Key Stage 3 Science

We have designed a vibrant and creative curriculum for our students. The topics have been planned to provide plenty of opportunity for investigative work and to promote independent learning.

Year 7 topics

In Year 7, science is taught in mixed ability groups by one teacher, and the topics include themes from Biology, Chemistry and Physics, with a crucial emphasis on investigative skills
Each of the topics has an assessment during the year.
In the final weeks of Year 7 we also run a formal end of year exam, which in conjunction with the other assessments carried out will help to generate an end of Year 7 level for every student.

Topic	Timings
Passport to safety **Scientific enquiry**	**September - November**
Shocking stuff **Colourful chemistry**	**November - March**
Cells and reproduction **CSI Cowley**	**March - July**

Passport to safety

In this brief introductory topic students will learn how to conduct themselves safely and sensibly in a laboratory. Students will gain basic laboratory skills and they will learn about identifying hazards and how to assess and minimize risks.

Scientific enquiry

This topic contains a range of practical activities designed to develop the key scientific skills of planning, conducting, analysing and evaluating investigative work. It also reinforces the skills of thinking scientifically and communicating and collaborating in Science.
This topic will be formally assessed using an end of topic test.

Shocking stuff

In this physics topic, students will investigate electricity and magnetism. They will carry out investigations to study static electricity and discuss its applications. They will investigate conductors and insulators and will make and test electrical circuits and discuss electrical safety. They will also investigate the phenomena of magnetism and electromagnetism, and again look at applications in every day life.
This topic will be formally assessed using an end of topic test.

Colourful Chemistry

In this chemistry topic, students will investigate acids, alkalis and indicators and conduct some basic chemical reactions. They will carefully design and conduct investigative work and record their observations.
Students will learn how to make indicators using a variety of different plants and will compare their results to those achieved using Universal Indicator.
This topic will be formally assessed using an end of topic test.

Cells and reproduction

In this biology topic, students will carry out careful microscope observations and study specialised cells, tissues and organs. In the reproduction topic, we will give the students a basic knowledge of the facts concerning development at puberty and human reproduction, within the context of family life and relationships based on Christian Principles and Catholic teaching.
The Science content is of a factual, biological nature, dealing with puberty, sexual intercourse, the development of a baby from conception through to birth and the first few weeks after birth.
If you have any questions or concerns regarding this topic, please feel free to contact the Science department at school.
This topic will be formally assessed using an end of topic test.

CSI Cowley

A summer term favourite. This topic brings together many of the skills learned throughout the year and provides more opportunity to understand the applications and implications of science. Students will be thinking scientifically, using forensic investigative approaches to solve the crimes and working critically with evidence. They will need to communicate well and work collaboratively.

Year 8 topics

In Year 8, science is taught as three separate disciplines, each taught by a subject specialist.
Each of the sciences will run separate assessments during the year.
In the final weeks of Year 8 we also run a formal end of year exam, which in conjunction with the other assessments carried out will help to generate an end of Year 8 level for every student.

Year 8 Biology

Topic	Timings
Food and digestion	**September – December**
Breathing, circulation and respiration	**January - April**
Zoo Quest	**May – July**

Food and Digestion

In this unit students learn about healthy diet and the digestive system through a combination of practical work and research. Students demonstrate what they have learnt through use of a scientific model and the 'Storytelling' approach to help them explain the concept of digestion.

Breathing, circulation and respiration

In this topic students learn about two major body systems: the Respiratory (Breathing) System and the Circulatory System. Through classroom investigations and independent and group research projects students gain an understanding of how these systems work together in animals.
This topic will be formally assessed using an end of topic test.

Zoo Quest

Students learn about ecological relationships and the classification of living things. They develop an understanding of the human impact on the environment and the importance of conservation work. They apply this knowledge to create their own

model of a zoo enclosure. They must take into account the natural habitat, adaptations, behaviours and diet of their chosen creature.

Year 8 Chemistry

Topic	Timings
Atoms, elements, compounds and mixtures	**September - February**
Earth Sciences	**March - July**

Atoms, elements, compounds and mixtures

In this topic, students investigate how we can explain materials and their properties and changes of state in terms of the particles which make up the substance. They then further develop this to apply it to chemical reactions. They will look at the similarities and differences between atoms and be able to explain how the differences help us to understand different chemical reactions. They will then look at how compounds are created and how they are different to mixtures. Finally they will study different way to separate and break up compounds back to elements. This topic will be formally assessed using an end of topic test.

Earth Sciences

In this topic, students study the properties of rocks and look at weathering and erosion processes. They will look at the different types of rock and how they are formed. They will then look at fossil formation and volcanoes. All this knowledge is then bought together in the rock cycle.

Year 8 Physics

Topic	Timings
Light and Sound	**September – December**
Wonders of the solar system	**January - April**
Energy and energy resources	**May – July**

Light and Sound

In this topic, students learn all the fun and interesting facts about the science of light and sound. This unit includes a wide variety of investigative work. In the light topic they will investigate shadows, reflection, refraction, dispersion and colour, as well as the nature of images produced by the eye or a camera. In the sound topic students will use their imagination and creative skills to make musical instruments. They will learn about what affects pitch and volume and use oscilloscopes to “see” sound waves. They will also use sound meters to investigate noise and develop this into soundproofing. This topic will be formally assessed using an end of topic test.

