

**Sir John Talbot's School**

**CURRICULUM**

**#togetherwegrow**

Marches Academy Trust 

# Science

## What is my Learning Journey for Year 7?

We follow the KS3 Activate Scheme of learning.

Marches Academy Trust



Food chains and webs, ecosystems, competition, pollination, fertilisation and germination, seed dispersal.

**Big question: What happens to organisms if ecosystems change?**

### Key Skills:

- Recall and retention of scientific facts
- Using key scientific terminology
- Calculations and equations
- Graph skills
- Analysing and interpreting data
- Evaluating information
- Using models

### Assessments:

- Knowledge checks per topic
- Assessments every double topic
- 6-mark BUG questions per term
- Weekly Educake quizzes
- End of year assessment

### #realworldready

- Consider the impacts of humans on ecosystems and organisms around the world
- Appreciate how understating the menstrual cycle has led to contraception and fertility treatments
- Find out how chemical reactions can be used to make useful, everyday products
- Know what all materials are made up of
- Find out where our energy comes from and how we can be more energy efficient

### Useful websites and support

- KS3 Bitesize
- Oak Academy KS3 science
- Educake (login provided)

### Home Learning

- Weekly Educake quizzes
- Revision for knowledge checks and assessments
- Enrichment projects over term breaks



YEAR 8



## Earth

The structure of Earth, Rock cycles, Solar system, Moon and changing ideas.  
**Big question: How big is the solar system?**

## Ecosystems



Measuring forces, unbalanced & balanced forces, speed & gravity.  
**Big questions: How can we measure speed? Where do forces come from?**

## Forces

Variation, adaptation, puberty, reproductive systems, sexual intercourse, pregnancy and the menstrual cycle.  
**Big question: How are new humans made?**



## Genes

Potential difference and resistance, series and parallel circuits, current and charge.  
**Big question: How can one light in your house go out but the rest stay on?**

Baseline assessment

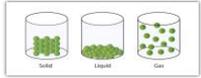


Acids & alkalis & pH, neutralization, making salts, elements, reactions of non-metals & metals with water, acid & oxygen, displacement reactions.  
**Big question: What are chemical reactions?**



## Matter

The particle model, states of matter, changes of state, diffusion, pressure, pure substances & mixtures, solutions and separating techniques.  
**Big question: What are materials like inside?**



## Electromagnets



## Organisms



Skeleton, joints & muscles, cells & microscopes, movement of substances & unicellular organisms  
**Big question: What are we made of?**

## Energy



Different energy resources and fuels, power and energy transfers.  
**Big question: How will we generate electricity in the future?**

## Enquiry processes

Safety in the laboratory  
Equipment in the laboratory  
Enquiry skills



# Science

## What is my Learning Journey for Year 8?

We follow the KS3 Activate Scheme of learning.

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### Key Skills:

- Recall and retention of scientific facts
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- Graph skills
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- Evaluating information
- Using models

### Assessments:

- Knowledge checks per topic
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- Weekly Educake quizzes
- End of year assessment

### #realworldready

- Understand our solar system and what we are planning to do
- Appreciate the changes that have happened for humans to evolve to where we are now and why we are so similar to other family members.
- Find out how we can make changes to save energy and what affect this has for the whole world.
- Predict how chemicals will react.
- Find out what causes friction and how we can improve it.
- Understand what our body needs to function and how our body uses food as fuel.

### Useful websites and support

- KS3 Bitesize
- Oak Academy KS3 science
- Educake (login provided)

### Home Learning

- Weekly Educake quizzes
- Revision for knowledge checks and assessments
- Enrichment projects over term breaks

# Year 9

## Waves Earth

Solar system, natural and artificial satellites

**Big question: How big is the solar system?**

Aerobic and anaerobic respiration, Biotechnology, Photosynthesis, Leaves and plant minerals.

**Big question: How do plants produce food?**

## Ecosystems



Frictions and drag, Turning forces, Pressure in gases and liquids, and stress on solids. **Big questions: Why do you slide so much on ice?**

## Forces

Chemical reactions, combustion, Thermal decomposition, Conservation of mass, Exo and Endothermic, Energy levels and bond energies.

**Big question: What happens in a chemical reaction?**



## Reactions

## Matter

Elements, atoms, compounds, polymers, and the periodic table. **Big question: Can we predict the properties of materials?**

## Genes

Natural selection, Charles Darwin, Extinction, DNA, Genetics.

**Big question: Why do family members look similar?**



## Electromagnets

Magnets and magnetic fields, Electromagnets and their use.

**Big question: How can you make a magnet strong enough to lift a car?**

## Energy

Energy transfer, Energy and temperature, work done and machines, radiation and insulation.

**Big question: How can we save energy?**

## Organisms

Structure of lungs, effect of exercise, smoking, food and food tests, digestive system, diet, and enzymes.

**Big question: How do we get energy from food?**





# Biology Key Stage 4 Overview

What is my Learning Journey for Year 9, 10 and 11?



