Glenthorne High School
Achievement for all
An outstanding National Teaching School with a specialism in the Arts

B1 Key Word Glossary

active transport: the movement of substances from a dilute solution to a more concentrated solution against a concentration gradient, requiring energy from respiration

algae: simple aquatic organisms (protista) that make their own food by photosynthesis

alveoli: tiny air sacs in the lungs that increase the surface area for gaseous exchange

bacteria: single-celled prokaryotic organisms

cell membrane: the membrane around the contents of a cell that controls what moves in and out of the cell

cell wall: the rigid structure around plant and algal cells. It is made of cellulose and strengthens the cell

cellulose: the complex carbohydrate that makes up plant and algal cell walls and gives them strength

chlorophyll: the green pigment contained in the chloroplasts

chloroplasts: the organelles in which photosynthesis takes place

cytoplasm: the water-based gel in which the organelles of all living cells are suspended and most of the chemical reactions of life take place

diffusion: the spreading out of the particles of any substance in a solution, or particles in a gas, resulting in a net movement of particles from an area of higher concentration to an area of lower concentration down a concentration gradient

eukaryotic cells: cells from eukaryotes that have a cell membrane, cytoplasm, and genetic material enclosed in a nucleus

hypertonic (osmosis): a solution that is more concentrated than the cell contents

hypotonic (osmosis): a solution that is less concentrated than the cell contents

isotonic (osmosis): a solution that is the same concentration as the cell contents

mitochondria: the site of aerobic cellular respiration in a cell

nucleus: organelle found in many living cells containing the genetic information surrounded by the nuclear membrane

osmosis: the diffusion of water through a partially permeable membrane from a dilute solution (which has a high concentration of water) to a concentrated solution (with a low concentration of water) down a concentration gradient

partially permeable membrane: a membrane that allows only certain substances to pass through

permanent vacuole: space in the cytoplasm filled with cell sap

phloem: the living transport tissue in plants that carries dissolved food (sugars) around the plant

plasmolysis: the state of plant cells when so much water is lost from the cell by osmosis that the vacuole and cytoplasm shrink and the cell membrane pulls away from the cell wall

prokaryotic cells: from prokaryotic organisms have a cytoplasm surrounded by a cell membrane, and a cell wall that does not contain cellulose. The genetic material is a DNA loop that is free in the cytoplasm and not enclosed by a nucleus. Sometimes there are one or more small rings of DNA called plasmids

resolving power: a measure of the ability to distinguish between two separate points that are very close together

ribosomes: the site of protein synthesis in a cell

sperm: the male sex cells or gametes that carry the genetic material from the male parent

stomata: openings in the leaves of plants, particularly on the underside and opened and closed by guard cells, allowing gases to enter and leave the leaf

turgor: the pressure inside a plant cell exerted by the cell contents pressing on the cell wall

ventilation: movement of air or water into and out of the gas exchange organ, for example lungs or gills

xylem: the non-living transport tissue in plants that transports water from the roots to the leaves and shoots

adult stem cells: stem cells that are found in adults that can differentiate and form a limited number of cells

cell cycle: the three-stage process of cell division in a body cell that involves mitosis and results in the formation of two identical daughter cells

cloning: the production of identical offspring by asexual reproduction

differentiate: the process where cells become specialised for a particular function

embryonic stem cells: stem cells from an early embryo that can differentiate to form the specialised cells of the body

mitosis: part of the cell cycle where one set of new chromosomes is pulled to each end of the cell forming two identical nuclei during cell division

stem cells: undifferentiated cells with the potential to form a wide variety of different cell types

therapeutic cloning: a process where an embryo is produced that is genetically identical to the patient so the cells can then be used in medical treatments

zygote: the single new cell formed by the fusion of gametes in sexual reproduction

B2 Key Word Glossary

Amylase: An enzyme produced in the salivary glands and pancreas that breaks carbohydrates down into simple sugars.

Aorta: The main artery that takes oxygenated blood away from the heart to the body.

Artery: A blood vessel that carries blood at high pressure away from the heart.

Benign tumour: An abnormal cell growth that is contained within one area and does not invade other areas of the body.

Bile: A substance made in the liver and stored in the gallbladder which is used to neutralise stomach acid in the intestine and emulsify fats.

Blood: A tissue containing red blood cells, white blood cells, platelets and plasma.

Cancer: A non-communicable disease caused by changes in the cell that lead to uncontrolled growth and division.

Capillary: A very thin blood vessel that is used for exchange of substances.

Cell: The basic building block of all living organisms.

Communicable disease: A disease that can be spread between individuals either directly or indirectly.

Coronary heart disease: A disease caused by the buildup of fatty deposits inside the coronary artery, narrowing it and reducing blood flow to the heart tissue.

Enzymes: Biological catalysts that increase the rate of reactions in living organisms.

Health: The state of physical and mental wellbeing.

Heart: An organ that pumps blood around the body in a double circulatory system.

Lipase: An enzyme that is produced in the pancreas that breaks lipids down into fatty acids and glycerol.

Lock and key hypothesis: A theory that describes how substrates must be the correct shape to fit the active site of an enzyme.

