

Topic	1. Exercise and health	2. Diet and digestion	3. Ecology and photosynthesis
Unit			
Skills	<ul style="list-style-type: none"> Name and use a wide range of scientific apparatus. Follow simple risk assessments. Can plan an investigation that will answer a question. Know what the word “variables” means. Can take measurements using a range of scientific equipment. 	<ul style="list-style-type: none"> Can take measurements using a range of scientific equipment. Understand potential causes of random and systematic errors when collecting data. Can record data in tables. Can record data in bar charts. 	<ul style="list-style-type: none"> Take measurements using a range of scientific equipment. Record data in tables and bar charts. Record data as a line graph on axis. Describe patterns shown by data. Spot anomalies Calculate averages and differences
Knowledge	<ul style="list-style-type: none"> The structure and functions of the human skeleton The interaction between skeleton and muscles. The function of muscles and examples of antagonistic muscles. The structure and functions of the gas exchange system in humans. The mechanism of breathing to move air in and out of the lungs. The impact of exercise, asthma and smoking on the human gas exchange system 	<ul style="list-style-type: none"> The content of a healthy human diet, and why each component is needed. The consequences of imbalances in the diet. The tissues and organs of the human digestive system. The importance of bacteria in the human digestive system 	<ul style="list-style-type: none"> The reactants in, and products of, photosynthesis, and a word summary for photosynthesis The adaptations of leaves for photosynthesis. The interdependence of organisms in an ecosystem. The importance of plant reproduction through insect pollination. How organisms affect, and are affected by, their environments.
Anchor	From Year 6 <ul style="list-style-type: none"> human circulatory system functions of the heart, blood vessels and blood 	From Year 6 <ul style="list-style-type: none"> Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function 	From Year 6 Life process of reproduction in some plants and animals.
Assessment	Self assessed differentiated plenary every lesson Assessment weeks – recall test based on year 6 and year 7 content Educake Homework set every month		
Values	Through our teaching of investigations and use of CLEAPSS <ul style="list-style-type: none"> how to recognise and follow health and safety procedures Through our departmental feedback and marking policy <ul style="list-style-type: none"> to make effective use of constructive feedback to evaluate their own personal strengths and areas for development and to use this to inform goal setting https://www.pshe-association.org.uk/		

Topic	1. <u>Communicable diseases</u>	2. <u>Ecology and photosynthesis</u>	3. <u>Inheritance and selection</u>
Unit	Infection and response	Ecology and Photosynthesis	Genetics and Evolution
Skills	<ul style="list-style-type: none"> • Select measuring equipment based on precision and resolution. • Evaluate the risks that are linked to different experiments. • Identify dependent and independent variables. • Understand the purpose of a “control” experiment. • Make predictions that are supported by scientific facts. 	<ul style="list-style-type: none"> • Take measurements using a range of scientific equipment. • Record data in tables and bar charts. • Record data as a line graph on axis. • Describe patterns shown by data. • Spot anomalies • Calculate averages and differences 	<ul style="list-style-type: none"> • Correctly construct line graphs. • Link anomalies to specific random and systematic errors • Calculate percentages. • Present explanations for patterns in data • Suggest how the accuracy and precision of data can be improved.
Knowledge	<ul style="list-style-type: none"> • Pathogens are microorganisms such as viruses and bacteria that cause infectious diseases • They frequently produce toxins that damage tissues and make us feel ill. • Antibiotics, such as penicillin, are medicines that help to cure bacterial disease by killing infective bacteria inside the body • New medical drugs have to be tested and trialled before being used to check that they are safe and effective. 	<ul style="list-style-type: none"> • The reactants in, and products of, photosynthesis, and a word summary for photosynthesis • The adaptations of leaves for photosynthesis. • The interdependence of organisms in an ecosystem. • The importance of plant reproduction through insect pollination. • How organisms affect, and are affected by, their environments. 	<ul style="list-style-type: none"> • The process by which genetic information is transmitted from one generation to the next • Chromosomes, genes and DNA, and the role played by Watson, Crick, Wilkins and Franklin in the development of the DNA model • Differences between species • Variation between individuals within a species can be continuous or discontinuous. • How variation between species and between individuals of the same species drives natural selection • How changes in the environment affects species and may lead to extinction • Biodiversity and the use of gene banks.