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**Content** – Reproduction, DNA, inheritance, inherited disorders, variation, evolution, selective breeding, genetic engineering, fossils, extinction & classification

**Bigger Picture Focus** – To understand how we can use genetics to enhance crops, develop more valuable livestock and appreciate how our actions have caused the loss of species



## B6 Inheritance, variation and evolution



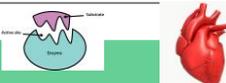
**Content** – Pathogens and diseases, human defences and the immune response, vaccination, antibiotics, drug discovery and development.

**Bigger Picture Focus** – To examine the different types of diseases and ways we can prevent their spread and treat them to save lives around the world.

## B5 Homeostasis and response

**Content** – Homeostasis, nervous system, hormonal coordination, blood glucose control, menstrual cycle, infertility and contraception

**Bigger Picture Focus** – To understand how we can manipulate the hormonal system to prevent pregnancy or help people have children if they are infertile

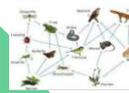


YEAR 11

## B7 Ecology

**Content** – Interdependence, adaptation, ecosystems, recycling materials, biodiversity and human impacts.

**Bigger Picture Focus** – To consider the impacts our actions have on other organisms and ways we can make positive changes.



**Content** – Cell division, stem cells and transport in cells

**Bigger Picture Focus** – To understand how stem cells can be used to treat diseases

## B1b Cells



YEAR 10

## B3 Infection and response



**Content** – Photosynthesis, rates of photosynthesis, aerobic and anaerobic respiration, responses to exercise and metabolism, plant organs and transport

**Bigger Picture Focus** – To understand the role of plants in our ecosystems and how, without them, we would not be here.

## B2b Organisation

**Content** – Enzymes, heart & blood, non-communicable diseases including heart disease & cancer

**Bigger Picture Focus** – To link how understanding how our bodies work enable scientists to develop a variety of ways of treating diseases.



## B1b Cells

### Key Skills:

- Recall and retention of scientific facts
- Analysing and interpreting data
- Evaluating information

### Useful websites and support

- GCSE bitesize
- GCSEpod
- Oak Academy
- Educake
- Savemyexams
- Physics and maths tutor

### Home Learning

- Weekly Educake quizzes
- BUG question 6-markers
- Home learning booklets
- Revision for end of topic exams and mock papers

## B2a Organisation



**Content** – Levels of organisation, food, digestion, enzymes,

**Bigger Picture Focus** – To understand how the food we eat is processed in the body.

## B1b Cells



**Content** – Cells, specialised cells, microscopy and diffusion.

**Bigger Picture Focus** – To develop the knowledge of how fundamental building blocks that make up living organisms function.

YEAR 9



Scan me to get to our specification!



## B4 Bioenergetics and plants



# Chemistry Key Stage 4 Overview

What is my Learning Journey for Year 9, 10 and 11?



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**Exams:**

Combined Science:  
6 x 75-minute papers – 2 for biology, 2 for chemistry, 2 for physics

**Assessments:**

- End of unit tests
- Weekly Educake quizzes
- 6-mark BUG questions

**#realworldready**

- Appreciate how scientific understanding can result in developments in industries such as agriculture, manufacturing (e.g. of perfumes and detergents) and forensic and analytical science.
- Use scientific knowledge to understand steps we can take to reduce negative impact on our environment.
- Understand the importance of science to a wide variety of careers.

**Useful websites and support**

- GCSE bitesize
- GCSEpod
- Oak Academy
- Educake
- Savemyexams
- Physics and maths tutor

- Weekly Educake quizzes
- BUG question 6-markers
- Home learning booklets
- Revision for end of topic exams and mock papers

Home Learning

**Content** – reversible reactions, effect of changing conditions on equilibrium.  
**Bigger Picture Focus** – To use knowledge of reaction rates to understand how ideal conditions for industrial reactions are decided upon.

**Content** – crude oil and alkanes, fractional distillation, properties of hydrocarbons, cracking, alkenes.  
**Bigger Picture Focus** – To understand how knowledge of carbon compounds can be used to develop useful products such as pharmaceuticals, perfumes and flavourings.

**Content** – Purity, formulations, chromatography, identification of common gases.  
**Bigger Picture Focus** – To link the importance of identification of chemicals to areas such as forensics and drug control science.



**C6b Rates**

**Content** – conservation of mass, chemical equations, amount of substance, limiting reactants, concentration of solutions.  
**Bigger Picture Focus** – To understand that use of equations is a key way for chemists to communicate ideas and how quantitative methods can be used to determine purity and yield of substances.

**C10 Using resources**

**Content** – sustainability, potable water, waste-water treatment, alternative methods of metal extraction, life cycle assessment and recycling.  
**Bigger Picture Focus** – To appreciate the sustainable use of resources in order to reduce environmental impact.

**C9 Chemistry of the atmosphere**

**Content** – Composition and evolution of the atmosphere, greenhouse gases, climate change, atmospheric pollutants and their sources.  
**Bigger Picture Focus** – To understand how knowledge of changes in the atmosphere over time are enabling us to take action to reduce human impact on climate change.

