



Topic name	Term	Skills developed	Link to NC subject content	Prior learning	Next link in curriculum
Photosynthesis	Autumn (complete remaining topics from Year 7)	Scientific attitudes - Evaluate risks Experimental skills and investigations - Ask questions based on observations of the real world, alongside prior knowledge and experience - Make predictions using scientific knowledge and understanding - Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate - Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety - Make and record observations and measurements - Apply sampling techniques Analysis and evaluation - Present observations and data using appropriate methods, including tables and graphs - Explaining data in relation to predictions and hypotheses Measurement - Carry out appropriate calculations	Material cycles and energy Photosynthesis - 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 - the adaptations of leaves for photosynthesis Gas exchange systems - the role of leaf stomata in gas exchange in plants Nutrition and digestion - plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots Interactions and interdependencies Relationships in an ecosystem - the interdependence of organisms in an ecosystem – food chains & sampling techniques to estimate population size	Links from KS2: B3.1 PLANTS Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Investigate the way in which water is transported within plants Links to other KS3 topics: Cells, tissues and organs – plant cells	Y9 Cells & Microscopes Links to GCSE Topic: 4.4 Bioenergetics 4.4.1 Photosynthesis (taught in Y10) 4.7 Ecology 4.7.4 Organisation of an ecosystem - required practical 9 (taught in Y11)



Respiration, breathing & movement	Autumn/ Spring	Scientific attitudes - Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility Experimental skills and investigations - Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience - Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate - Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety - Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements Analysis and evaluation - Apply mathematical concepts and calculate results - Present observations and data using appropriate methods, including tables and graphs - Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions	Nutrition and digestion - 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 Cellular respiration - 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 - the differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism Gas exchange systems - 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 skeletal and muscular systems - the structure and functions of the human skeleton, to include support, protection, movement and making blood cells	Links from KS2: ANIMALS including HUMANS Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Links to other KS3 topics: Cells, tissues and organs (digestive system – taught in Y7)	Links to GCSE Topic: 4.1.3 Transport in cells 4.1.3.1 Diffusion (lungs as a gas exchange surface – taught in Y10) 4.4 Bioenergetics 4.4.2 Respiration (taught in Y10)
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		• Present reasoned explanations, including explaining data Measurement • Understand and use SI units • Use and derive simple equations and carry out appropriate calculations	• biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles • the function of muscles and examples of antagonistic muscles.		
Ecosystems	Summer	Scientific attitudes • Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility when collecting ecological data. • Recognise the importance of sampling techniques and representative data when studying ecosystems. Experimental skills and investigations • Ask questions and develop a line of enquiry based on observations of habitats, organisms and environmental factors.	Relationships in an ecosystem • interdependence of organisms in an ecosystem, including food webs and insect pollinated crops • the importance of plant reproduction through insect pollination in human food security • how organisms affect, and are affected by, their environment, including the accumulation of toxic materials Nutrition and food chains	Links from KS2: Living things and their habitats Animals including humans Plants Links to other KS3 topics: Cells, tissues and organs (digestive system – taught in Y7)	Links to GCSE Topics 4.7 Ecology



	• Select, plan and carry out appropriate ecological enquiries, including identifying independent, dependent and control variables where appropriate. • Use appropriate techniques, apparatus and materials during fieldwork and laboratory work, paying attention to health and safety. • Use sampling techniques such as quadrats and transects to investigate the distribution and abundance of organisms. • Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements. Analysis and evaluation • Apply mathematical concepts to ecological data, including calculating averages, percentages and population estimates. • Present observations and data using appropriate methods, including tables, bar charts, line graphs and food webs. • Interpret observations and data, including identifying patterns in the distribution of organisms and relationships between environmental factors and populations. • Present reasoned explanations, including explaining how organisms interact with each other and their environment. • Evaluate evidence relating to biodiversity, environmental change and	• 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 interdependence of organisms in food chains and food webs, including producers, consumers and decomposers • the transfer of energy between trophic levels Biodiversity and ecosystems • the variation between species and between individuals of the same species • biodiversity and the importance of maintaining biodiversity for ecosystem stability and human wellbeing • the role of microorganisms in decomposition and nutrient cycling Earth and environmental systems • the composition of the atmosphere and the impact of human activity on atmospheric carbon dioxide levels	
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		conservation. Measurement • Understand and use SI units when recording ecological measurements. • Measure and record environmental variables such as temperature, light intensity, soil pH and moisture. • Use and derive simple equations and carry out appropriate calculations, including percentage change and population estimates where appropriate.	• the production of carbon dioxide by human activity and the impact on climate • the role of plants and microorganisms in the carbon cycle Human impacts and sustainability • the effects of human activity on ecosystems, including habitat destruction, pollution and climate change • the importance of conservation and sustainable management of natural resources • strategies to maintain biodiversity and reduce environmental impact Working Scientifically within the Ecosystems unit • use of sampling techniques such as quadrats and transects to investigate the distribution and abundance of organisms • collecting, presenting and analysing ecological data using tables, charts and graphs • identifying patterns and relationships between organisms and environmental factors • evaluating methods and considering the reliability and validity of ecological investigations	
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West Kirby
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Curriculum Map – Year 8 – Biology (2026-27)

