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GEORGE PINDAR SCHOOL

Curriculum Progression Pathway for Science
Subject Intent: Our vision for Science at George Pindar School is a curriculum that is inclusive and aspirational for all students, which develops an appreciation of the uses and significance of science to society and their own lives as well as the contribution that science has made in the past. **The curriculum has been designed as a 5 year programme that builds on Science at KS2 and prepares students for further study and the world of work at KS5. The National Curriculum is covered at both KS3 and KS4. The most important concepts in the three scientific disciplines run as golden threads through the whole curriculum. For example: The Cellular Basis of Life; Organisms and their Environment; Substances and their Properties; Dynamic Earth; Matter; Electricity and Magnetism**
Why is the study of Science important? A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. As students learn science, they will also learn about its uses and significance to society and their own lives. It is not just a subject to be covered in school and then forgotten as students move into the next part of their lives. A good understanding of the three scientific disciplines, Biology, Chemistry and Physics, allows all of us to make sense of information that we meet in our everyday lives. From health and medical information so that we can live healthy lives, the materials that we encounter and why, as humans, we are endeavouring to make changes to the way we manufacture and produce energy to reduce our impact on our world, to making sense of information presented to us in the media (social media, newspapers, television or other sources) so that we can appreciate when it has been oversimplified or provided by an unreliable or biased source.
What skills will the study of Science teach you? Science aims to ensure that you develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics develop understanding of the nature, processes and methods of science through different types of science enquiries that help you to answer scientific questions about the world around you. You will be equipped with the scientific knowledge required to understand the uses and implications of

science, today and for the future.

What will you know and understand from your study of Science?

- **Working Scientifically:**
  - The development of scientific thinking
  - Experimental skills and strategies
  - Analysis and evaluation
  - Vocabulary, units, symbols and nomenclature

- **Biology:**
  - Cellular Basis of Life
  - Heredity and Life Cycles
  - Organisms and their Environment
  - Variation, Adaptation and Evolution
  - Health and Disease

- **Chemistry**
  - Substances and Properties
  - Particles and Structure
  - Chemical Reactions
  - Earth Chemistry
  - Dynamic Earth

- **Physics**
  - Matter
  - Forces and Motion
  - Sound, Light and Waves
  - Electricity and Magnetism
  - Earth in Space

How does your study of Science support your learning in other subjects?

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As a result of studying Science you will develop your skills in communication that are needed for all your subjects. The numeracy skills developed in mathematics are used widely in many subjects and developed and practised in Science.
Knowledge and skills developed in Science are transferable to subjects such as PE, Geography, History, Music, Art, Health and Social Care, Hair and Beauty and Technology subjects.
Studying science provides repeated encounters of content covered in other subjects, allowing you to retrieve and develop your wider understanding of these. For example climate change, the causes and impact, are covered in Biology, Chemistry and Physics as well as Geography

How can you deepen your understanding of Science?
Opportunities to link the products and practices of Science to STEM subjects are signposted in lessons and will allow you to develop a wider understanding of how the three science subjects relate to the wider world. By developing your ability to compare different views on science ideas and evaluate the use of science you will be developing higher order thinking skills. Watching documentaries and visiting museums can also enhance the knowledge and skills you learn in lessons by allowing you to think deeper and get more involved in the scientific concepts being studied.

How can Science support your future?
Science provides the foundation for a range of diverse and valuable careers that are crucial for the economic, environmental and social development of the UK and the world. There are obvious careers that link directly to the study of GCSE Science, 'A' level Sciences and higher level Science qualifications, e.g medical careers, research scientists, engineering.
However, there are many, less obvious, careers that rely on a good understanding of Science. Games designers must have a detailed understanding of forces to ensure that virtual interactions between objects reflect the reality of how they would in the real world; new medicines need to be developed, and these often use computer modelling to support this. As the world develops and becomes a place of international competition, having the key skills and ability to retain large amounts of information becomes increasingly valued. Some careers that rely on your scientific knowledge may not have even been invented yet!
The National Careers Service provides careers information, advice and guidance as a starting point to find links to content covered in the Science curriculum.
https://nationalcareers.service.gov.uk/

