Plant tissues, organs and systems | |
| ASSESSMENT | Exam questions End of topic test | Exam questions End of topic test | Exam questions End of topic test | Exam questions End of topic test | Exam questions End of topic test | Exam questions End of topic test PPE: Paper 1 and Paper 2 |



YEAR 10

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|--|-------------------------------------|--|-------------------------------------|--|-------------------------------------|
| TOPIC | C2, P5, P6, B3 and B4 | | PPEs P6, C3, B4 and B5 | | B5, B7, P6 and C5 | |
| KEY CONCEPTS | <p>B4 – Bioenergetics</p> <ul style="list-style-type: none"> Photosynthesis and Respiration <p>P5 – Forces</p> <ul style="list-style-type: none"> Forces and their interactions <p>P6 – Waves</p> <ul style="list-style-type: none"> Waves in air, fluids and solids Electromagnetic waves <p>C2 – Bonding, structure, and the properties of matter</p> <ul style="list-style-type: none"> Chemical bonds, ionic, covalent and metallic How bonding and structure are related to the properties of substances <p>B3 – Infection and response</p> <ul style="list-style-type: none"> Types of diseases Vaccination Drug development | | <p>P6 – Waves</p> <ul style="list-style-type: none"> Waves in air, fluids and solids Electromagnetic waves <p>C3 – Quantitative Chemistry</p> <ul style="list-style-type: none"> Acid and Alkalis (from AQA Topic 4) Conservation of mass Concentration <p>B4 – Bioenergetics</p> <ul style="list-style-type: none"> Photosynthesis and Respiration <p>B5 – Homeostasis and response</p> <ul style="list-style-type: none"> Homeostasis The human nervous system Hormonal coordination in humans <p>P6 – Waves</p> <ul style="list-style-type: none"> Waves in air, fluids and solids Electromagnetic waves | | <p>B5 – Homeostasis and response</p> <ul style="list-style-type: none"> Homeostasis The human nervous system Hormonal coordination in humans <p>B7 – Ecology Adaptations, interdependence and competition.</p> <ul style="list-style-type: none"> Organisation of an ecosystem Biodiversity and the effect of human interaction on ecosystems <p>P6 – Waves</p> <ul style="list-style-type: none"> Waves in air, fluids and solids Electromagnetic waves <p>C5 – Energy changes</p> <ul style="list-style-type: none"> Exothermic and endothermic reactions | |
| ASSESSMENT | Exam questions End of topic test | Exam questions End of topic test | Exam questions PPE: Paper 1 in each specialist science | Exam questions End of topic test | Exam questions | Exam questions End of topic test |



YEAR 11

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|--|--|--|---|---|--------|
| TOPIC | P4 and C7 | C8, C9 and B6 | P7 and C10 | Revision | Revision | |
| KEY CONCEPTS | <p>P4 – Atomic structure</p> <ul style="list-style-type: none"> • Atoms and isotopes • Atoms and nuclear radiation <p>C7 – Organic chemistry</p> <ul style="list-style-type: none"> • Carbon compounds as fuels and feedstock | <p>C8 – Chemical analysis</p> <ul style="list-style-type: none"> • Purity, formulations and chromatography • Identification of common gases <p>C9 – Chemistry of the atmosphere</p> <ul style="list-style-type: none"> • The composition and evolution of the Earth's atmosphere • Carbon dioxide and methane as greenhouse gases • Common atmospheric pollutants and their sources <p>B6 – Inheritance, variation and evolution</p> <ul style="list-style-type: none"> • Reproduction • Variation and evolution • The development of understanding of genetics and evolution • Classification of living organisms | <p>P7 – Magnetism and electromagnetism</p> <ul style="list-style-type: none"> • Permanent and induced magnetism, magnetic forces and fields • The motor effect <p>C10 – Using resources</p> <ul style="list-style-type: none"> • Using the Earth's resources and obtaining potable water • Life cycle assessment and recycling | | | |
| ASSESSMENT | Exam questions | Exam questions PPE: Paper 1 in each specialist science | Exam questions End of topic test PPE: Paper 1 and 2 in each specialist science | Exam questions Walking talking mocks | Exam questions Walking talking mocks | |



KS4 Biology Curriculum Overview (Year 9, 10 & 11)

GCSE Biology is studied in Years 9, 10 and 11. We follow the AQA Biology specification which is an exciting and interesting course that explores many aspects of the living world around us such as: microbiology, immunity, ecology, genetics, life processes and many more. The course is designed to be engaging as well as provide pupils with knowledge and skills. The knowledge that the students learn are applied in a variety of contexts preparing them for not only higher education but their life in the 21st Century.

