THE ABBEY SCHOOL
A BUSINESS & ENTERPRISE ACADEMY

Subject: Biology

Year 10
Scheme of Learning 2025-2026

Subject leader: Mr S Brock

Topics by term	Topic overview for Year 10					
	Term 1	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Topics taught	**Biology** – B3; infection and response	**Biology** – B4; bioenergetics	**Biology** – B4; bioenergetics B5a; the nervous system	**Biology** – B5a; the nervous system B5c; the endocrine system	**Biology** – B5c; the endocrine system	**Biology** – B6a; DNA and reproduction
Prerequisites	**Vital Prerequisites**	**Vital Prerequisites**	**Vital Prerequisites**	**Vital Prerequisites**	**Vital Prerequisites**	**Vital Prerequisites**

	Basic understanding of the cell structure of bacteria using skills and knowledge from year 9. Knowledge of structural adaptations of some unicellular organisms from ks3. Understanding and knowledge of white blood cells (body defences) from year 9. Basic understanding of animal and plant tissues from year 9. Basic understanding of non-communicable and communicable diseases from key year 8, and year 9.	An understanding of the process of photosynthesis, using skills developed during Year 7, Year 8 and Year 9. Knowledge of the photosynthesis word equation and understanding of the reactants and products, using knowledge developed in ks3. Basic understanding of how plants make food, developed through skills in ks3. Knowledge of respiration and gas exchange from ks3.	Knowledge of respiration and gas exchange from ks3. Basic knowledge of the difference between aerobic and anaerobic respiration developed in ks3. An understanding of blood and tissues in the body from year 9. Basic understanding of type 1 and type 2 diabetes developed in year 7 Understanding of a nerve cell (specialised cells) from year 9, B1.	Basic understanding of reproduction developed in ks3. An understanding of male and female reproductive systems and organs, developed in ks3. A basic knowledge of the menstrual cycle (without details of hormones), from ks3.	A basic knowledge of the menstrual cycle (without details of hormones), from ks3. Basic understanding of reproduction developed in ks3. An understanding of male and female reproductive systems and organs, developed in ks3.	Understanding of how genetic information is transmitted from one generation to the next, from ks3. Basic understanding of the terms chromosomes, genes and DNA along with the DNA model (Watson, Crick, Wilkins and Franklin), from ks3. AN understanding of differences between species, developed in ks3. An understanding of mitosis from year 9. Basic understanding of how changes in the environment may leave individuals within a species, adaptations within a species with successful

						reproduction and how extinction may occur, developed in ks3. A basic understanding of natural selection, developed form ks3.
	Why are we teaching this now?	**Why are we teaching this now?**	**Why are we teaching this now?**	**Why are we teaching this now?**	**Why are we teaching this now?**	**Why are we teaching this now?**
	To understand that during meiosis the number of chromosomes in a cell is halved and then new genes are combined with a sexual partner to then produce a unique offspring. Mutations can be beneficial and damaging, leading to a variety of genetic disorder or potentially death. Natural selection occurs off of the basis of genetic mutations –	To harness an understanding of how plants use sunlight to make food through the process of photosynthesis. Plants and animals use of oxygen in order to carry out aerobic respiration which in turn allows the organism to function appropriately. Aerobic respiration is with oxygen. Anaerobic is without oxygen. Oxygen + Glucose -> Carbon dioxide +	To understand the principles of nervous coordination and control in humans. To identify and harness the relationship between the structure and function of the human nervous system. To gain an understanding of what is meant by the 'reflex arc'. Learners will be able to effectively explain how the nervous	To gain further understanding of how the cells in the human body need specific conditions to survive. Identifying the physical and chemical limits of these. Allow learners to explain how homeostasis is the regulation of internal conditions of an organism – and further how the optimum conditions for function can be maintained.	To gain an understanding of the different reproductive hormones within males and females. To harness an understanding of human reproduction, hormonal and non-hormonal methods of contraception. Hormonal coordination role within the menstrual cycle. Understanding of how drugs can be used to help increase fertility.	To gain an enhanced understanding of the genetic material of an organism. To be able to effectively describe the structure of DNA. Learners will harness an understanding of the term genome. Provide an understanding of how the genome can influence the characteristics (phenotype) of an organism.