Wonders of the solar system

In this topic students will explore the wonders of our solar system. They will start with getting to know about our Earth, looking at causes of day and night, and seasons. They then travel to our nearest neighbour, the moon, and study phases of the moon. They then journey to each of the planets and moons in our solar system, using their research skills to learn exciting facts about each. During the topic they prepare a travel brochure and presentation, on which they are assessed. This topic will also be formally assessed using an end of topic test.

Energy and energy resources

In this topic students will learn about the different forms of energy and how energy can be transferred from one form to another in different situations. They will study how we generate the energy we need in our everyday lives, looking at what makes a good fuel and how power stations generate electricity. They will further develop this by looking at the advantages and disadvantages of different energy resources.

Year 9 topics

In Year 9, science is taught as three separate disciplines, each taught by a subject specialist.
Each of the sciences will run separate assessments during the year.

In order to generate an end of KS3 level for every student we also run a series of three formal assessments which include content from across Years 7, 8 and 9. These assessments take place in December, March and June.

Year 9 Biology

Topic	Timings
Microbes and disease	**September – October**
Variation and genetics	**November - December**
Fit and healthy	**January - March**
Plants and photosynthesis	**April - May**
Investigative Skills and Scientific Enquiry	**June – July**

Microbes and Disease

In this topic students learn about the different types of microbes and the causes of disease, medicines and food safety. They learn about the history of human disease and treatments. They develop evaluative skills through debating the use of certain medicines such as antibiotics and vaccines.

Variation and genetics

In this topic students learn about how the characteristics of living things are determined by the interaction of genes and environment. Students apply their knowledge to explain the variation between people. Students develop their numeracy for science skills, including collection, presentation and analysis of data.

Fit and Healthy

Students learn about the structure and function of the human skeletal system. They also apply their knowledge of biology from Years 7, 8 and 9 to explore the legal, moral and ethical issues surrounding the use of alcohol, tobacco and drugs. They consider the impact of certain lifestyle choices on health.

Plants and Photosynthesis

Through practical work students develop their observational skills whilst immersing themselves in the fascinating world of plants. Using microscopes and appropriate staining methods, they observe the various plant tissues relating their structures to the process of photosynthesis. The also investigate the effects of light on the rate of photosynthesis.

Investigative Skills and Scientific Enquiry

In this topic students will develop their experimental skills by carrying out investigations. Students will gain experience in planning investigations, as well as develop their practical skills. This will lead onto being able to interpret and analyse data in order to draw conclusions. These skills will then be applied to an investigation in the style of the GCSE practical assessment that pupils will do in Year 10, therefore allowing students to gain an insight into the style of assessment they will be required to complete in future years.

Year 9 Chemistry

Topic	Timings
Chemical reactions	**September – December**
Environmental Chemistry	**January – March**
Investigative Skills and Scientific Enquiry	**April – July**

Chemical reactions

In this topic students will build on their knowledge from their study of atoms, elements, compounds and mixtures in Year 8. Students will further develop their understanding of particles by studying chemical reactions and will be able to describe what happens during a reaction by writing word equations. They will develop their understanding of chemical reactions by looking at different types of reactions, including combustion and thermal decomposition. Students will then look specifically at the reactions of metals, the products that are formed and learn how we can test for common gases released during reactions.
This topic will be formally assessed using an end of topic test.

Environmental Chemistry

In this topic students will further develop their understanding of the Earth and its composition from Year 8. Students will look at the composition of Earth's atmosphere as well as how human activity is impacting climate. Students will study the carbon cycle and develop an understanding of the resources the Earth provides and how these resources have increasingly limited availability.

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Year 9 Physics

Topic	Timings
Lighthouse project	**September - October**
Forces and their effects	**November - May**
Scientific Enquiry	**June - July**

Lighthouse project

The focus of this unit is to develop students' team building, self-managing and analytical skills. The aim of the project is to get students to work in groups on building a free-standing lighthouse model of certain height with a functional light on top of the structure that can be switched on and off. Students have to achieve the above whilst working within certain restrictions in available material and time and they will have to collaborate with other group members and use their scientific knowledge and analytical skills in order to build the model.

Forces and their effects

In this topic, students will learn all about forces and the effects that they have on objects. They will identify common forces and investigate how the sizes of these forces affect the speed, direction or shape of an object. This unit contains lots of investigative work which allows students to further develop their planning, carrying

out, analysing and evaluating skills. They will also investigate how to measure the speed of moving objects and how this speed can be altered by changing the shape of the object to change the frictional forces it experiences.
They will also investigate the pressure that an object exerts on a surface, how this can be changed and look at examples of this in every day life.

Scientific Enquiry

In this final short unit students are given opportunity to consolidate their practical skills. Given a hypothesis, they will carefully design investigative work. This will further develop their planning and observational skills and provide opportunity to work with data and consolidate their analytical and evaluation skills. These provides excellent preparation for the increased demands of investigative work at GCSE.