Anchor	From Y7 Exercise and Health	From Year 6 Life process of reproduction in some plants and animals.	From Y6 recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents □ identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
Assessment	Self assessed differentiated plenary every lesson Assessment weeks – recall test based on y6, y7 (and y8) content Educake Homework set every month		
Values	Through our teaching of investigations and use of CLEAPSS: <ul style="list-style-type: none"> • how to recognise and follow health and safety procedures • Through our departmental feedback and marking policy • to make effective use of constructive feedback • to evaluate their own personal strengths and areas for development and to use this to inform goal setting • https://www.pshe-association.org.uk/ 		

Topic	1. <u>Looking at cells</u>	2. <u>Digestion and circulation</u>	3. <u>Communicable diseases</u>	4. <u>Respiration</u>	5. <u>Transport between cells</u>	6. <u>Organ systems in plants</u>	7. <u>Plant defences</u>
Unit	B1 – Cell structure	B2 – Organisation	B3 – Infection and response	B4 – Bioenergetics	B1 – Cell structure	B2 – Organisation	B3 – Infection and response
Skills	<ul style="list-style-type: none"> Identify the main hazards in a practical context. Record measurements appropriately. Use an appropriate number of significant figures. Substitute numerical values into algebraic equations. Make order of magnitude calculations. Construct diagrams. Recognise or describe patterns and trends in data. 	<ul style="list-style-type: none"> Identify the main hazards in a practical context. Record measurements appropriately. Construct tables. Recognise and describe trends in data. Draw conclusions. 	<ul style="list-style-type: none"> Find the arithmetic mean in a set of data. Translate data between graphical and numeric form. Make order of magnitude calculations. Recognise or describe trends in data. Draw conclusions from given observations 	<ul style="list-style-type: none"> Describe a practical procedure for a specified purpose. Identify the dependent and independent variables in a given context. Identify the main hazards in a practical context. Record measurements appropriately. Find the arithmetic mean of a set of data. Plot 2 variables from experimental or other data. Recognise or describe patterns or trends in data. Draw conclusions from given data. 	<ul style="list-style-type: none"> Record measurements appropriately. Find the arithmetic mean of data. Plot two variables from experimental or other data. Use the appropriate SI units for quantities. Draw conclusions from data. 	<ul style="list-style-type: none"> Read measurements off a scale in a practical context. Describe a practical procedure for a specified purpose. Translate data between graphical and numerical form. Draw conclusions from given observations 	<ul style="list-style-type: none"> Translate data between graphical and numerical form. Draw conclusions from given observations
Knowledge	<ul style="list-style-type: none"> Eukaryotic and prokaryotic cell structures and specialisation, microscopy. Culturing microbes Microscopes Required Practical Culturing Microbes Required Practical 	<ul style="list-style-type: none"> The human digestive and circulatory systems. The effect of diet and lifestyle on health. Cancer Food Tests Required Practical Enzymes Required Practical 	<ul style="list-style-type: none"> Communicable diseases caused by fungi, protists, bacteria and viruses. The human immune system, including monoclonal antibodies. Vaccinations, antibiotics and painkillers. The discovery and development of drugs. 	<ul style="list-style-type: none"> Aerobic and anaerobic respiration. How the body responds to exercise. The role of metabolism. 	<ul style="list-style-type: none"> The processes of osmosis, diffusion and active transport. Including when, why and how they occur. Osmosis Required Practical 	<ul style="list-style-type: none"> Plant tissues and organ systems. Including the structure and adaptations of leaves, the xylem and phloem. Factors that will affect the rate of transpiration 	<ul style="list-style-type: none"> Plant defences and responses
Anchor	Cells and microscopes in Y8	Healthy diet in Y7	Pathogens and disease in Y8	Exercise and the body in Y7	From Y7 Exercise and Health	Pollination and photosynthesis in Y8 The term "system" (in reference to digestive system and immune system) in Y9	Pathogen in Y8 Human defence systems and pathogens in Y9
Assessment	Self assessed differentiated plenary every lesson Assessment weeks – recall test based on y7, y8 and y9 content Educake HWK set every month						
Values	Through our teaching of investigations and use of CLEAPSS - how to recognise and follow health and safety procedures Through our departmental feedback and marking policy to make effective use of constructive feedback to evaluate their own personal strengths and areas for development and to use this to inform goal setting https://www.pshe-association.org.uk/						