**C7 Organic chemistry**

**Content** – Reactivity of metals, reactions of acids, making salts, electrolysis of molten compounds and aqueous solutions.  
**Bigger Picture Focus** – To consider how knowledge of chemical changes aids in the development of new materials and processes and helps us to understand the complex reactions that occur in living organisms.

**C8 Chemical analysis**

**Content** – ionic, covalent and metallic bonding, states of matter, properties of ionic compounds, simple molecules, giant covalent structures, metals and alloys, allotropes of carbon.  
**Bigger Picture Focus** – To use information about structure and bonding to explain physical and chemical properties and understand how this can be used to develop new materials with desirable properties.



**C3 Quantitative chemistry**

**Content** – endothermic and exothermic reactions, reaction profiles, energy change of reactions.  
**Bigger Picture Focus** – To consider how interactions between particles in chemical reactions can result in heating or cooling effects that are useful in everyday life.

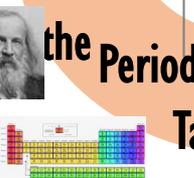
**C4 Chemical changes**

**Content** – calculating rates, factors affecting rates of reaction, collision theory  
**Bigger Picture Focus** – To use knowledge of reaction rates to understand the impact of different conditions on rates of reactions in industry

**C2 Structure & bonding**

**Content** – Atoms, ions and isotopes, models of the atom, development of the periodic table, trends in the modern periodic table, separating mixtures.  
**Bigger Picture Focus** – To understand how knowledge of the structure of atoms and the arrangement of elements in the periodic table allows us to predict their properties and reactions.

**C1 Atomic structure & the Periodic Table**



**C6a Rates of reaction**

**C5 Energy changes**



Scan this QR code to take you to the specification we study.

# Physics Key Stage 4 Overview

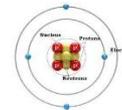
## What is my Learning Journey for Year 9, 10 and 11?



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**Content** – vectors, scalars, resultant forces, moments, centre of mass, parallelogram of forces, resolving forces, motion graphs, momentum, car safety, pressure, upthrust

**Bigger Picture Focus** – To break down how the objects in the world around us interact, and why they interact the way they do.



YEAR  
**11**



P4 Atomic Structure

**Content** – Atoms, the discovery of the nucleus, types of radiation, nuclear fission and fusion.  
**Bigger Picture Focus** – To know what everything is made from and the future of energy.

### Exams:

Combined Science:  
6 x 75 minute papers – 2 for biology, 2 for chemistry, 2 for physics.

### Assessments:

-End of unit tests  
- Weekly Educake quizzes  
-6-mark BUG questions

### #realworldready

- Appreciate how scientific understanding of Physics can explain everyday occurrences, and those that are out of this world.
- Understand how to minimise our impact on the Earth through our energy choices.
- Learn that we don't know everything yet and there are lots of unanswered questions.
- Understand the importance of science to a wide variety of careers.

### Useful websites and support

-GCSE bitesize  
-GCSEpod  
-Oak Academy  
-Educake  
-Savemyexams  
-Physics and maths tutor

### Home Learning

- Weekly Educake quizzes
- BUG question 6-markers
- Home learning booklets
- Revision for end of topic exams and mock papers

P6 Waves

**Content** – Wave properties, reflection and reflection, sound waves, EM spectrum, and contraception, waves in medicine, UV, X-Rays, Infra red radiation.

**Bigger Picture Focus** – To understand how there is more than just light around us, and it can be manipulated for our gain such as medical procedures.



**Content** – Calculating energy & power, calculating specific heat capacity. Conduction, convection, radiation

**Bigger Picture Focus** – To understand how we can save energy easily!



P5 Forces

**Content** – Resistance, current, potential difference, calculations, plug sockets, current, charge

**Bigger Picture Focus** – To understand what goes in to using everyday items such as a mobile phone, or a fridge, and the methods of bringing that electricity to your home.

P3b Particle model of matter

**Content** ;specific latent heat, specific heat capacity, gas, pressure, and temperature

**Bigger Picture Focus** – To link the states of matter to the energy required to change them, relating to everyday tasks like boiling a kettle, or heating up a home.

YEAR  
**10**

P1b Energy

**Content** – Magnetic fields, electromagnets, electric motors, generators, transformers, microphones and speakers.

**Bigger Picture Focus** – To understand how we can harness electricity through electromagnets

**Content** – Density, states of matter, internal energy.

**Bigger Picture Focus** – To link the states of matter to the energy required to change them, relating to everyday tasks like boiling a kettle, or heating up a home.

P2 Electricity

**Content** – Types of energy, energy resources, Conduction, convection, radiation

**Bigger Picture Focus** – To understand the role of plants in our lives and how vital it is we find alternative fuel sources.