	this is how species evolve. Selective breeding can therefore be understood and implemented whereby plants or animals are deliberately bred to achieve favourable characteristics, cloning can then be further repeated on offspring to keep the desired characteristics. Genetic engineering has then be developed as scientists take genes out of a species and integrate them into a new genome. Despite the controversy of ethical concerns surrounding.	Water Vapour + (Energy). Glucose -> Lactic Acid The human body cannot supply oxygen to the cells during intense, vigorous exercise. Lactic acid is produced during anaerobic respiration which causes fatigue due to the build-up in muscles.	system is adapted to its function. To gain an enhanced understanding of homeostasis. To understand how control systems use receptors to sense change and effectors bring about these changes to maintain homeostasis.	To gain an understanding of the endocrine system. How hormonal coordination and control works within an organism. Learners can describe the control of blood glucose concentration. Identifying what hormones are released when blood glucose levels are too high and when levels are too low. To harness an understanding of human reproduction, hormonal and non-hormonal methods of contraception. Hormonal coordination role within the menstrual cycle.		To develop an understanding of Meiosis – and the difference between meiosis and mitosis. What is meant by the terms phenotype and genotype. To provide an understanding of how we can predict phenotypes using genotypes in Punnett Squares and inheritance diagrams. To gain an understanding of dominant and recessive phenotypes and how this can affect offspring phenotypes. To identify inherited disorders and their symptoms. Gain and understanding of sex determination,

						The difference between sexual and asexual reproduction.

Exam Board AQA							
Topic Big question	**Lesson questions**	**Lesson objective**	**Outcomes**	**Key Terms** **Literacy** **Numeracy** **Practical activities**	**Assessment and homework tasks**	**Resources**	**Personal Development curriculum links (SMSC, British Values, PSHE)**
Term 1							
B3 – Infection and response							
What causes infection, and how can we prevent it?	How are communicable diseases spread?	To be able to identify the four main types of pathogens and have a general awareness of how the spread of these pathogens can be prevented.	- To define the term pathogen and state the four main groups of pathogen. - To explain how pathogens can be spread to plants or animals and cause infection. - To describe the main differences between bacteria and viruses. - To explain how the spread of disease can be reduced or prevented.	Bacteria Fungus Microorganisms Pathogens Protist Virus	Homework tasks linked to the lesson question. Plenary questions at the end of every lesson.	Knowledge organiser CGP textbook Standardised lesson presentations	British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to, and respect others' opinions.
	What diseases are caused by a virus?	To be able to recall information about viral diseases such as symptoms, transmission and how to reduce spread.	- To describe the symptoms, mode of transmission, prevention and treatment for measles, HIV and tomato mosaic virus. - To describe colds and flu as viral diseases.	HIV Influenza Measles Tomato tobacco virus Virus			SMSC – Discussion linked to recent covid pandemic.
	What are the differences between fungal and protest diseases?	To be able to recall information about fungal and protist diseases such as symptoms,	- To describe the symptoms, mode of transmission, prevention and treatment for rose black spot, malaria and athletes foot.	Fungus Fungicides Malaria Mosquitoes Protest			SMSC – Is it ethical to kill vectors to control the spread of disease?

		transmission and how to reduce spread.		Rose black spot Vector			
	What are bacterial diseases and how can we prevent the spread of disease?	To be able to recall information about bacterial diseases such as symptoms, transmission and how to reduce spread.	- To describe the symptoms, mode of transmission, prevention and treatment for gonorrhoea and *salmonella* food poisoning. - To suggest suitable methods to prevent the spread of disease such as isolation, destroying vectors and vaccination.	Bacteria Gonorrhoea *Salmonella*			SMSC – Discussion linked to recent covid pandemic, is it ethical to enforce individuals to isolate?
	How are our bodies adapted to fight disease?	To be able to describe and explain some of the body's defence systems such as physical barriers and the immune system.	- To describe the body's first line defences such as the skin, hairs in the nose, secretion of mucus and stomach acid. - To explain how microbes make us feel ill and how viruses damage cells. - To explain how the immune system defends against disease. - To describe what white blood cells do.	Antibody Antigen Antitoxin Pathogen White blood cell			SMSC – Are 'measles parties' ethical?
	How do vaccinations work?	To be able to explain how a vaccine works to prevent disease.	- To describe what a vaccine contains. - To explain how vaccines prevent disease. - To explain the idea of 'herd immunity'.	Antibody Antigen Antitoxin Pathogen Vaccination White blood cell			SMSC – Discussion around vaccinations, should we enforce them?
		To be able to state the difference between painkillers and antibiotics, and	- To state which drugs come from plants and microorganisms.	Antibiotics Painkillers Resistance			SMSC – why is antibiotic resistance a major

