Year Group	Y7 Biology					
Term	1	2	3	4	5	6
Topic Title	B1 Observing cells	Structure & function of body systems		Animal development		Plant reproduction
Rationale	Understanding what cells do, their requirements, and their specialisation into tissues and organs, helps pupils to understand why complex living organisms are the way they are. It enables them to make greater sense of the organ systems and life processes that they study in some detail at Key Stage 3.	The hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms. The structure and functions of the gas exchange system in humans, including adaptations to function. The structure and functions of the human skeleton, to include support, protection, movement, and making blood cells. This is a sensible format for progression to build upon knowledge.		Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive cells and organ system. Follows logically on from a developing knowledge of cells and organ systems so this topic is placed here. Y7 students will have studied Life cycles, so this topic builds upon this concept with the human life cycle for foetal development and birth.		Plant reproduction topic involves plant structures / organ systems for reproduction and the understanding that pollen is the male gametic cell for plant reproduction as compared to a sperm cell. To include forms of pollination and methods of seed dispersal.
Prior knowledge	Year 6 pupils will have some understanding of life processes & they will also have been taught about micro-organisms and should have some idea that these are too small to be seen easily. Their understanding of just how small that might be is likely to be limited.	Year 3 science: Animals, including humans, focusing on skeletons and muscles.		Year 6 pupils will have some understanding of life processes, such as growth and reproduction, having studied in Y5: Living things including life cycles of a mammal, amphibian, insect and bird. Animals, including humans, focusing on changes from birth to old age.		Year 3 Science covers: Plants, including parts of plants, needs of plants and their life cycle.
Key knowledge/skills development	Cells as the fundamental unit of living organisms, including how to observe, interpret, and record cell structure using a light microscope. Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety. Observing cells, Plant and animal cells, Specialised cells, Movement of substances, Unicellular organisms.	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 structure and functions of the human skeleton, to include support, protection, movement, and making blood cells. 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. Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions. Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements.		Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, gametes, and fertilisation. Gestation and birth, and the effect of maternal lifestyle on the foetus through the placenta. Reproduction in humans (as an example of a mammal), menstrual cycle (without details of hormones).		Reproduction in plants including flower structure, wind and insect pollination, fertilisation, including quantitative investigation of some dispersal mechanisms. reproduction through insect pollination in human food security.
National Curriculum/specification links	B1 1.1-1.5 Observing cells: Structure and function of living organisms: B1 2.1 Levels of organisation.	B1 2.2 - 2.6 Gas exchange; Breathing; Skeleton; Movement: joints; Movement: muscles		Structure and function of living organisms: Growth & Reproduction: B1 3.1 Adolescence; B1 3.2 Reproductive systems; B1 3.3 Fertilisation and implantation; B1 3.4 Development of a fetus; B1 3.5 The menstrual cycle		The importance of plants: B1 3.6 Flowers and pollination; B1 3.7 Fertilisation and germination; B1 3.8 Seed dispersal.
Additional Literacy Opportunities	Cells H/W DART Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks	Understanding Circulation Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks	Reproduction DART Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks	Reproduction DART Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks		Pollination DART Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks
Additional Numeracy Opportunities	Using simple formula to calculate total magnification	Scale factors / order to structures.		Period: meaning of word in maths & science. Students use mumeracy in looking at menstrual cycle & gestation periods.		