P1a Energy

YEAR  
**9**

P3a Particle model of matter



P7 Magnetism

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# Chemistry Key Stage 5 Overview

## What is my Learning Journey for Year 12 and 13?

The exam board we use is OCR and the specification is H432 Chemistry A

**Exams:** 3 papers:  
 Periodic table, elements and physical chemistry–2h15mins  
 Synthesis and analytical techniques–2h15mins  
 Unified chemistry–1h30mins

**Assessments:**  
 -End of unit tests  
 -Recall quizzes to test recall  
 -Assessment of practical skills (PAGs)



A level exams

**Content – aromatic compounds, carboxylic acids and esters, organic nitrogen compounds: amines and amino acids, polymerisation: addition polymers and condensation polymers, synthetic organic chemistry and further development of practical skills, the importance of modern analytical techniques in organic analysis.**  
**Bigger Picture Focus –** To expand knowledge of organic chemistry with particular focus on aromatic compounds and polymers and apply this knowledge to enhance understanding of synthetic and analytical techniques in chemistry.

### Organic chemistry and analysis

### Physical Chemistry

**Content – rate equations, orders of reaction, the rate-determining step, equilibrium constants, Kc and Kp, acid–base equilibria including pH, Ka and buffer solutions, lattice enthalpy and Born–Haber cycles, entropy and free energy, electrochemical cells, redox chemistry, transition elements.**  
**Bigger Picture Focus –** To further appreciate the impact of different factors on rates of reactions that are used in industry, develop mathematical skills in relation to rates of reaction and equilibrium constants, expand knowledge of the periodic table and understand the importance of buffers e.g. in the human body.

**Content – atomic structure, quantitative chemistry: formulae, equations, amount of substance and the mole, reactions of acids, oxidation number and redox reactions, bonding and structure.**  
**Bigger Picture Focus –** To gain insight into the concepts that underpin chemistry by allowing understanding of properties and reactions. This understanding forms the foundations of developments in many industrial applications.

### Foundations in Chemistry

### Basic organic Chemistry

**Content – nomenclature and formula representation, functional groups, organic reactions and isomerism, aliphatic hydrocarbons, alcohols and haloalkanes, organic practical skills and organic synthesis, instrumental analytical techniques.**  
**Bigger Picture Focus –** To grasp an understanding of organic chemistry and its important applications in everyday life, including current environmental concerns surrounding sustainability. We study the reactions and properties of carbon compounds and consider appropriate processing of plastic waste and preventing use of ozone depleting chemicals.

Mock exam



YEAR  
13

Periodic table and energy



**Content – periodic and group properties, enthalpy changes and their determination, rates of reaction, reversible reactions and equilibrium, energy and yield in improving sustainability.**  
**Bigger Picture Focus –** To build on knowledge from the foundations in chemistry unit in order to understand the implications of energy use in industrial processes on sustainability.

**Key Skills:**

- Recall and retention of scientific facts
- Analysing and interpreting data
- Evaluating information

**#realworldready**

- Appreciate how scientific understanding can lead to developments in industry
- Apply chemistry knowledge to other subject areas to enhance understanding
- Develop practical skills
- Understand the importance of science to a wide variety of careers.

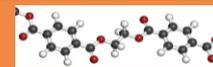
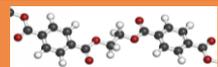
**Useful websites and support**

- Chemrevise
- Seneca
- Savemyexams
- Physics and maths tutor
- Free science lessons videos

Home Learning

Up Learn  
 Past paper questions  
 Consolidation practice  
 Pre-reading tasks and quizzes

YEAR  
12



# Biology Key Stage 5 Overview

## What is my Learning Journey for Year 12 and 13?

**Key Skills:**

- Recall and retention of scientific facts
- Analysing and interpreting data
- Evaluating information

**Exams:** 3 papers:  
 Biological processes – 2h15mins  
 Biological diversity – 2h15mins  
 Unified biology – 1h30mins

**Assessments:**  
 -End of unit tests  
 -Recall quizzes to test recall  
 -Assessment of practical skills (PAGs)

**#realworldready**

- Appreciate how scientific understanding can lead to the development of cures and treatments for diseases to save lives
- Understand how to minimise our impact on the organisms in the world around us
- Consider whether just because science allows us to manipulate organisms, should we be allowed to?
- Understand the importance of science to a wide variety of careers.

**Useful websites and support**

- Seneca
- Savemyexams
- Physics and maths tutor

**Home Learning**

- Up Learn
- Past paper questions
- Consolidation practice
- Pre-reading tasks and quizzes

The exam board we use is OCR and the specification is H420 Biology A

**Content –Cellular control, inheritance, manipulating genomes, cloning and biotechnology, ecosystems, populations and sustainability**

**Bigger Picture Focus –** The final module starts at a cellular and genetic level and then moves on to looking at new technologies at the cutting edge of medicine and science and current uses of biology in the real world. It ends by looking at ecosystems, human impacts on them and how this can be managed,

**Content – Homeostasis, excretion, neuronal & hormonal communication, plant & animal responses, photosynthesis & respiration.**

**Bigger Picture Focus –** This module includes lots of physiology (kidney & liver function, neurons), anatomy (structure of liver & kidneys) and then key responses to environment in plants & animals. It builds on biochemistry covered in unit 1 to look at photosynthesis & respiration.