Topic	1. The nervous system	2. Cell division	3. Gametes and reproduction	4. Photosynthesis	5. Environmental cycles	6. Plant hormones
Unit				B4 - Bioenergetics	B7 – Ecology	
Skills	<ul style="list-style-type: none"> Suggest and describe an appropriate sampling technique in a given context. Explain the need to manipulate and control variables. Assess whether sufficient measurements have been taken in an experiment. Calculate uncertainty of data and understand what it means. Comment on the extent to which data is consistent with a given hypothesis. Understand that any anomalous values should be examined to try to identify the cause and, if a product of a poor measurement, ignored. Understand that measurements are affected by random error due to results varying in unpredictable ways. Understand that systematic error is due to results differing from the true value by a consistent amount each time. Understand that measurements are precise if they cluster closely. Understand that an accurate measurement is one that is close to the true value. 	<ul style="list-style-type: none"> FROM Y9 Make order of magnitude calculations. Draw conclusions from given observations. 	<ul style="list-style-type: none"> Explain the need to manipulate and control variables. Assess whether sufficient measurements have been taken in an experiment. 	<ul style="list-style-type: none"> Select the apparatus to be used for a specific technique or purpose. Suggest and describe an appropriate sampling technique in a given context. Explain the need to manipulate and control variables. Calculate uncertainty of data and understand what it means. Use data to make predictions. Identify which of two or more hypotheses provides a better explanation of data in a given context. Understand that any anomalous values should be examined to try to identify the cause and, if a product of a poor measurement, ignored. Understand that measurements are affected by random error due to results varying in unpredictable ways. Understand that systematic error is due to results differing from the true value by a consistent amount each time. 	<ul style="list-style-type: none"> Suggest and describe an appropriate sampling technique in a given context. Explain the need to manipulate and control variables. Assess whether sufficient measurements have been taken in an experiment. Use data to make predictions. Comment on the extent to which data is consistent with a given hypothesis. Understand that any anomalous values should be examined to try to identify the cause and, if a product of a poor measurement, ignored. Understand that measurements are affected by random error due to results varying in unpredictable ways. Understand that systematic error is due to results differing from the true value by a consistent amount each time. Understand that measurements are precise if they cluster closely. 	<ul style="list-style-type: none"> Explain the need to manipulate and control variables. Assess whether sufficient measurements have been taken in an experiment. Understand that any anomalous values should be examined to try to identify the cause and, if a product of a poor measurement, ignored. Understand that an accurate measurement is one that is close to the true value.
Knowledge	<ul style="list-style-type: none"> Homeostasis The human nervous system Structure and function The brain (biology only) The eye (biology only) Control of body temperature (biology only) Reaction Time Required Practical 	<ul style="list-style-type: none"> Mitosis and the cell cycle Stem cells 	<ul style="list-style-type: none"> Sexual and asexual reproduction Meiosis Advantages and disadvantages of sexual and asexual reproduction (biology only) DNA and the genome DNA structure (biology only) 	<ul style="list-style-type: none"> Photosynthetic reaction Rate of photosynthesis Uses of glucose from photosynthesis 	<ul style="list-style-type: none"> How materials are recycled Decomposition (biology only) Impact of environmental change (biology only) (HT only) Land use and Deforestation Global warming Maintaining biodiversity Biodiversity Waste management Decay Required Practical (biology only) 	<ul style="list-style-type: none"> Plant Hormones (biology only) Coordination and control (biology only) Germination Required Practical (biology only)
Anchor	Y9 – Body's response to exercise	Y9 – cell structures and culturing microbes (binary fission) Y8 – cell structure	Y10 – mitosis Y9 – Cell structure Y8 – genetics, chromosomes, DNA	Y9 – Plant tissue structure Y8 – plant cell structure Y7 - Photosynthesis	Y10 – Photosynthesis Y9 – Plant tissue structure Y8 Chemistry – sustainability	Y10 – coordination in humans (nervous system), photosynthesis Y9 – Plant tissue structure, osmosis, active transport, diffusion Y7 – pollination and plant reproduction
Assessment	RECALL QUIZZES ORGANISATION IN ANIMALS (FROM Y9) ENDOCRINE SYSTEM NERVOUS SYSTEM THE BRAIN AND EYE THERMOREGULATION AND OSMOREGULATION	RECALL QUIZZES CELL STRUCTURE AND FUNCTION (FROM Y9) STEM CELLS SPECIALISED CELLS CELL DIVISION	RECALL QUIZZES REPRODUCTION GENETICS DNA	RECALL QUIZZES ORGANISATION IN PLANTS (FROM Y9) BIOENERGETICS (INCLUDING RESPIRATION FROM Y9)	RECALL QUIZZES CYCLES BIODIVERSITY	RECALL QUIZZES ENDOCRINE SYSTEM (FROM Y9) PLANT HORMONES