YEAR 9

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|--|--------|---|--------|--|---|
| TOPIC | Infection and Response | | Cell Biology | | Animal Organisation | Animal Organisation |
| KEY CONCEPTS | A study of how animals and plants can be attacked by pathogens with a detailed focus on some key diseases. How organisms can defend themselves from this | | An overview of the different types of cells how they reproduce and how they become specialised We also look at how material can enter and leave the cell | | An overview on how organs and organ systems in animals are organised with an in-depth look at the digestive and cardiovascular systems | We then look at "lifestyle" diseases that can affect these systems as well as preventative actions and treatments |
| ASSESSMENT | Exam questions End of topic test | | Exam questions End of topic test | | Exam questions End of topic test | Exam questions End of topic test End of year PPE |



YEAR 10

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|--|---|---|--------|--|--|
| TOPIC | Plant Organisation | Bio-energetics | Homeostasis and Response | | Variation and Evolution | Variation and Evolution |
| KEY CONCEPTS | An overview of how organs and organ systems are organised in plants with particular focus on the leaves, xylem, phloem and roots | An in-depth study on biochemical reactions and what can affect them | We learn how the human body maintains a delicate balance of various factors for optimum function as well as how we detect and respond to the world around us. We also learn how plants control their growth | | We study an overview of evolution – how it happens, what causes it and the evidence that supports it. We then compare and contrast this with selective breeding before then looking at cloning and antibiotic resistance. Finally we look at classifying living things | We study an overview of evolution – how it happens, what causes it and the evidence that supports it. We then compare and contrast this with selective breeding before then looking at cloning and antibiotic resistance. Finally we look at classifying living things |
| ASSESSMENT | Exam questions End of topic test | Exam questions End of topic test | Exam questions End of topic test PPE (Term 3) | | Exam questions End of topic test | Exam questions End of topic test End of year PPE |



YEAR 11

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|---|---|-----------------------|----------------|---|--------|
| TOPIC | Variation and Evolution And Ecology | Ecology | | Revision | Revision | |
| KEY CONCEPTS | <p>We study an overview of evolution – how it happens, what causes it and the evidence that supports it. We then compare and contrast this with selective breeding before then looking at cloning and antibiotic resistance. Finally we look at classifying living things</p> <p>A study of the living world around us</p> <p>How energy and matter is transferred along food webs and the interdependence of living things</p> | <p>We now look at how humans can influence this delicate balance of living things with topics such as environmental destruction, pollution and the effects of farming/fishing</p> <p>Finally we look at how we can avoid and even repair the damage we have caused to the planet and the role that biotechnology can play in this</p> | | | | |
| ASSESSMENT | Exam questions | Exam questions End of topic test PPE | Exam questions PPE | Exam questions | Exam questions Walking talking mocks | |



KS4 Chemistry Curriculum Overview (Year 9, 10 & 11)

YEAR 9

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|---|--------|--|--------|---|--------|
| TOPIC | C1 Atomic Structure The Periodic Table | | C4 Chemical changes | | C6 Rate and extent of chemical reaction | |
| KEY CONCEPTS | History of the atomic model, structure of the atom, sub-atomic particles Electronic configuration Ions and ionic formulae Patterns in the periodic table, groups and periods The alkali metals, halogens and noble gases Reactions of alkali metals and halogens Simple balanced chemical equations | | Acids, alkalis and bases Neutralisation and reactions of acids Further balanced chemical equations Standard solutions and concentration (g/dm^3) The reactivity series Reactions of metals with oxygen, water and acids REDOX (oxidation and reduction) Extracting metals from their ores Electrolysis and ionic equations A_r and M_r and % element in a compound | | Factors affecting the rate of a reaction Collision theory and activation energy Calculating the rate of a reaction Catalysts Reversible reactions and equilibrium Factors affecting equilibrium and Le Chatelier's principle | |
| ASSESSMENT | Assessment at the end of topic | | Assessment at the end of topic Required Practical 8 – 'Making a soluble salt' Required Practical 9 – 'Electrolysis of solutions' | | Assessment at the end of topic Required Practical 11 – 'Investigate how changes in concentration affect the rate of reaction' | |