### Genetics, evolution and ecosystems



### Communication, and energy hormones



YEAR 13

### Biodiversity evolution and disease



Mock exam

**Content – Communicable diseases, biodiversity and classification and evolution.**

**Bigger Picture Focus –** This module is split into two sections; one looks at pathogens and how our immune systems defends itself against them and other looks how we sample, calculate and maintain biodiversity which then links to classifying organisms and variation natural selections and evolution.

An additional unit is studied throughout the course and integrated into lessons; 'Development of practical skills in biology'.

YEAR 12

### Foundations in biology



### Exchange and transport



**Content – Cell structure, biological molecules, nucleic acids (DNA replication & protein synthesis), enzymes, biological membranes and cell division, cell diversity and differentiation.**

**Bigger Picture Focus –** To grasp how understanding organisms begins at a molecular and biochemical level leading on to understanding at an organelle and cellular level. These then are the foundations for understanding the complex life processes that occur within all organisms.

**Content – Exchange surfaces and breathing, transport in animals and transport in plants.**

**Bigger Picture Focus –** Having built up strong foundations of knowledge from the prior unit, this one looks to understand how organisms exchange substances with their environment and transport them around.



# Physics Key Stage 5 Overview

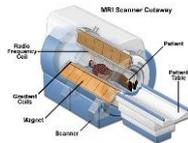
## What is my Learning Journey for Year 12 and 13?



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### Content – Electricity and Magnetism

**Bigger Picture Focus –** To explore more components, and how we are able to manipulate electricity to create devices, making sure we know how they will act in the real world.



### Content – Stars and cosmology

**Bigger Picture Focus –** To learn what we know and don't know about the universe, to explore the future of the universe, and where it all started from.

## Particles and Medical Physics

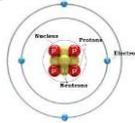
### Content – Medical imaging

**Bigger Picture Focus –** To combine previous topics to understand how medical imaging works and make judgements based upon risks and benefits.



### Content – Radioactivity and Nuclear Decay

**Bigger Picture Focus –** To understand where radioactivity comes, from how we create electricity from it, the future possibilities and the dangers.



## AstroPhysics



## Electrons, Waves, Photons

YEAR  
**13**

## Newtonian world

### Content – Motion, Forces, Energy, Materials, Moments

**Bigger Picture Focus –** To have a deeper understanding of how the world around us moved and interacts and explain those interactions mathematically and verbally.

### Content – Electrical Circuits

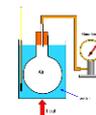
**Bigger Picture Focus –** To explain the inner workings of devices using enhanced knowledge of circuits, components, and Laws.

### Content – Waves & Quantum

**Bigger Picture Focus –** To learn of the parts of Physics that we are still exploring, starting with now we know matter interacts, to what we can't explain.

### Content – Units, Vectors, and Skills

**Bigger Picture Focus –** To understand the vocabulary and range of skills needed for practical work in Physics.



### Content – Thermal Physics, Motion in Space

**Bigger Picture Focus –** To understand the energy around us and how space was constructed, explaining many real-world phenomenon that we take for granted.

## Forces & Motion

## Foundations of Physics & Practical Skills

YEAR  
**12**

Home Learning

### Exams:

- 2 x 2 hr 15 minute papers – content learnt is split between the 2 papers.
- 1x 1 hr 30 minute paper – all content learnt is examined

### Assessments:

- End of unit tests
- Weekly quizzes
- Past paper questions
- Mock papers

### #realworldready

- Appreciate how scientific understanding of Physics can explain everyday occurrences, and those that are out of this world.
- Understand how to minimise our impact on the Earth through our energy choices.
- Learn that we don't know everything yet and there are lots of unanswered questions.
- Understand the importance of science to a wide variety of careers and research that will one day shape the way we live our lives.

### Useful websites and support

- MinutePhysics (youtube)
- Veritasium (youtube)
- Oak Academy
- Seneca
- Savemyexams
- Physics and maths tutor

### Key Skills:

- Recall and retention of scientific facts
- Analysing and interpreting data
- Evaluating information

- Up Learn
- Past paper questions
  - Consolidation practice
  - Pre-reading tasks and quizzes