Values	<i>Homeostasis, Eyes, Problems with eyes</i>		<i>Reproduction, Sexual selection, Selective breeding, DNA, DNA Sequencing</i>			

Topic	1. <u>Ecology</u>	2. <u>Endocrinology</u>	3. <u>Inheritance</u>	4. <u>Variation</u>	5. <u>Ecosystems</u>	6. <u>Evolution</u>
Unit				B4 - Bioenergetics	B7 – Ecology	
Skills	<ul style="list-style-type: none"> Select and justify the apparatus to be used for a specific technique or purpose. Apply understanding of apparatus and techniques to suggest a procedure. Explain why a given practical procedure is well designed for its specified purpose. Assess the precision of measurements taken in an experiment. Understand that measurements are repeatable when repetition, under the same conditions by the same investigator, gives similar results. Understand that measurements are reproducible if similar results are obtained by different investigators with different equipment. 	<ul style="list-style-type: none"> Assess the precision of measurements taken in an experiment. Draw and use the slope of a tangent to a curve as a measure of rate of change. Understand that measurements are reproducible if similar results are obtained by different investigators with different equipment. 	<ul style="list-style-type: none"> Explain why a given practical procedure is well designed for its specified purpose. 	<ul style="list-style-type: none"> Explain why a given practical procedure is well designed for its specified purpose. Assess the precision of measurements taken in an experiment. Understand that measurements are reproducible if similar results are obtained by different investigators with different equipment. 	<ul style="list-style-type: none"> Assess the precision of measurements taken in an experiment. Draw and use the slope of a tangent to a curve as a measure of rate of change. 	<ul style="list-style-type: none"> Assess the precision of measurements taken in an experiment. Draw and use the slope of a tangent to a curve as a measure of rate of change. Understand the physical significance of area between a curve and the x-axis and measure it by counting squares as appropriate. Understand that measurements are repeatable when repetition, under the same conditions by the same investigator, gives similar results. Understand that measurements are reproducible if similar results are obtained by different investigators with different equipment.
Knowledge	<ul style="list-style-type: none"> Communities Abiotic factors Biotic factors Adaptations Estimating Population sizes Required Practical 	<ul style="list-style-type: none"> Human endocrine system Control of blood glucose concentration Maintaining water and nitrogen balance in the body (biology only) Hormones in human reproduction Contraception The use of hormones to treat infertility (HT only) Negative feedback (HT only) 	<ul style="list-style-type: none"> Genetic inheritance Inherited disorders Sex determination 	<ul style="list-style-type: none"> Variation Classification of living organisms Selective breeding Genetic engineering Cloning (biology only) 	<ul style="list-style-type: none"> Organisation of an ecosystem and Trophic levels Pyramids of biomass and Transfer of biomass Factors affecting food security including : <ul style="list-style-type: none"> Farming techniques Sustainable fisheries Role of biotechnology 	<ul style="list-style-type: none"> Evolution Theory of evolution (biology only) Speciation (biology only) The understanding of genetics (biology only) Evidence for evolution Fossils Extinction Resistant bacteria
Anchor	Y10 – Biodiversity Y9 – Plant responses	Y10 – plant hormones, human nervous system Y9 – diffusion, osmosis, active transport Y8 – inheritance and variation	Y10 – Mitosis and Meiosis, DNA and genetic material Y8 – inheritance and variation	Y11 – Communities, inheritance Y10 – DNA and genetic material Y8 – inheritance and variation	Y11 – Communities and ecological studies. Variation, DNA and genetic material. Y10 – Maintaining biodiversity Y8 Chemistry - sustainability	Y11 – Genetic inheritance, DNA and genetic material Y10 – Mitosis and meiosis Y8 - inheritance and variation
Assessment	RECALL QUIZZES PLANT HORMONES (Y9) BIODIVERSITY (Y10) ADAPTATION AND ORGANISATION	RECALL QUIZZES ORGANISATION IN ANIMALS (Y9) TRANSPORT ACROSS MEMBRANES (Y9) ENDOCRINE SYSTEM	RECALL QUIZZES NON-COMMUNICABLE DISEASES (Y9) CELL DIVISION (Y10) GENETICS (Y10) DNA (Y10)	RECALL QUIZZES INHERITANCE AND CLASSIFICATION CLONING GENETICS (Y10)	RECALL QUIZZES ADAPTATION AND ORGANISATION (Y10) BIODIVERSITY (Y10) FOOD PRODUCTION AND FARMING	RECALL QUIZZES CELL DIVISION (Y10) VARIATION AND EVOLUTION EVOLUTION THEORIES
Values		IVF Contraceptives Reproduction	<i>Selective breeding</i> <i>Sexual selection</i>	Genetic engineering		Cultural evolution Extinction Extremophile