YEAR 10

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|--|--------|---|--------|---|--------|
| TOPIC | C2 Structure and Bonding | | C3 Quantitative Chemistry | | C5 Energy changes in reactions C7 Organic Chemistry | |
| KEY CONCEPTS | <p>Chemical bonds, ionic, covalent and metallic</p> <p>How substances and structure are related to the properties of substances</p> <p>Structure and bonding of carbon</p> | | <p>Foundation: Consolidation of basics mostly covered in Y9 (conservation of mass, balanced equations, Ar, Mr, % element in a compound and concentration g/dm^3 (moles not needed F) Also general maths skills</p> <p>Higher: as above PLUS mole, reacting masses, limiting reactants, concentration mol/dm^3</p> | | <p>Exothermic and endothermic reactions</p> <p>Reaction profiles</p> <p>Calculating energy change of reactions (HT only)</p> <p>Crude oil, hydrocarbons and alkanes</p> <p>Fractional distillation and petrochemicals</p> <p>Properties of hydrocarbons</p> <p>Cracking and alkenes</p> | |
| ASSESSMENT | Assessment at the end of topic | | Assessment at the end of topic | | <p>Required Practical 10 – ‘Temperature change in reactions’</p> <p>Assessment at the end of topic</p> | |



YEAR 11

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|---|--------|---|--------|--------|--------|
| TOPIC | C8 Chemical Analysis C9 Chemistry of the Atmosphere | | C10 Using Resources | | | |
| KEY CONCEPTS | Purity, formulations and chromatography Identification of common gases Composition and evolution of the Earth's atmosphere Carbon dioxide and methane as greenhouse gases Common atmospheric pollutants and their sources | | Using the Earth's resources and sustainable development Potable water and waste water treatment Alternative methods of extracting metals Life cycle assessment and recycling | | | |
| ASSESSMENT | Required Practical 12 – 'Paper Chromatography' Assessment at the end of topic | | Required Practical 13 – 'Analysis and purification of water' Assessment at the end of topic | | | |

Please note that this is the hoped route, there are likely to be significant changes due to COVID-19 school closures/limitations.

Current Y9 and 10 have NOT followed this route, this is the proposed route for the Y9s starting GCSE in September 2021. Y10 and Y11 will follow the previous route.



KS4 Physics Curriculum Overview (Year 9, 10 & 11)

YEAR 9

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|--|--|---|---|---|---|
| TOPIC | Heat and Energy I | Forces and Motion I | Electricity Generation | Current Electricity | Elastic Materials | Staying Afloat |
| KEY CONCEPTS | Conduction Convection Radiation Insulation Energy Transfer Efficiency | Vectors and Scalars Speed Motion Graphs Newton's Laws Weight and Mass Terminal Velocity | Fossil Fuels Renewable Energy Cost Benefit Analysis | Electric Current Resistance Ohm's Law Non-Ohmic Conductors Thermistors and LDRs | Hooke's Law Elastic Potential Energy | Density Floating and Sinking Upthrust |
| ASSESSMENT | Exam questions End of topic test | Exam questions End of topic test | Exam questions End of topic test | Exam questions End of topic test | Exam questions End of topic test | Exam questions End of topic test PPE |



YEAR 10

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|---|--|---|---|---|--|
| TOPIC | Sound, Light and Seismic Waves | The Electro-magnetic Spectrum | Forces and Motion II | Heat and Energy II | Mains Electricity | Astronomy and Cosmology |
| KEY CONCEPTS | Waves Sound and the Ear Ultrasound and Sonar Earthquakes Reflection and Refraction Colours | Lenses Uses and Dangers of the Electro-magnetic Spectrum Earth's Temperature and Greenhouse Effect | Moments Momentum Vector Diagrams Impulse Stopping Distances | Work Done Gravitational Potential Energy Kinetic Energy Internal Energy Specific Heat Capacity Specific Latent Heat Pressure and Gas Laws | Alternating Current Wiring a Plug Fuses | Life Cycle of a Star Satellites Doppler Effect The Origin of the Universe |
| ASSESSMENT | Exam questions End of topic test | Exam questions End of topic test | Exam questions PPE | Exam questions End of topic test | Exam questions End of topic test | Exam questions End of Year Exam |