# Year 7 Curriculum Overview- Subject

<b>Content</b> Topic/unit name, enquiry question	<b>Disciplinary Knowledge (Skills)</b> Actions taken within a topic to gain substantive knowledge	<b>Substantive Knowledge</b> This is the specific, factual content for a topic, which is connected into a careful sequence of learning	<b>Prior Learning (KS2)</b>	<b>Future learning (KS3)</b>
Around the lab and enquiry skills	Using all of the practical skills listed as substantive knowledge through a series of individual experiments each designed to teach a specific skill so all students start year 7 with the same basic tools needed in science	Lab safety Scientific apparatus Creating a hypothesis Writing a method Recording results Drawing a graph Evaluation	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary (KS2)	Skills used continually under the name "Working Scientifically" at GCSE
Energy	Interpret observations to draw conclusions for multiple experiment Complete practical work safely having due regard from accuracy	Food and energy Energy resources Energy and power calculations Energy adds up Efficiency and calculations	No prior knowledge.	Work Energy Machines Energy and temperature Energy Transfer Radiation and insulation
Organisms	Follow a method to safely complete experiments, - record observations, drawing conclusion from observations made. Practicals completed taking safety into account.	Levels of organization Skeletons, joints and muscles, microscopes, Plant and animal cells Respiration Photosynthesis Specialised cells Movement of substances	Identify that humans and some other animals have skeletons and muscles for support, protection and movement (Year 3) Know that the body is made up different organs (looked specifically at digestive system and circulatory system in Year 4 and 6) Recall definitions of cell, tissue, organ and organ system (from lesson 1 in unit)	Gas exchange Breathing Smoking Nutrients Food tests Unhealthy diet Enzymes in digestion

# Year 7 Curriculum Overview- Subject

<b>Content</b> Topic/unit name, enquiry question	<b>Disciplinary Knowledge (Skills)</b> Actions taken within a topic to gain substantive knowledge	<b>Substantive Knowledge</b> This is the specific, factual content for a topic, which is connected into a careful sequence of learning	<b>Prior Learning (KS2)</b>	<b>Future learning (KS3)</b>
Matter	Investigate stearic acids melting point through follow a method safely, recording observation into a table and plotting graphs to draw a conclusion Revisit types of variables Use models such as representational, spatial, descriptive to make predictions and to develop scientific explanations and understanding of unfamiliar knowledge Complete range of practicals on separation techniques to make observations	The particle model States of matter Changing state Diffusion Gas pressure Inside particles Purity Solutions and solubility Separation techniques Chromatography	Compare and group materials together, according to whether they are solids, liquids or gases Compare and group together everyday materials on the basis of their properties Compare and group materials together, according to whether they are solids, liquids or gases Decide how mixtures might be separated, including through filtering, sieving and evaporating	Elements, atoms, compounds, chemical formulae, polymers, the periodic table
Electromagnets	Using circuit symbols to draw and then create circuits to predict, observe, record, and evaluate results from series and parallel circuits Use a range of suitable equipment to measure resistance of different wires Correctly choose the variables for the experiment	Potential difference Resistance Series and parallel circuits Current and charge	Construct a simple series electrical circuit, identifying and naming its basic parts. Identifying and naming basic parts. Identify whether or not a lamp will light in a simple series circuit	Magnets and magnetic fields Electromagnets and their uses

# Year 7 Curriculum Overview- Subject

<b>Content</b> Topic/unit name, enquiry question	<b>Disciplinary Knowledge (Skills)</b> Actions taken within a topic to gain substantive knowledge	<b>Substantive Knowledge</b> This is the specific, factual content for a topic, which is connected into a careful sequence of learning	<b>Prior Learning (KS2)</b>	<b>Future learning (KS3)</b>
Genes	The need and importance of peer review on scientific theories.	Variation Continuous and discontinuous Adapting to survive Reproduction Fertilisation Development of a fetus Menstrual cycle	Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago	Natural selection Charles Darwin Extinction Biodiversity History of DNA Inheritance Genetic modification
Reactions	Follow a method safely to combine acids and alkalis using various other chemical solutions to observe outcomes, record results and make conclusions.	Chemical reactions Acids and alkalis Neutralisation Making salts Chemical reactions of metals and acids	Hazards and risks	Atoms in chemical reactions Combustion Thermal decomposition Conservation of mass Exo and endothermic reaction
Forces	Follow a method to safely complete experiments, - record observations, and plotting results demonstrating forces using equipment such as newton meters, stop watches and metre rulers,	What a forces is Balanced and unbalanced forces Calculating speed Distance time graphs Gravity & weight calculations	Types of forces Forces make things move How to draw graphs Gravity pulls us down	Friction and Drag Squashing and stretching Turning Pressure in gases Pressure in solids

# Year 7 Curriculum Overview- Subject

<b>Content</b> Topic/unit name, enquiry question	<b>Disciplinary Knowledge (Skills)</b> Actions taken within a topic to gain substantive knowledge	<b>Substantive Knowledge</b> This is the specific, factual content for a topic, which is connected into a careful sequence of learning	<b>Prior Learning (KS2)</b>	<b>Future learning (KS3)</b>
Ecosystems	Create a hypothesis , a plan a method, collect data and record correctly.	Food chains and webs Popoulation changes Germination Ecological sampling	Construct and interpret a variety of food chains, identifying producers, predators and prey Recognise that environments can change and that this can sometimes pose dangers to living things	
Waves	Use models such as representational, spatial, descriptive to make predictions and to develop scientific explanations and understanding of unfamiliar knowledge on sound waves Interpret observations to draw conclusions for amplitude and frequency using an oscilloscope Follow a method to accurately record results and make comments on the observations of reflection and refraction	Sound waves and speed Loudness and pitch The ear and hearing Light and eye Reflection Refraction Colour and revision	Recognise that vibrations from sounds travel through a medium to the ear That sound is made through vibration. Recognise that they need light in order to see things and that dark is the absence of light	
Earth	Use models such as representational, spatial, descriptive to make predictions and to develop scientific explanations and understanding of unfamiliar knowledge	Structure of Earth Rock cycles The solar system The moon	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe the movement of the Earth, and other planets, relative to the Sun in the solar system	Space topic in KS4 (if separate science chosen)

