

Year 8 Curriculum – 2021-22

	Autumn Term		Spring Term		Summer Term	
	1	2	1	2	1	2
Key Concepts	Organisms		Ecosystems		Genes	
National Curriculum Knowledge & Understanding	<p>Gas exchange systems</p> <ul style="list-style-type: none"> * The structure and functions of the gas exchange system in humans, including adaptations to function * The mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume * The impact of exercise, asthma and smoking on the human gas exchange system * The effects of recreational drugs (including 	<p>Nutrition and digestion</p> <ul style="list-style-type: none"> * Content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed * Calculations of energy requirements in a healthy daily diet * The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases * The tissues and organs of the human digestive system, including adaptations to 	<p>Cellular respiration</p> <ul style="list-style-type: none"> * Aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life * A word summary for aerobic respiration * The process of anaerobic respiration in humans and micro-organisms, including fermentation, and a word summary for anaerobic respiration 	<p>Photosynthesis</p> <ul style="list-style-type: none"> * The reactants in, and products of, photosynthesis, and a word summary for photosynthesis The dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere * The adaptations of leaves for photosynthesis. 	<p>Inheritance</p> <ul style="list-style-type: none"> * Heredity as the process by which genetic information is transmitted from one generation to the next * The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection * Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce. 	<p>Genes</p> <ul style="list-style-type: none"> * A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model * The importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.

	substance misuse) on behaviour, health and life processes.	function and how the digestive system digests food (enzymes simply as biological catalysts) * The importance of bacteria in the human digestive system	* The differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism	* The role of leaf stomata in gas exchange in plants. * Plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots		
Assessment	End of Unit Assessment	End of Unit Assessment Badger Assessment End of term Summative Assessment	End of Unit Assessment Badger Assessment	End of Unit Assessment Badger Assessment End of term Summative Assessment	End of Unit Assessment Badger Assessment	End of Unit Assessment Badger Assessment End of term Summative Assessment