YEAR 11

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|---|---|---|--|---|--------|
| TOPIC | Radioactivity | Fields | Electromagnetism | Revision | Revision | |
| KEY CONCEPTS | Theories of the Atom Atomic Radiation Half Life Nuclear Energy and Fission Nuclear Fusion | Magnetic Fields Compasses Electric Fields Static Electricity | Fields around a Conductor Motor Effect Electromagnetic Induction Transformers The National Grid | | | |
| ASSESSMENT | Exam questions | Exam questions End of topic test PPE: Paper 1 and Paper 2 | Exam questions End of topic test | Exam questions PPE: Paper 1 and Paper 2 | Exam questions Walking talking mocks | |



KS5 Biology A level Curriculum Overview (Year 12 & 13)

A level Biology is studied in Years 12 and 13. We follow the AQA specification which looks at a wide range of biological topics. This course provides the gateway to further study of Biology at University or many fields of work where the knowledge and skills developed can be applied in a work setting.

At Little Heath School the course is taught by two members of the Biology team. Half of the content is covered by one member of staff while the other half is taught by the second. The material is taught in parallel.

YEAR 12: Teacher A

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|--|--|--|---|--|---|
| TOPIC | Biological Molecules | Biological Molecules | Organisms Exchange Substances with their Environment | Organisms Exchange Substances with their Environment | Revision | Energy Transfers in and between Organisms |
| KEY CONCEPTS | We take an in-depth review of the structure of a range of molecules such as carbohydrates, lipids and proteins. We then develop this knowledge by looking at their biological importance | We take an in depth view of DNA and the process of it's replication. We also look at the biological importance of water and some selected inorganic ions | An overview on how organisms exchange substances with their environment with a detailed view on the specifics of the digestive and respiratory systems | We undertake a detailed study of the mass transport systems in animals and plants | | We partake of a detailed study into the biochemical processes of photosynthesis and respiration |
| ASSESSMENT | Exam questions Require Practical 1 Term 1 introductory test | Exam questions Required Practical 5 End of unit test | Exam questions | Exam questions End of unit test | Exam questions End of year test (PPE) | Exam questions Required Practical 7 and 8 |



YEAR 12: Teacher B

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|--|--|---|---|--|--|
| TOPIC | Cells | Cells | Genetic Information, Variation and Relationships between Organism | Genetic Information, Variation and Relationships between Organism | Revision | Genetics, Populations, Evolution and Ecosystems |
| KEY CONCEPTS | We undertake a study in the structure and various features of different kinds of cells. We then study how these different types of cells can reproduce | Using the material from term 1 we then look at how material can pass between cells and the roll of the immune system | We look at the structure and role of DNA in living organisms. We then look at how it replicates and is passed on to the next generation. In this process we especially look at how it gives rise to variation and the befits that this brings the species | We study how species are identified and organised. We then look at diversity; why it matters and how it is measured | | We study inheritance in the form of genetic crosses and how this is relevant to a species as a whole |
| ASSESSMENT | Exam questions Required Practical 2 Term 1 introductory test | Exam questions Required Practical 3 and 4 End of unit test | Exam questions Required Practical 6 | Exam questions End of unit test | Exam questions End of year test (PPE) | Exam questions |



YEAR 13: Teacher A

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|--|--|--|--|--|----------------|
| TOPIC | Energy Transfers in and between Organisms | Energy Transfers in and between Organisms | The Control of Gene Expression | The Control of Gene Expression | Revision | Revision |
| KEY CONCEPTS | We study what can affect the rate of photosynthesis and respiration and how this impacts on living organisms | We then look at how nutrients are cycled and the effects that this has not only on living things but also on human process such as farming | We take an in-depth study of how genes are expressed and how this process is controlled. We then look at how this process can go wrong; leading to conditions such as cancer | We then study how the process of gene expression can be used in various gene technologies and the applications that they can be put to | | |
| ASSESSMENT | Exam questions Required Practical 9 Term 7 introductory test | Exam questions End of unit test | Exam questions January PPE | Exam questions End of unit test | Exam questions Walking talking mock | Exam questions |



