Science

For more information, please consult:

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Learning Aims / Learning Objectives

KS3 Science provides a foundation for the students at Giles Academy to understand the world around them through the teaching of Biology, Chemistry and Physics. Students are taught essential aspects of knowledge, methods, processes and uses of science. This foundation aims to encourage our students to recognise the power and importance of rational explanation and develop their excitement and critical curiosity about the world around us. They are encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse the causes.

What will I be learning and progressing to each year?

Year	Key Knowledge	Key Skills	Key Vocabulary
7	During KS3, students will acquire knowledge and understanding within the field of Biology, which includes: the structure and functions of living things, material cycles and energy, interactions & interdependencies, genetics & evolution; Chemistry, which includes: the particulate nature of matter, atoms, elements & compounds, pure and impure substances, chemical reactions, energetics, the periodic table, materials and the Earth & atmosphere; Physics, which includes: energy, motion & forces, waves, electricity & magnetism, matter and space physics.	Students develop their 'working scientifically' skills as they progress through this course. These are skills that enable students to think about scientific problems, process and analyse data and communicate their ideas clearly and logically.	For each unit studied, there are key vocabulary lists available, with definitions.
	Link to knowledge organiser here	**Link to homework here**	**Link to full Y7 vocabulary here**

The content of your curriculum in this academic year for your subject

The scheme of work is split into the three traditional areas of Science: Biology, Chemistry and Physics. Within each area, there are 4 units that taught to all students.

Biology

Cells, Tissue, Organs and Systems
This unit starts by reminding students about the features of organisms, and then looks at organs, tissues and cells. These ideas are then built back up in order to look at organs once again, in the context of organ systems.

Sexual Reproduction in Animals
This unit explores sexual reproduction in animals, however, the central focus for learning is the human reproductive system and sexual reproduction in humans.

Muscles and Bones
This unit uses a 'fitness' theme to cover three important organ systems: the gas exchange system, the circulatory system and the locomotor system. The various effects of drugs on these systems are also considered, together with their effects on the nervous system.

Ecosystems
This unit looks at ecosystems and the factors that affect them. This includes the impact of human activity and the importance of biodiversity.

Chemistry

Mixtures and Separation
This unit revises and builds on work in Key Stage 2 on materials, specifically on mixtures, solutions and separation techniques.

Acids and Alkalis
This unit looks at acids and alkalis and how they are described using a pH number. It looks at neutralisation reactions and some of their uses, and also introduces standard hazard symbols.

The Particle Model
This unit develops an understanding of the different properties of solids, liquids and gases. Scientific method and ideas on experiments, observation, hypotheses and theories are discussed, leading to an understanding of the particle theory of matter.

Atoms Elements and Compounds
This unit uses the context of resources from the Earth and atmosphere to introduce ideas about the make-up of matter. It expands on particle theory and explains the differences between atoms, and molecules, elements and compounds. It looks at the symbols and formulae for elements and compounds. The involvement of chemical reactions in the formation and decomposition of compounds is also covered. It links these with the more abstract ideas of particle models, naming compounds and word equations.

Physics

Energy
This unit introduces the idea that stores of energy are needed to make most things happen. It looks at food, energy stores and transfers, and energy resources in terms of non-renewable fuels and renewable resources.

Current Electricity
This unit looks at the measurement of current and how it behaves in series and parallel circuits, and at voltage and resistance. Various models for thinking about what is happening in circuits are explored, and the unit concludes by looking at how we use electricity safely.

Forces
This unit revises the concepts of forces and their effects and extends students' knowledge of friction, gravity and springs.

Sound
This unit looks at how sounds are made, transmitted and detected; some uses of sound and compares sound waves with waves on the surface of water.

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	Link to knowledge organiser here	**Link to homework here**	**Link to full Y10 vocabulary here**

The content of your curriculum in this academic year for your subject

The scheme of work is split into the three traditional areas of Science: Biology, Chemistry and Physics. Within each area, there are 4 units that taught to all students.

Biology

Food and Nutrition
This unit looks at the main components in the human diet and why they are needed. The digestive system is also covered in some detail, and the idea of enzymes is introduced.