STEM / WS	In the Lab Unit; WS unit; Asking scientific Q's; Planning 7 recording data skills.	Complete WS unit: Analysing data; Evaluating data; Scientific investigation. Writing a conclusion. Crest Awards begin	Crest Awards Bronze	Bio Investigation	Chem Investigation	Phys Investigation
Cross curricular links		Maths: continuous / discontinuous data (discrete / categoric); PE: Respiration & breathing; Physics: pressure		(PSHE) sex education; Child Development: Human reproduction, gestation & birth		Food technology: fruit / seeds. Biology Y8 Health & digestion
Key vocabulary	Cell Unicellular Multicellular Tissue Organ Diffusion Structural Adaptations Cell membrane Nucleus Vacuole Mitochondria Cell wall Chloroplast Cytoplasm Immune system Reproductive system Digestive system Circulatory system Respiratory system Muscular-skeletal system	Joints Breathing Trachea Bronchi Bronchioles Alveoli Ribs Diaphragm Lung volume Bone marrow Ligaments Tendons Cartilage Antagonistic muscle pair		Gamete Fertilisation Ovary Testicle Oviduct Uterus Ovulation Menstruation Reproductive system Penis Vagina Foetus Gestation Placenta Amniotic fluid Umbilical cord		Pollen Ovules Pollination Fertilisation Seed Inheritance Fruit, Carpel, stigma style filament ovum (egg cell) petal sepal nectar insect pollination wind pollination germination, seed dispersal

Year 8 Biology						
Term	1	2	3	4	5	6
Topic Title	**Health & Lifestyle**		**Ecosystem Processes I**	**Ecosystem Processes II**	**Adaptation & Inheritance I**	**Adaptation & Inheritance II**
Rationale	During Year 7 the pupils have developed their knowledge of body systems, cells, specialised cells and unicellular organisms, which is essnetial prior knowledge to understand the effects of health and lifestyle on the body and and its systems.		Prior knowledge of the processes of reproduction in plants is helpful to understanding functions of the different parts of plants. The pupils have also previously studied gas exchange and breathing during Year 7 which is importatn rerieval knowledge to study respiration.		To cover this module pupils must have completed the cells content and have a knowledge of the life processes they need to survive. Prior knowledge of the role of photosynthesis in plants, feeding, reproduction. This must be taught towards the end of the Key Stage as a result.	
Prior knowledge	Year 3: Pupils should be taught to: ▯ 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. Year 4: Pupils should be taught to: ▯ describe the simple functions of the basic parts of the digestive system in humans ▯ identify the different types of teeth in humans and their simple functions ▯ construct and interpret a variety of food chains, identifying producers, predators and prey		Y5/6 Students are taught that plants use sunlight & water to grow and this is true of our food supply.	Relevance to food chains & webs : interdependence.Year 5: Pupils should be taught to: ▯ describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird ▯ describe the life process of reproduction in some plants and animals.Year 6: Pupils should be taught to: ▯ describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals ▯ give reasons for classifying plants and animals based on specific characteristics.	Year 6: Pupils should be taught to: ▯ describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals ▯ give reasons for classifying plants and animals based on specific characteristics.	Year 6: Pupils should be taught to: recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago ▯ 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.
Key knowledge/skills development	**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 ▯ 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 function and how the digestive system digests food (enzymes simply as biological catalysts). ▯ the importance of bacteria in the human digestive system**Health** ▯ the effects of recreational drugs (including nicotine (including substance misuse) on behaviour, health and life processes.		**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 and to maintain levels of oxygen and carbon dioxide in the atmosphere ▯ the adaptations of leaves for photosynthesis.	**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 is terms of the reactants, the products formed and the implications for the organism. **Relationships in an ecosystem** ▯ the 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,	**Inheritance, chromosomes, DNA and genes** ▯ heredity as the process by which genetic information is transmitted from one generation to the next ▯ 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 ▯ differences between species ▯ the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation ▯ 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, which in turn may lead to extinction ▯ the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.	