YEAR 13: Teacher B

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|--|--|---|--|--|----------------|
| TOPIC | Genetics, Populations, Evolution and Ecosystems | Genetics, Populations, Evolution and Ecosystems | Organisms Respond to Changes in their Internal and External Environment | Organisms Respond to Changes in their Internal and External Environment | Revision | Revision |
| KEY CONCEPTS | Using the knowledge from the previous term; we take a detailed study at the process of evolution | Using our knowledge of evolution we look at how it can effect populations of a species | We study how simple organisms can respond to the world around them before taking an in-depth look at nerve transmission and how the heart is controlled | We study how the body's internal environment is maintained and take a detailed view of how specific factors are controlled | | |
| ASSESSMENT | Exam questions Required Practical 10 Term 7 introductory test | Exam questions Required Practical 11 and 12 End of unit test | Exam questions January PPE | Exam questions End of unit test | Exam questions Walking talking mock | Exam questions |



KS5 Chemistry A level Curriculum Overview (Year 12 & 13)

YEAR 12

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|--|--|---|--|--|--|
| TOPIC | Elements of Life (EL) Organic/Physical Inorganic/Physical | Developing Fuels (DF) Elements from the Sea (ES) | Developing Fuels (DF) The Ozone Story (OZ) | What's in a Medicine (WM) | Revision | NMR (¹³ C and ¹ H) PAG12 |
| KEY CONCEPTS | O/P: Atomic structure and M _r , Simple nuclear equations, Spectroscopy and Electronic configuration, Calculations E = hn and c = ln, Covalent bonding; Ions, Metallic bonding P/I: Moles, PAG 1 – using moles, Balancing equations and reacting masses, Periodicity, Groups 1 & 2, Acid/Base reactions, Concentration, standard solutions and titration, PAG 2 – Acid base titration | DF: Enthalpy, PAG 3, bond breaking/making calculations, fractional distillation, cracking, basic polymerisation, Catalysis, Alkanes, Alkenes, Electrophilic Addition, Ideal gas law, Isomerism, Emissions ES: Halogens and reactions, REDOX, half equations and balancing redox equations, Electrolysis, Equilibrium and K _c calculations, Risk/Benefit analysis, redox titrations, Hydrogen Halides, Identifying unknown substances | DF: See Term 2 OZ: Atmosphere and calculations involving gases Electromagnetic spectrum Homolytic/heterolytic fission, radicals Rate Homogeneous catalysis CFCs and intermolecular bonds Haloalkanes and nucleophilic substitution PAG 5b Synthesis of halogenoalkane and use of separating funnel | Drug, medicine, poison Alcohols and ethers, isomerism Reactions of alcohols Carboxylic acids Esterification Synthesis of salicylic acid and aspirin (PAG 6) – Theory before Y12 exams, practical after -OH group in alcohols, phenols and carboxylic acids Infrared spectroscopy Mass spectrometry Jigsaw puzzle of chemical analysis | WM ESQ after revision over holiday OZ ESQ after revision over holiday | PL4 Activities and EQs Recap MS and IR The chemical analysis jigsaw Spectroscopy in a suitcase masterclass How much Mn in a nail Part 1 - follow instructions to get Mn containing solution Part 2 - Research and Plan how to use colorimetry to investigate Part 3 - Focus on % error calculations |
| ASSESSMENT | | | | | PPE Exams H033/01 and H033/02 both 1½ hours | |