Plants and their Reproduction
This unit covers reproduction in plants, both sexual and asexual, although the former is of chief importance. Classification and biodiversity are also covered. The theme that is threaded through the unit is the various uses that we have for plants

Breathing and Respiration
Under the broad theme of water sports, this unit covers gas exchange in humans and other organisms, together with details of aerobic and anaerobic respiration in humans.

Unicellular Organisms
This unit takes a detailed look at what unicellular organisms are, the differences between different types, their problems and their uses.

Chemistry

Combustion

	This unit introduces combustion and oxidation reactions, including those of hydrocarbons, metals and non-metals. The idea of an exothermic reaction is introduced and there is also a look at the pollution of the air by the products of fossil fuel combustion. There are opportunities to discuss the impact of global warming and methods for controlling carbon dioxide emissions. **The Periodic Table** This unit develops students' understanding of matter, atoms and chemical and physical change. Students then look at using the trends in the periodic table to make predictions about physical and chemical properties of elements and their compounds. **Metals and Their Uses** This unit reviews common physical properties of metals and introduces their main chemical properties. The idea that reactions can occur at different speeds is also illustrated and this leads to the introduction of the general reactivity series of metals. **Rocks** This unit examines the different types of rock and the processes that bring about their formation, leading to the idea of a rock cycle that operates within a huge geological timescale. It also looks at the Earth as a source of resources and the advantages of recycling metals. **Physics** **Fluids** This unit looks at changes of state, and then goes on to look at fluids and some of their effects, including pressure, floating and sinking, and drag. **Light** This unit revises work from KS2 on light, which is then extended to consider how light travels and what happens when it meets an object. **Energy Transfers** This unit looks at energy transfers by heating in the context of homes. **Earth and Space** This unit builds on work from KS2 on the Solar System and looks at the Earth, including the seasons and the Earth's magnetic field and gravity. It also looks at the Solar System and what is beyond the Solar System.
How will my work be assessed? / assessment components / frequency / term	
Y7	On entry to Year 7, an examination is taken to provide a base line assessment of Key Stage 2 Science. Students will complete an end of topic test for each of the 12 units studied and towards the end of the summer term, they will sit and end of Year examination.

Y8	Students will complete an end of topic test for each of the 12 units studied and towards the end of the summer term, they will sit an end of year examination.

Extra-curriculum activities / Trips / Community cohesion / Events participation

Year 7 Students take part in the Race for the Line competition where the Science, Design Technology, Mathematics and the ICT Departments work together to support students in design and build model rocket cars to race. The winning teams then represent the school at a regional final, where if successful; have the opportunity to compete Nationally.
This year we took part in Biology Week. We invited students from the local primary school and all classes had the opportunity to take part in lessons that would encourage an interest in Biology. As part of this week, students were selected from each Year group to visit Frampton Marsh and study the biological systems that can be found there.
Salters Chemistry Festival – Four Year 8 students are selected to represent the school in this competition
Year 7 students all visited the Gravity Fields Festival in Grantham this academic year

What qualifications and career paths this subject will enable me to access in KS4? KS4 option subjects / Career Paths

Science provides students with an excellent opportunity to develop their investigative skills, problem solving skills and to understand how science can be applied in the work place. There are many careers where a qualification in science will be useful and in some cases essential. These include the following: Medicine, Veterinary Science (including nursing), Dentistry, Nursing, Engineering, Research & Development, Architecture, Education many professions within the ICT world, amongst many others.

How parents or other members of the public can find out more about the curriculum your subject is following

We follow Pearson's Exploring Science Scheme of Work at KS3 in order to ensure consistency and progression throughout he 5 years students are taught Science. The specification we use is the Edexcel GCSE Combined Science (9-1) which is also supported by resources provided by Pearson's.

KS3 Science National Curriculum can be found at: https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study

5 Year Scheme of Work (2.5 Years KS3 and 2.5 Years KS4) can be found at:
https://www.pearsonschoolsandfecolleges.co.uk/secondary/Science/11-16/Edexcel91GCSEScience2016/FreeResources/FreeResources.aspx