Why this? Why now?	This topic is conveyed early in the year as it incorporates several themes from year 7, from Cells and Organisms, where pupils define tissues, organs and systems and from reproduction where they have looked at the effects of lifestyle choices on a foetus. This is now stepped up to incorporate how these lifestyle factors impact on life processes such as gas exchange. The early use of the pressure model to introduce the physical concept of pressure will act as an introducer to more detailed study of pressure that will follow on later in the physics scheme of learning.	Nutrition and digestion systems will develop chained learning to form linked sequences across the curriculum, which is why it is studied at this point. It begins at KS2 where pupils describe the ways in which nutrients transported within humans whereas now, they will learn the purpose of these nutrients and the constituents of a balanced diet. This links back to the earlier topic in year 8 when pupils studied lifestyle choices. It also makes connections back to Cells and Organisms as reinforcement of tissues and organs. It also will lay foundations as to the origin of food	In the previous module pupils considered food as a chemical energy store. Now they will study the processes whereby this energy is released. It will incorporate aspects of the topic Gas Exchange Systems as pupils need to have prior understanding as to where and how oxygen is transported into the blood and Particle Model linking in diffusion and conservation of material. Pupils have already been introduced to word equations in Year 7 during Metals and non-metal topic allowing pupils to identify reactants and products of respiration and the construction of the equation.	This unit of work builds on earlier concepts from Cellular Respiration as it explains how plants obtain glucose for respiration. Prior to this it encompasses aspects of Gas Exchange systems studied at the beginning of the year. It is also studied before the chemistry unit of Climate so pupils understand the principles behind aspects of the carbon cycle. Furthermore, links will be forged in terms of human impact in the environment as pupils will have background knowledge as to why plants are fundamental to the maintenance of the atmosphere.	Following on from KS2 where pupils identified how animals and plants are adapted to suit their environment and that adaptation may lead to evolution, and in year 7, whereby the mechanism of inheritance takes place in the Reproduction module. This topic also relies on understanding of disruption to food webs studied in the Relationships in Ecosystems module. Pupils now have studied the underlying principles to build on more abstract ideas such as how extinction may occur in some species but not all. This is ideally placed before the Genes topic, where	The science in this final module draws on understanding from the previous Cells and Organisation module early in year 7, where pupils studied chromosomes, the Inheritance module later on in year 7 as the process by which genetic information is transmitted from one generation to the next was determined and finally in year 8, in the Inheritance module where the consequences of variation were studied. Cross curricular links from early in the year 8 Chemistry module Atoms, elements and Compounds can be interwoven as pupils will have an understanding
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	<p>This must be studied prior to Photosynthesis so pupils can conceptualise those plants do not breathe but have organs for gas exchange, enabling the study of Cellular respiration and Photosynthesis.</p>	<p>being chemical energy in the year 7 Physics topic of Energy, pupils have compared energy values from food labels, but now they will make calculations and link results back to lifestyle choices. The principles of enzymes will also be introduced in a simple form so that in year 9 pupils can study further aspects of enzymes such as how they are used in food production in the module Biotechnology.</p>			<p>pupils will discover why gene banks are necessary.</p>	<p>of polymers, which can be linked to the structure of DNA.</p>
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Skills & Characteristics	<p>Listening Pupils will have opportunities to develop their listening skills throughout the academic year, specifically when being given instructions for investigative work for e.g enzymes and digestion. They will also listen to each other throughout group work and opportunities for presenting their work.</p> <p>Problem Solving Pupils will use problem solving skills when evaluating the results from investigative processes. They will work collaboratively to explain the results of their practical experiments using scientific reasoning.</p> <p>Aiming High All pupils will set clear, tangible goals and which can especially be met during investigative work when following methods and use of level ladders in tasks.</p> <p>Teamwork: Pupils will be required to work in a group whilst carrying out practical work or problem-solving activities showing that these skills are necessary in the world of work irrespective of career choice.</p>						
Aspirations & Careers	<table border="1"> <tr> <td data-bbox="76 632 601 1011"> The science involved in this area correlates with:- * Health care * Social work * Asthma nurse </td><td data-bbox="601 632 902 1011"> The science involved in this area correlates with:- * Food technologist * Nutritionist * Personal trainer </td><td data-bbox="902 632 1203 1011"> The science involved in this area correlates with:- * Personal trainer * Food technology * Microbiologist </td><td data-bbox="1203 632 1504 1011"> The science involved in this area correlates with:- * Research scientist * School teacher </td><td data-bbox="1504 632 1805 1011"> The science involved in this area correlates with:- * Geneticist * Genetics counsellor * Plant breeder </td><td data-bbox="1805 632 2171 1011"> The science involved in this area correlates with:- * Zoologist * Biochemist * Archaeologist </td></tr> </table>	The science involved in this area correlates with:- * Health care * Social work * Asthma nurse	The science involved in this area correlates with:- * Food technologist * Nutritionist * Personal trainer	The science involved in this area correlates with:- * Personal trainer * Food technology * Microbiologist	The science involved in this area correlates with:- * Research scientist * School teacher	The science involved in this area correlates with:- * Geneticist * Genetics counsellor * Plant breeder	The science involved in this area correlates with:- * Zoologist * Biochemist * Archaeologist
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Year Group	Basic (Lower Ability End Points)	Clear (Middle Ability End Points)	Detailed (Higher Ability End Points)
8	<p>Pupils use knowledge and understanding of organisms, their behaviour and the environment, such as the basic processes of respiration and breathing, to identify and state the changes that may occur in the body using basic scientific terminology. They use simple scientific ideas with evidence they have collected to give descriptions of their observations, linking cause and effect, for example increasing exercise will affect the rate of respiration and rate of breathing. Pupils will identify factors that can affect the health of the individual, such as drugs, alcohol and tobacco and state its effect. They recognise the purpose of a variety of scientific and technological developments in their everyday lives, for example the body needs a balanced diet with carbohydrates, lipids, proteins, vitamins, minerals, dietary fibre and water, for its maintenance.</p> <p>Working Scientifically Pupils respond to suggestions and put forward their own ideas about how to investigate an idea or find answers to questions. They recognise why it is important to collect data to investigate ideas and answer questions, and use texts to find information. They begin to recognise risks with help. They make relevant observations and measure quantities, such as length or mass, selecting and using a range of simple equipment. They carry out fair tests with some help, recognising and explaining what makes them fair. They record findings in a variety of ways, including tables or charts. They give explanations for observations and for patterns in measurements they have made and recorded. They communicate</p>	<p>Pupils describe some processes and phenomena related to organisms, their behaviour and the environment, drawing on scientific knowledge and understanding and using a range of scientific terminology. For example, during the basic processes of respiration and breathing, they will describe why the rate of would increase during exercise. They use more detailed scientific ideas with evidence they have collected to give explanations of their observations, linking cause and effect, for example increasing exercise will increase the rate of respiration, breathing and heart rate to supply more oxygen to cells. Pupils will be able to identify that drugs such as alcohol and tobacco affect the health of an individual and describe their effects on the body. They recognise and describe the purpose of a variety of scientific and technological developments in their everyday lives, for example probiotics are used to improve the digestive health of individuals and how biotechnology can secure food production.</p> <p>Working Scientifically Pupils decide on an appropriate approach, including using a fair test to answer a question, and select suitable equipment and information from that provided. They select and use methods that are adequate for the task. Following instructions, they take action to control obvious risks to themselves. They make a series of observations and measurements and vary one factor while keeping others the same. They record their observations, comparisons and measurements using tables and bar charts and begin to plot points to form simple graphs. They interpret data containing positive and negative numbers. They begin to relate their conclusions to patterns in data, including graphs, and to scientific knowledge and understanding. They communicate their</p>	<p>Pupils explain processes and phenomena related to organisms, their behaviour and the environment, drawing on abstract ideas and using a wide range of accurate terminology, for example the main functions animal organs such as those within the digestive system and how their adaptations and functions are essential. They explain processes and phenomena, in more than one step or using a model, such as model digestive system. They can explain changes in the body to account for the effects of exercise in the body and use secondary data to support their conclusions. Pupils will also explain how using drugs, such as alcohol and tobacco during pregnancy can affect the health of a foetus by using secondary data sources. They recognise and explain the purpose of a variety of scientific and technological developments in their everyday lives, for example probiotics are used to improve the digestive health of individuals and how biotechnology can secure food production. They describe applications and implications of science, such as solving some of the health problems that arise when organ damage occurs.</p> <p>Working Scientifically Pupils decide appropriate approaches to a range of tasks, including selecting sources of information and apparatus. They select and use methods to obtain data systematically. They recognise hazard symbols and make, and act on, simple suggestions to control obvious risks to themselves and others. They use line graphs to present data, interpret numerical data and draw conclusions from them. They analyse findings to draw scientific conclusions that are consistent with the evidence. They communicate these using scientific and mathematical conventions and terminology. They evaluate their working methods to make practical suggestions for improvements.</p>

in a scientific way what they have found out and suggest improvements in their work.

conclusions using appropriate scientific language. They suggest improvements in their work, giving reasons.