		explain how each works.	- To give examples of painkillers and other medicines used to treat symptoms. - To describe Fleming's discovery and explain its importance.				worldwide problem?
	How are drugs developed?	To be able to describe the stages involved in a drug trial, and explain why each stage is necessary.	- To explain why drugs need to be tested and describe the main steps in drug development. - To give reasons for the different stages in drug testing.	Blind trial Clinical trial Double-blind trial Efficacy Placebo Preclinical trial Toxicity			SMSC – Is it ethical to test new drugs on animals?
Term 2							
B4 - Bioenergetics							
Why are photosynthesis and respiration important processes?	What is photosynthesis?	To be able to define photosynthesis, write the word and symbol equation for photosynthesis and explain how the leaf is adapted for efficient photosynthesis.	- To state that carbon dioxide and water are the raw materials used in photosynthesis and that glucose and oxygen are the products. - To state the word and symbol equations for photosynthesis. - Name and locate the parts of a leaf. - To explain how the cellular structure of a leaf is adapted for efficient photosynthesis.	Chlorophyll Epidermis Palisade mesophyll Photosynthesis Spongy mesophyll Vascular bundle	Termly assessment for B3 – infection and response Homework tasks linked to the lesson question. Plenary questions at the end of every lesson.	Knowledge organiser CGP textbook Standardised lesson presentations	British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to, and respect others' opinions.

	How do plants use glucose?	To be able to describe and explain what the plants uses the glucose for which is made during photosynthesis.	- To explain that glucose can be converted to other substances in plants. - To describe the functions of fats, oils, cellulose, starch and proteins in the plant. - To test for the presence of starch.	Amino acids Cellulose Glucose Nitrate ions Photosynthesis Respiration Starch Testing a leaf for starch; **practical activity**	Homework tasks linked to the lesson question. Plenary questions at the end of every lesson.		
	What factors affect the rate of photosynthesis?	To be able to define mitosis as a process in which body cells replicate.	- To state that the rate of photosynthesis is affected by temperature, light intensity, carbon dioxide levels and the amount of chlorophyll. - To interpret graphs of photosynthesis rate involving one limiting factor. - To explain graphs of photosynthesis rate involving two or three factors and decide which one is the limiting factor (higher only).	Carbon dioxide Light intensity Limiting factor Temperature			
	How can we investigate the rate of photosynthesis? **REQUIRED PRACTICAL**	To investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed.	- To follow a method and set up the equipment as appropriate. - To count the number of bubbles as the dependent variable, and change the distance of the lamp from the	Photosynthesis Pondweed Variables To calculate the rate of photosynthesis using number of bubbles / min; or cm / min.			SMSC – should aquatic plant life be used for this purpose?

			pondweed as the independent variable. - To determine control variables and write a risk assessment. - To draw valid conclusions from results and evaluate the method used.	Investigating the effect of light intensity on the number of oxygen bubbles produced, **practical activity**.			
	What is the inverse square law? **(Higher only)**	To be able to define the inverse square law and use it to calculate light intensity or distance.	- To define the Inverse Square Law. - To explain the relationships within the Inverse Square Law. - To evaluate primary data against calculations involving inverse square law.	Inverse square law Proportional To calculate the light intensity, or distance moved using the equation: light intensity α $1/d^2$			British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to, and respect others' opinions.
	How can we artificially control the growth of plants? **(Higher only)**	To be able to describe and explain how factors can be artificially controlled to maximise plant growth.	- To state that heating and lighting a greenhouse can increase food production. - To describe ways to increase food production by controlling limiting factors. -	Greenhouse Yield			
Term 3							
B4 – Bioenergetics							
Why are photosynthesis and respiration important processes?	What is aerobic respiration?	To be able to define what aerobic respiration is and recall it as a word and symbol equation.	- To state the need for the release of energy by the breakdown of glucose during aerobic respiration.	Aerobic ATP Energy Glucose	End of topic assessment for B4. Homework tasks linked to	Knowledge organiser CGP textbook Standardised lesson presentations	British values – respect through silence is a key aspect of the