National Curriculum/specification links	B2: 1.1-1.5	B2: 1.6-1.9	B2 2.5-2.9	B2 2.1-2.5	B2: 3.1-3.4	B2: 3.5-3.7
Additional Literacy Opportunities	Bones DART Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks	Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks	Photosynthesis Literacy H/W task Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks	Respiration Literacy H/W Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks	Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks	Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks
Additional Numeracy Opportunities	Calculating Energy content in foods / energy requirements in diets		Graphs of factors affecting photosynthesis	Rates of respiration Graphs to read / analyse		
STEM / WS	In the Lab Unit; WS unit; Asking scientific Q's; Planning 7 recording data skills.	Complete WS unit: Analysing data; Evaluating data; Scientific investigation. Writing a conclusion. Crest Awards begin	Crest Awards Bronze	Bio Investigation	Chem Investigation	Phys Investigation
Cross curricular links	Health and Lifestyle (balanced diet/alcohol/smoking) - Idependent research, referencing. Impacts of poor diet/lifestyle on health **LINK: (Y7 Tech Term 4; Y9 Term 2,3)) (Y7 French Term 6) (Y8 German Term 5)**	Ecosystems 1 (Photosynthesis and Respiration) - Accurate and precise data, repeatability and reproducubility **LINK: (Y7 Geog Term 5; Y7 Term 2)**	Ecosystems 1 (Photosynthesis and Respiration) - Accurate and precise data, repeatability and reproducubility **LINK: (Y7 Geog Term 5; Y7 Term 2)**	Ecosystems 2 (Food chains/webs/adaptations, distruption to food chains inc pollution and bioaccumulation) - Range of data, selecting equipment **LINK: (Y7 Geog Term 5; Y7 Term 2)**	B8T4 Adaptations and Inheritance 1 (DNA/Genes/Alleles, inheritance, aquired charecteristics) - Graph selection, recognising outliers, significant figures **LINK: (Y8 RE Term6)**	B8T5 Adaptations and Inheritance (Variation and Natural selection, Causes of extinction, Charles Darwin) - Mean/Mode/Median, Range of data **LINK: (Y8 RE Term6)**
Key vocabulary	nutrient, carbohydrate, lipids, protein, vitamin, mineral, mineral, fibre, balanced diet, food test, hypothesis, malnourishment, starvation, obese, deficiency, digestive system, digestion, gullet, stomach, small intestine, large intestine, rectum, anus, villi, enzyme, catalyst, carbohydrase, protease, lipase, bile, drug, recreational and medicinal drug , addiction, withdrawal symptoms, ethanol, depressant, alcoholic, unit of alcohol, passive smoking, stimulant		algae, producer, consumer, photosynthesis, chlorophyll, stomata, nitrates, potassium, magnesium, deficiency, fertiliser, chemosynthesis, aerobic respiration, plasma, haemoglobin	anaerobic respiration, oxygen debt, fermentation, food chain, predator, prey, food web, interdependence, population, bioaccumulation, ecosystem, community, habitat, co-exist, niche	competition, adaptation, interdependence, variation, species, inherited variation, environmental variation, discontinuous variation, continuous variation	DNA, chromosomes, gene, evolution, fossil, natural selection, extinct, biodiversity, endangered, gene bank

Year 9 Biology						
Term	1	2	3	4	5	6
Topic Title	Cell Structures,	what happens in Cells	Respiration,	Photosynthesis	Supplying the cell	Challenges of size
Rationale	Developing the fundamental knowledge of the most basic building blocks for life on Earth. This provides the ground work for more detailed work which comes later in the course	To understand the role of DNA in living organisms; How enzymatic reaction are required for life & factors affecting them.	The two bioenergic processes which are necessary for all life on the planet to function. The two processes and linked and understanding the process gives students knowledge to build on further in their studies		To understand how substances move across cell membranes & How cell tissue arises in so many forms.	To understand how surface area to volume ration affects living organisms & how they have adapted gas exchange surfaces & internal transport systems to cope with multicellular bodies.
Prior knowledge	Y7 work on microscopy and cells	Y7 Cells; Y8 Nutrition	Aerobic & anaerobic respiration; gas exchange Y7; Respiration Y8	photosynthesis; Y8 Photosynthesis topic	Y7 work on movement of substances across cells	Y7 Cells; Y7 gas exchange & breathing topic.
