

## KS4 Links to National Curriculum

### Science

BBG teaching session (→)	Animal Handling	Rainforest Challenge	Gardens Tour	Glasshouse Tour	Photosynthesis, The Planet and Me	Natural Art	Japanese Challenge
Working scientifically (all years)	*	*	*	*	*		
<b>Biology</b>							
Living organisms may form populations of single species, communities of many species and ecosystems, interacting with each other, with the environment and with humans in many different ways	*	*	*	*	*		
Living organisms are interdependent and show adaptations to their environment	*	*	*	*	*		*
Life on Earth is dependent on photosynthesis in which green plants and algae trap light from the Sun to fix carbon dioxide and combine it with hydrogen from water to make organic compounds and oxygen		*	*	*	*		
Organic compounds are used as fuels in cellular respiration to allow the other chemical reactions necessary for life	*	*	*	*	*		
The chemicals in ecosystems are continually cycling through the natural world	*	*	*	*	*	*	
The characteristics of a living organism are influenced by its genome and its interaction with the environment	*	*	*	*	*	*	
Evolution occurs by the process of natural selection and accounts both for biodiversity and how organisms are all related to varying degrees	*	*	*	*	*	*	
Cells as the basic structural unit of all organisms; adaptations of cells related to their functions; the main sub-cellular structures of eukaryotic and prokaryotic cells					*		
The importance of cellular respiration; the processes of aerobic and anaerobic respiration					*		
Carbohydrates, proteins, nucleic acids and lipids as key biological molecules					*		

The need for transport systems in multicellular organisms, including plants	*	*	*	*	*		
Photosynthesis as the key process for food production and therefore biomass for life	*	*	*	*	*		
The process of photosynthesis		*	*	*	*		
Factors affecting the rate of photosynthesis		*	*	*	*		
Levels of organisation within an ecosystem	*	*	*	*	*		
Some abiotic and biotic factors which affect communities; the importance of interactions between organisms in a community	*	*	*	*	*		
How materials cycle through abiotic and biotic components of ecosystems	*	*	*	*	*		
The role of microorganisms (decomposers) in the cycling of materials through an ecosystem	*	*	*	*	*	*	
Organisms are interdependent and are adapted to their environment	*	*	*	*	*		
The importance of biodiversity	*	*	*	*	*		
Methods of identifying species and measuring distribution, frequency and abundance of species within a habitat	*	*	*	*	*		
Positive and negative human interactions with ecosystems	*	*	*	*	*		*
How the genome, and its interaction with the environment, influence the development of the phenotype of an organism	*	*	*	*	*		
Single gene inheritance and single gene crosses with dominant and recessive phenotypes	*	*	*	*	*		*
Genetic variation in populations of a species	*	*	*	*	*		
The process of natural selection leading to evolution	*	*	*	*	*		
The evidence for evolution	*	*	*	*	*		
Developments in biology affecting classification	*	*	*	*	*		*
The importance of selective breeding of plants and animals in agriculture	*	*	*	*	*		*
The uses of modern biotechnology including gene technology; some of the practical and ethical considerations of modern biotechnology	*	*	*	*	*		

<b>Chemistry</b>							
Balanced chemical equations, ionic equations and state symbols					*		
Factors affecting reversible reactions					*		
Evidence, and uncertainties in evidence, for additional anthropogenic causes of climate change	*	*	*	*	*		
Potential effects of, and mitigation of, increased levels of carbon dioxide and methane on the Earth's climate	*	*	*	*	*		
<b>Physics</b>							
Renewable and non-renewable energy sources used on Earth; changes in how these are used	*	*	*	*	*		

### Mathematics

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Interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning		*					*
Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems		*					*
Select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems; interpret their solution in the context of the given problem		*					*

### English

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Understand and critically evaluate texts through: reading in different ways for different purposes, summarising and synthesising ideas and information, and evaluating their usefulness for particular purposes		*					*

Make an informed personal response, recognising that other responses to a text are possible and evaluating these		*					*
Consolidate and build on their knowledge of grammar and vocabulary through: drawing on new vocabulary and grammatical constructions from their reading and listening, and using these consciously in their writing and speech to achieve particular effects	*	*	*	*	*	*	*
Speak confidently, audibly and effectively, including through: working effectively in groups of different sizes and taking on required roles, including leading and managing discussions, involving others productively, reviewing and summarising, and contributing to meeting goals/deadlines		*			*	*	*
Speak confidently, audibly and effectively, including through: listening to and building on the contributions of others, asking questions to clarify and inform, and challenging courteously when necessary	*	*	*	*	*	*	*
Speak confidently, audibly and effectively, including through: listening and responding in a variety of different contexts, both formal and informal, and evaluating content, viewpoints, evidence and aspects of presentation	*	*	*	*	*	*	*

### Physical Education

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Take part in further outdoor and adventurous activities in a range of environments which present intellectual and physical challenges, and which encourage pupils to work in a team, building on trust and developing skills to solve problems, either individually or as a group		*			*	*	*