			- To determine the products of aerobic respiration. - To describe aerobic respiration using a word equation. - To determine the symbol equation for aerobic respiration.	Determining the products of aerobic respiration, **practical activity.**	the lesson question. Plenary questions at the end of every lesson.		Abbey science lessons. – Students are expected to listen to, and respect others' opinions.
	How is anaerobic respiration different to aerobic respiration?	To be able to define what anaerobic respiration is and explain how it is different to aerobic respiration.	- To know that the body needs to react to provide more energy during exercise. - To describe the relationship between heart rate, breathing rate and breath volume during exercise. - To explain what happens during the recovery period.	Ethanol Fermentation Lactic acid Muscle Oxygen debt Yeast			
	How does respiration change during exercise?	To be able to describe and explain what happens to respiration during exercise, and the recovery period.	- To describe how villi are adapted to aid the absorption of nutrients. - To explain how the gills and leaves are adapted to maximise the exchange of gases. - To define metabolism.	Fatigue Muscle Oxygen Oxygen debt Investigating how different types of exercise affect heart rate, **practical activity**.			

B5a – The nervous system							
How does the nervous system allow our body to respond to different situations?	What is homeostasis?	To be able to define homeostasis and explain why negative feedback is essential to maintain it.	- To identify factors which need to be controlled in the body. - To explain why specific factors need to be controlled in the body. - To explain how negative feedback works.	Control centres Effectors Homeostasis Negative feedback Receptors Stimulus	Homework tasks linked to the lesson question. Plenary questions at the end of every lesson.	Knowledge organiser CGP textbook Standardised lesson presentations	British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to, and respect others' opinions.
	Why is the nervous system essential for survival?	To be able to describe and explain the function of the nervous system and how it works to respond to stimuli.	- To describe the organisation of the nervous system and its function. - To describe the stimulus-response pathway. - To use models to explain the role of sensory, motor and relay neurons.	Central nervous system Myelin sheath Neurone Peripheral nervous system Receptor			
Term 4							
B5a – The nervous system							
How does the nervous system allow our body to respond to different situations?	How are electrical impulses passed from the stimulus to the effector?	To be able to describe the role of a synapse, and explain the path of the reflex arc.	- To describe how a synapse aids the transmission of impulses. - To explain the path of the reflex arc. - To explain how the structures in the reflex arc are adapted to carry out their function.	Motor neurone Reflex action Reflex arc Relay neurone Sensory neurone Synapse	End of topic assessment covering the nervous system. Homework tasks linked to the lesson question. Plenary questions at the	Knowledge organiser CGP textbook Standardised lesson presentations	British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to, and respect others' opinions.

	How do you measure reaction time? **REQUIRED PRACTICAL**	To be able to investigate the effect of a factor on human reaction time.	- To follow a method and set up the equipment as appropriate. - To determine variables and write a risk assessment. - To carry out the ruler drop test under normal conditions, and 'distracted' conditions. - To draw valid conclusions from the results and evaluate the method used. - To determine other factors that could be tested and/or another method to measure reaction time.	Reaction time Variables To be able to calculate the mean from results collected. Ruler drop test, **practical activity**	end of every lesson.		SMSC – could link to issues such as drink/drug driving, use of mobile phone whilst driving.
B5c – The endocrine system							
How do hormones control important processes in our body?	What are hormones?	To be able to define what a hormone is and identify the endocrine glands.	- To describe the endocrine system. - To explain the function of the major endocrine glands and their hormones. - To explain how the endocrine system works to bring about changes to the body.	Adrenal gland Endocrine Ovaries Pancreas Pituitary gland Testes Thyroid	Homework tasks linked to the lesson question. Plenary questions at the end of every lesson.	Knowledge organiser CGP textbook Standardised lesson presentations	SMSC – discussion around HRT.
	How are blood glucose levels controlled? *(Some higher content)*	To be able to describe and explain how blood glucose levels are controlled, and compare treatment options for diabetes.	- To identify the organs involved in blood glucose control. - To explain how insulin reduces blood glucose levels.	Diabetes Glucose Glucagon – higher only			SMSC – discussion around the ethics of different diabetes treatments (pancreas transplant,