Key knowledge/skills development	State the difference between eukaryotic and prokaryotic cells. Describe the function of sub-cellular structure in eukaryotic and prokaryotic cells. Name examples of prokaryotes. Describe the function of strutures in prokaryotes.	Describe the structure and function of DNA. Triple: Detailed description of functional roles of DNA in body processes.	State the word and symbol equation for aerobic respiration, state the word equation for anaerobic respiration. Triple: balanced symbol equation. Respiration products in plants and yeast fungi (fermentation).	State the word and symbol equation for photosynthesis. Describe the process of photosynthesis. Describe how to test for the products of photosynthesis. State what is meant by a limiting factor. Triple: balanced symbol equation	To be able to understand how molecules pass across cell surface membranes alongside the factors affecting this. To understand how cells arise from other cells and develop into the range of cells with specialised functions.	To appreciate the concept of surface area to volume ratio in regard to maximum cell size. To recognize multicellular organisms need for internal transport systems & gas exchange surfaces and factors need for them to work efficiently. (Both animals & plants).
National Curriculum/specification links	B1.1.1-B1.1.4	B1.2.1-B1.2.4	B1.3.1-B1.3.3	B1.4.1-B1.4.4	B 2.1.1-B2.1.6	B2.2.1 - B2.2.6
Additional Literacy Opportunities	Cells H/W DART Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks	Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks	Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks	Photosynthesis Literacy task Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks	Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks	Use of keyword learning and practise of six mark questions and terminology in Going for Gold or Going Forward type tasks
Additional Numeracy Opportunities	Standard form; converting units; magnification calculations; re-arranging formulae	Rate of reaction graphs & data in tables.	interpret graphs of factors affecting rate of respiration	interpret graphs of factors affecting rate of photosynthesis	Numeric concentration concept for osmosis-water potential.	Factors affecting transpiration rates in plants. Heart rate in animals.Breathing rate in animals.
Biol Comb	STEM WS Lessons 1-8	BIOL PAG1 Microscopy; BIOL PAG 3 Enzymes; BIOL PAG 4 Photosynthesis	CHEM PAG 3 separation techniques; CHEM PAG 2 Distillation	PHYS PAG1 Density-Materials; PHYS PAG5 Energy-Specific Heat Capacity	BIOL PAG 4 Photosynthesis	PHYS PAG 2 Forces; PHYS PAG 3 Motion
Biol Trip	STEM WS Lessons 1-8	BIOL PAG1 Microscopy; BIOL PAG 4 Enzymes; BIOL PAG 8 Transport in/out cells	CHEM PAG 3 Separation techniques; CHEM PAG 4 Distillation	PHYS PAG1 Density-Materials; PHYS PAG5 Energy-Specific Heat Capacity	BIOL PAG 4 Photosynthesis; BIOL PAG 8 Transport in/out cells	PHYS PAG 2 Forces; PHYS PAG 3 Motion
Cross curricular links	Y7 Biology, GCSE Biology	Y7 Biology, GCSE Biology	Y8 Biology, GCSE biology, GCSE/BTEC P.E.	Y8 Biology.	Y7 Biology, GCSE Biology	Y7 Cells; Y7 gas exchange & breathing topic. P.E. exercise effects on heart rate.
Key vocabulary	Cell, cell wall, nucleus, Eukaryotic, prokaryotic, mitochondrion, cytoplasm	DNA; nucleotide; Base; monomer; polymer; enzyme; substrate; active site; products	Aerobic, anaerobic, glucose, oxygen, carbon dioxide, water, energy, photosynthesis.	Glucose, oxygen, carbon dioxide, water, energy, photosynthesis.	Diffusion; Osmosis; water potential; concentration; dilute; Active transport; mitochondria; mitosis; chromosome; differentiation	Lungs; bronchus; trachea; bronchioles;alveoli;gas exchange; cilia; diffusion gradient; artery;vein; capillary;heart;atrium; ventricle; aorta; vena cava; pulmonary.