# Year 8 Curriculum Overview- Subject

<b>Content</b> Topic/unit name, enquiry question	<b>Disciplinary Knowledge (Skills)</b> Actions taken within a topic to gain substantive knowledge	<b>Substantive Knowledge</b> This is the specific, factual content for a topic, which is connected into a careful sequence of learning	<b>Prior Learning (KS2)</b>	<b>Future learning (KS3)</b>
Organisms	Follow a method and make accurate observations to explain the results of a food test to see if they contain proteins, starch, sugars, and fats.	Gas exchange Breathing Smoking Nutrients Food tests Unhealthy diet Enzymes in digestion	Organ systems Recognise the impact of diet, exercise, drugs and lifestyle on the way the body functions Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Describe the simple functions of the basic parts of the digestive system in humans	Respiration in the B4 unit at KS4
Energy	Use models such as representational, spatial, descriptive to make predictions and to develop scientific explanations and understanding of unfamiliar knowledge Make observations of demonstrations using new equipment such as an oscilloscope. Follow a method accurately to determine a conclusion from reflection and refraction.	Work Energy Machines Energy and temperature Energy Transfer Radiation and insulation	Types of energy (from year 8) Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) (KS2)	Energy stores and systems Conservation and dissipation of energy Efficiency National and global energy resources In P1a unit at KS4
Electromagnets	Create simple circuits following a method and circuit symbols learnt in class. Make observations of simple circuits and make predictions on whether a circuit will light up or not.	Magnets and magnetic fields Electromagnets and their uses	Observe how magnets attract or repel each other and attract some materials and not others and describe magnets as having two poles. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials	KS4 P7 uses magnets and compasses to find the direction of a magnetic field and making more complex electromagnets and experimenting how to make them stronger.

# Year 8 Curriculum Overview- Subject

<b>Content</b> Topic/unit name, enquiry question	<b>Disciplinary Knowledge (Skills)</b> Actions taken within a topic to gain substantive knowledge	<b>Substantive Knowledge</b> This is the specific, factual content for a topic, which is connected into a careful sequence of learning	<b>Prior Learning (KS2)</b>	<b>Future learning (KS3)</b>
Matter	Follow a method and make accurate observations to explain the results plotting results in a graph and concluding a relationship.	Elements, atoms, compounds, chemical formulae, polymers, the periodic table	Describe what an atom is Describe the difference between elements, mixtures, and compounds	KS4 learning about the same content in more detail looking at and predicting patterns in a periodic table and balancing equations
Reactions	Follow a method safely to combine acids and alkalis using various other chemical solutions to observe outcomes, record results and make conclusions.	Atoms in chemical reactions Combustion Thermal decomposition Conservation of mass Exo and endothermic reaction	Describe characteristics of a chemical reaction Word equations	C5 in KS4 learning about exo and endothermic reactions reactions and writing equations, and C3 looking at conservation of mass and chemical equations
Genes	Use models such as representational, spatial, descriptive to make predictions and to develop scientific explanations and understanding of unfamiliar knowledge	Natural selection Charles Darwin Extinction Biodiversity History of DNA Inheritance Genetic modification	Natural selection covered in prior lesson, Darwin mentioned in Y6/Y7 schemes Food chains/webs and interdependence. How fossils are formed, what fossils are. Inheritance Structure of a cell (nucleus and DNA) as well as inheritance.	B4 at KS4 looking at Inheritance, variation and evolution.

# Year 8 Curriculum Overview- Subject

<b>Content</b> Topic/unit name, enquiry question	<b>Disciplinary Knowledge (Skills)</b> Actions taken within a topic to gain substantive knowledge	<b>Substantive Knowledge</b> This is the specific, factual content for a topic, which is connected into a careful sequence of learning	<b>Prior Learning (KS2)</b>	<b>Future learning (KS3)</b>
Forces	Follow a method to safely complete experiments, - record observations, and plotting results demonstrating forces using equipment such as newton meters, stop watched and rulers.	Friction and Drag Squashing and stretching Turning Pressure in gases Pressure in solids	Types of forces Forces make things move How to draw graphs Gravity pulls us down	Learning what a vector and a scalar and then applying them to different scenarios. The addition of vectors. Calculating moments.
Waves	Use models such as representational, spatial, descriptive to make predictions and to develop scientific explanations and understanding of unfamiliar knowledge Make observations of different devices to draw conclusions of how light travels on the EM spectrum.	Sound waves, water waves and energy Radiation and energy Modelling waves	Use models such as representational, spatial, descriptive to make predictions and to develop scientific explanations and understanding of unfamiliar knowledge on sound waves Interpret observations to draw conclusions for amplitude and frequency using an oscilloscope Follow a method to accurately record results and make comments on the observations of reflection and refraction	P6 KS4 looking at the electromagnetic spectrum of light, sound waves, and how light interacts with matter.