YEAR 13

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|--|---|--|--------|----------------|--------|
| TOPIC | Chemical Industry (CI) | Polymers and Life (PL) Oceans (O) | PPE Revision Colour by Design (CD) Developing Metals (DM) | | Revision | |
| KEY CONCEPTS | <p><i>Rate and Order:</i></p> <p>Make sure PAG 9 completed</p> <p>Rate equation</p> <p>Order of reaction</p> <p>Calculations and units</p> <p>PAG 10</p> <p>Synthesis, reacting masses, atom economy and % yield recap</p> <p><i>N₂ cycle, REDOX and Equilibrium:</i></p> <p>Group 5 chemistry</p> <p>N_xO_y gases</p> <p>REDOX of N₂ cycle</p> <p>Equilibrium</p> | <p>PL: Recap alcohol, carboxylic acid, ester chemistry</p> <p>Amines and amides</p> <p>Amino acids and proteins</p> <p>Optical isomerism</p> <p>DNA</p> <p>Enzymes and inhibitor mechanisms</p> <p>Instrumentation</p> <p>O: Acid-Base chemistry</p> <p>Strong/weak acid/alkali and calculations</p> <p>Buffers</p> <p>PAG 11</p> <p>Ksp</p> <p>Atmosphere, climate change and greenhouse effect</p> <p>Entropy</p> | <p>CD: Colour</p> <p>Benzene and aromatic compounds</p> <p>Electrophilic substitution</p> <p>Azo compounds</p> <p>Attaching dyes to fabrics</p> <p>Fats and oils</p> <p>TLC/GLC</p> <p>Aldehydes/Ketones and nucleophilic addition</p> <p>Organic synthesis</p> <p>PAG 7</p> <p>DM: The d-block and transition metals</p> <p>Catalysis</p> <p>Colour</p> <p>Complexed</p> <p>Colorimetry</p> <p>REDOX and equations</p> <p>Electrochemistry</p> <p>PAG 8</p> <p>Rusting and protection</p> | | Exam technique | |
| ASSESSMENT | CI test before half term | O test before Christmas PL test after Christmas | | | Examinations | |



KS5 Physics A level Curriculum Overview (Year 12 & 13)

YEAR 12

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|---|--|---|---|---|--|
| TOPIC | Fundamentals of Physics / Current and Charge | Vectors, Scalars and Forces / Electrical Circuits | Kinematics / Resistance and EMF | Newton's Laws and Energy / Waves | Materials / Quantum Physics | Periodic Motion |
| KEY CONCEPTS | Mathematical Skills Estimating Vectors and Scalars Errors Charge Kirchhoff's First Law Drift Velocity | Vector Diagrams Resolving Moments Density Archimedes Principle Electromotive Force Potential Difference Resistivity Power | Speed Acceleration SUVAT Equations Free Fall Resistors Internal Resistance Potential Dividers | Newton's Laws of Motion Momentum Impulse Conservation of Energy Polarisation Refraction Total Internal Reflection Interference Young's Double Slit Experiment Stationary Waves | Hooke's Law Stress and Strain Young Modulus Photons Photoelectric Effect Wave-Particle Duality Electron Diffraction | Circular Motion Simple Harmonic Motion Resonance |
| ASSESSMENT | Practical Assessment End of topic test | Practical Assessment End of topic test | Practical Assessment End of topic test | Practical Assessment End of topic test | Practical Assessment End of topic test | Practical Assessment End of topic test PPE |



YEAR 13

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|--------------|---|--|--|--|--|--------|
| TOPIC | Thermal Physics / Capacitance | Gas Laws / Electric Fields | Gravitational Fields / Magnetic Fields | Astrophysics / Nuclear Physics | Cosmology / Medical Physics | |
| KEY CONCEPTS | Internal Energy Specific Heat Capacity Specific Latent Heat Capacitors Charging and Discharging Energy in Capacitors | Ideal Gas Law Boltzmann's Law Coulomb's Law Uniform Electric Fields Electric Potential | Newton's Law of Gravitation Gravitational Potential Orbits Magnetic Flux Motion of Charged Particles in a Magnetic Field Electromagnetism | Star Life Cycle Hertzsprung-Russell Diagram Energy Levels and Photon Emission Fundamental Forces Quarks Half Life Equations Fission and Fusion | Origin of Universe Hubble's Law Dark Matter X-Rays Medical Tracers Ultrasound Revision | |
| ASSESSMENT | Practical Assessment End of topic test | Practical Assessment End of topic test | Exam questions End of topic test PPE: Paper 1 and Paper 2 | Practical Assessment End of topic test | Practical Assessment End of topic test PPE: Papers 1, 2 and 3 | |