			- *To explain how glucagon increases blood glucose levels*. - To describe different treatment options for type 1 and type 2 diabetes.				artificial pancreas).
Term 5							
B5c – The endocrine system							
How do hormones control important processes in our body?	What hormones are involved in the menstrual cycle? *(Some higher content)*	To be able to outline the stages in the menstrual cycle and name the hormones involved.	- To name the hormones involved in sexual secondary characteristics and describe their roles. - To describe the roles of all the hormones involved in the menstrual cycle. - *To explain how the hormones interact to control the menstrual cycle*.	Follicle FSH LH Oestrogen Progesterone Secondary sex characteristics Testosterone	Termly assessment covering the endocrine system. Homework tasks linked to the lesson question. Plenary questions at the end of every lesson.	Knowledge organiser CGP textbook Standardised lesson presentations	SMSC – discussion around HRT.
	What contraceptive methods can be used to prevent pregnancy?	To be able to evaluate different methods of contraception.	- To name and describe the different non-hormonal methods of contraception.	Abstinence Condoms Contraceptive pill Intrauterine devices			SMSC – discussion of different types of contraception.

			- To explain how non-hormonal and hormonal methods of contraception work. - To compare the effectiveness of different methods.	Oestrogen Progestogen Progestogen-only pill			
	How does IVF increase a woman's chance of having a baby? **(higher content only)**	To be able to describe the process of IVF and evaluate the process in terms of scientific, emotional, social and ethical issues.	- To describe the steps involved in in-vitro fertilisation. - To explain how hormones are used to carry out the process of in-vitro fertilisation. - To describe the issues involved in undergoing IVF treatment. - To evaluate the scientific, emotional, social and ethical issues of in-vitro fertilisation.	Embryo FSH *in-vitro* fertilisation (IVF) LH Ovaries Uterus			SMSC – discussion around the ethics of IVF.
	What processes do the hormones thyroxine and adrenaline control? **(higher content only)**	To be able to describe and explain where these hormones are produced, and what their role is.	- To describe the effects of thyroxine and adrenaline in the body. - To explain how thyroxine and adrenaline levels are controlled by negative feedback mechanisms and what happens if they are dysregulated.	ADH Basal metabolic rate Hypothalamus Negative feedback Pituitary gland Thyroxine			SMSC – discussion around HRT.
Term 6							
B6a – DNA and replication							
What makes you, you?	What makes you unique?	To be able to define the terms DNA and gene, and explain	- To describe the structure of DNA.	Chromosome DNA	End of year assessment focussing on all	Knowledge organiser	SMSC – discussion around any

		what the human genome is.	To describe a gene as a small section of DNA that codes for a protein. - To explain the importance of understanding the human genome.	Gene Genome	the topics covered throughout the year. Homework tasks linked to the lesson question. Plenary questions at the end of every lesson.	CGP textbook Standardised lesson presentations	ethical issues relating to the human genome project.
	How do we reproduce?	To be able to describe sexual and asexual reproduction, and state the difference between them.	- To state the definition for sexual and asexual reproduction. - To understand that sexual reproduction involves two parents and generally produces unique offspring. - To understand that asexual reproduction involves just one parent and produces genetically identical offspring. - To compare sexual and asexual reproduction.	Asexual reproduction Clone Sexual reproduction Variation			SMSC – discussion around sexual reproduction and can link back to previous ideas such as contraception and IVF.
	How do the gametes divide?	To be able to describe and explain how the gametes divide via meiosis.	- To recall that meiosis halves the number of chromosomes for gamete production. To understand that fertilisation restores the chromosome number. - To explain how in meiosis the cell divides twice to form four gametes, each with a single set of chromosomes, and that	Gamete Genetic variation Meiosis			British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to, and respect others' opinions.

			all gametes are genetically different. - To compare meiosis with mitosis.				