Exam board used in Y10 & Y11
For combined science: AQA Combined Science: Trilogy 8464
For Separate science (triple science) AQA Biology 8641 AQA Chemistry 8642 AQA Physics 8643

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BIOLOGY CURRICULUM PROGRESSION PATHWAY (Y7 and Y9 are a new Trust aligned Curriculum, Y8, Y10 and Y11 are legacy)					
	Year 7	**Year 8**	**Year 9**	**Year 10**	**Year 11**
Autumn 1	Introduction to the lab Cells	Food and Digestion	Cell Biology	Organisation and the Digestive System Transport in Animals	Organisms in the Environment Feeding Relationships and Cycling Cell Division and Inheritance
Autumn 2	Body Systems	Food and Digestion Fit and Healthy	Cell Division	Transport in Animals Non-Communicable Disease	Cell Division and Inheritance
Spring 1		Variation, Inheritance and Selection	Organisation and the Digestive System		Homeostasis and the Nervous System Variation and Evolution
Spring 2	Reproduction	Respiration	Organisation and the Digestive System Transport in Animals	Plant Biology	Genetic Technologies Human Impact on the Environment Hormonal Control Food Production (TS)
Summer 1		Respiration Environment and Feeding Relationships	Transport in Animals	Communicable Diseases	Hormonal Control Revision
Summer 2		Environment and Feeding Relationships Skeleton and Muscles Plant Reproduction	Organisms and Their Environments		Revision

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CHEMISTRY CURRICULUM PROGRESSION PATHWAY (Y7 and Y9 are a new Trust aligned Curriculum, Y8, Y10 and Y11 are legacy)					
	Year 7	**Year 8**	**Year 9**	**Year 10**	**Year 11**
Autumn 1	Introduction to the lab Materials Particles	Compounds and Mixtures	Mixtures and Separation	Ions	Chemical Analysis Atmosphere Organic Chemistry (TS)
Autumn 2	Separation techniques	Rocks	Atomic Structure	Chemical Changes	Rate of Reaction Ammonia production (TS)
Spring 1	Atoms, Elements and Compounds	Rocks	Atomic Structure	Covalent Molecules Reactivity Series of Metals	Rates of Reaction Sustainable Development and Water Using Resources and Polymerisation (TS)
Spring 2	Atoms, Elements and Compounds	Properties of Materials Metal Reactions and Reactivity	The Periodic Table	Chemical Calculations Electrolysis	Sustainable Development and Water
Summer 1			The Earth's Atmosphere	Electrolysis Energy Changes Atmosphere	Revision
Summer 2				Atmosphere Hydrocarbons	Revision

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PHYSICS CURRICULUM PROGRESSION PATHWAY (Y7 and Y9 are a new Trust aligned Curriculum, Y8, Y10 and Y11 are legacy)					
	Year 7	**Year 8**	**Year 9**	**Year 10**	**Year 11**
Autumn 1	Introduction to the Lab Energy 1	Magnets and Electromagnets Heating and Cooling		Conservation and Dissipation of Energy	Forces in Balance Moments (TS) Pressure (TS)
Autumn 2	Energy 1	Sound and Hearing	Conservation and Dissipation of Energy	Electrical Circuits Electricity in the Home	Motion
Spring 1	Forces	Gravity and Space	Energy by Heating and Energy Resources	Electricity in the Home Radioactivity	Waves EM Spectrum
Spring 2	Sound and Light	Gravity and Space		Radioactivity	Visible Light (TS)
Summer 1	Sound and Light Energy 2	Light	The Particle Model of Matter		Revision
Summer 2	Space		The Particle Model of Matter		Space Physics (TS) Revision