# Year 9 Curriculum Overview- Subject

<b>Content</b> Topic/unit name, enquiry question	<b>Disciplinary Knowledge (Skills)</b> Actions taken within a topic to gain substantive knowledge	<b>Substantive Knowledge</b> This is the specific, factual content for a topic, which is connected into a careful sequence of learning	<b>Prior Learning (KS2)</b>	<b>Future learning (KS3)</b>
B1a Cells	Using light microscopes to observe draw and label a selection of plant and animal cells	Eukaryotes and Prokaryotes Animal and plant cells Cell specialization Cell differentiation Microscopy Culturing microorganisms Transport in cells	KS3 Organisms microscopes, Plant and animal cells Respiration Photosynthesis Specialised cells Movement of substances	KS5 A level Biology, Module 2: Foundations in biology – cell structure
P1a Energy	Make and record observation in a series of experiments using different types of energies as they transfer from one to another Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications	Energy stores and systems Conservation and dissipation of energy Efficiency National and global energy resources	KS3 Energy Work Energy Machines Energy and temperature Energy Transfer Radiation and insulation	.KS5 A level Physics, module 3: Forces and motion
C5 Energy changes	Investigate the variables that affect temperature changes in reacting solutions.	Exo and endothermic reactions including reaction profiles and the energy change of reactions.	KS3 Reactions Atoms in chemical reactions Combustion Thermal decomposition Conservation of mass Exo and endothermic reaction	KS5 A level Chemistry, module 3: Periodic table and Energy
P3a Particle model of matter	Use appropriate equipment to make and record measurements needed to determine the dimensions of regular and irregular shapes Use SI units and prefixes	Density of material Changes of state Internal energy	KS3 Matter The particle model States of matter Changing state Diffusion Gas pressure Inside particles	KS5 A level Physics, module 5 Newtonian world and astrophysics

# Year 9 Curriculum Overview- Subject

<b>Content</b> Topic/unit name, enquiry question	<b>Disciplinary Knowledge (Skills)</b> Actions taken within a topic to gain substantive knowledge	<b>Substantive Knowledge</b> This is the specific, factual content for a topic, which is connected into a careful sequence of learning	<b>Prior Learning (KS2)</b>	<b>Future learning (KS3)</b>
B2a Organisation	Use qualitative reagents to test for a range of carbohydrates, lipids, and proteins including Benedicts solution, iodine and Biuret	Principles of organisation Human digestion system	KS3 Organisms Enzymes in digestion Unhealthy diet KS2 Describe the simple functions of the basic parts of the digestive system in humans	KS5 A level Module 4 Biodiversity, Evolution, and Disease
C6a Rates of reaction	Develop a hypothesis then investigate how change in concentration affect the rates of reactions by a method involving turbidity and a volume of gas produced Interpret observations Presenting observations and data appropriately	Rate of reaction Factors which affect the rate of reactions Collision theory and activation energy Catalysts	KS3 Reactions Atoms in chemical reactions Conservation of mass Exo and endothermic reactions Chemical reactions Chemical reactions of metals and acids	KS5 A level Chemistry, module 3: Periodic table and energy
P7a Electromagnets	Using magnets and a compass observe and draw the magnet fields lines around a magnet Using a bar magnet and iron fillings to explain how magnets and magnetic fields interact between 2 magnets Follow a method and record results for how many paper clips can be picked up using a solenoid and then an electromagnet. Evaluate methods and suggest possible improvements	Poles of a magnet Magnetic fields The motor effect	KS3 Electromagnets Creating basic circuits with circuit symbols. Creating basic electromagnets.	KS5 A level Physics module 6: Particles and medical physics

# Year 9 Curriculum Overview- Subject

<b>Content</b> Topic/unit name, enquiry question	<b>Disciplinary Knowledge (Skills)</b> Actions taken within a topic to gain substantive knowledge	<b>Substantive Knowledge</b> This is the specific, factual content for a topic, which is connected into a careful sequence of learning	<b>Prior Learning (KS2)</b>	<b>Future learning (KS3)</b>
B4 Bioenergetics	The effect of light intensity on the rate of photosynthesis.	Photosynthesis Respiration	KS3 Organisms Levels of organization Skeletons, joints and muscles, microscopes, Plant and animal cells Respiration Photosynthesis Specialised cells Movement of substances	KS5 A level biology Module 5: Communication, homeostasis, and energy
C1 Atomic Structure	The need and importance of peer review on scientific theories.	Simple model of the atom, symbols, relative atomic mass, electronic charge and isotopes. The periodic table.	KS3 Matter Elements, atoms, compounds, chemical formulae, polymers, the periodic table	KS5 A level Chemistry, module 2: Foundations in Chemistry