Malignant tumour: A cancerous cell growth that invades neighbouring tissues and can spread to different parts of the body in the blood.

Meristem tissue: Plant tissues containing undifferentiated stem cells.

Metabolism: All of the chemical reactions occurring in an organism.

Non-communicable disease: A disease which cannot be spread between individuals.

Organs: Aggregations of tissues performing specific functions.

Organ systems: Groups of organs that work together to form organisms.

Palisade mesophyll: A tissue found in plant leaves that is specialised to carry out photosynthesis.

Phloem: A transport tissue found in plants which is specialised to transport sugars from source to sink.

Protease: An enzyme produced in the stomach and pancreas that breaks proteins down into amino acids.

Pulmonary artery: The main artery that takes deoxygenated blood away from the heart to the lungs.

Pulmonary vein: The main vein that takes oxygenated blood back to the heart from the lungs.

Rate of reaction: The speed at which reactants are converted into products. Risk factor: Something that increases a person's risk of developing a disease.

Spongy mesophyll: A tissue found in plant leaves that is specialised for gas exchange.

Statins: A class of drugs that are used to reduce blood cholesterol levels which slows down the rate of fatty material deposit.

Stent: A tube that can be surgically implanted into blood vessels to keep them open.

Tissue: A group of cells with a similar structure and function.

Translocation: The movement of food molecules through the phloem tissue.

Transpiration: The process of water evaporating from a plant.

Vein: A blood vessel that carries blood at a low pressure back to the heart.

Vena cava: The main vein that takes deoxygenated blood back to the heart from the body.

Xylem: A transport tissue in plants which is specialised to transport water and dissolved minerals from the roots of the plant to the leaves.

B3 Key Word Glossary

Antibiotics: Medicines that help to cure bacterial disease by killing infective bacteria inside the body.

Clinical drug testing: Drug testing done on healthy human volunteers and patients.

Communicable disease: A disease that can be spread between individuals either directly or indirectly.

Double blind trial: A study performed where neither the researcher or patient know whether the patient is taking the drug or a placebo.

Gonorrhoea: A sexually transmitted disease (STD) caused by a bacterium with symptoms of a thick yellow or green discharge from the vagina or penis and pain on urinating.

Human Immunodeficiency Virus (HIV): An infectious virus that weakens the immune system and can lead to AIDS (acquired immunodeficiency syndrome).

Malaria: A disease caused by a protist that causes recurrent episodes of fever and can be fatal.

Measles: A serious disease caused by a virus that shows symptoms of fever and a red skin rash.

Monoclonal antibodies: Antibodies produced from a single clone of cells that are specific to one binding site on one protein antigen.

Non-communicable disease: A disease which cannot be spread between individuals.

Non-specific defence: General physical and chemical barriers that defend the body against lots of different types of pathogen.

Pathogens: Microorganisms that cause infectious disease.

Placebo: A substance designed to be indistinguishable from a drug being tested but has no actual effect on the patient.

Preclinical drug testing: Drug testing done in a laboratory using cells, tissues and live animals.

Rose black spot: A fungal disease where purple or black spots develop on leaves, which often turn yellow and drop early.

Salmonella: A bacterial disease that is spread by bacteria ingested in food and can cause a fever, abdominal cramps, vomiting and diarrhoea.

Side effects: Other additional effects that the drug has that are different from the expected effect of the drug.

Tobacco Mosaic Virus (TMV): A widespread plant pathogen affecting many species of plants which produces a mosaic pattern on the leaves and limits the plant growth.

Vaccination: The process of introducing small quantities of dead or inactive forms of a pathogen into the body to stimulate the white blood cells to produce antibodies.

White blood cell: An important type of cell that makes up the immune system and produces antibodies and antitoxins.

B4 Key Word Glossary

Aerobic respiration: A form of respiration that uses oxygen to release energy from molecules like glucose.

Anaerobic respiration: A form of respiration that releases energy from molecules like glucose without using oxygen.

Cellular respiration: An exothermic reaction which is continuously occurring in living cells.

Chloroplast: Cell organelle that produces glucose through photosynthesis**.**

Chlorophyll: A green pigment, present in all green plants which is responsible for the absorption of light for photosynthesis.

Fermentation: Fermentation is an anaerobic process that converts glucose into ethanol and carbon dioxide. It is carried out by yeast, a type of single-celled fungus.

Inverse proportion: A relationship between two values whereas one value increases, the other value decreases at the same rate.

Inverse square law: As the distance from a light source increases, the light intensity is inversely proportional to the distance squared.

Limiting factor: A factor that limits the rate of a reaction when there is not enough of it.

Metabolism: The sum of all the reactions in a cell or the body.

Mitochondria: Organelles where aerobic respiration takes place and energy is released.

Oxygen debt: The amount of extra oxygen the body needs after exercise to react with the accumulated lactic acid and remove it from the cells.

Photosynthesis: An endothermic reaction in which energy is transferred from the environment to the chloroplasts by light.

Yeast: A type of single-celled fungus.

Brewing: To make beer or wine.

B5 Key Word Glossary

central nervous system (CNS): the part of the nervous system where information is processed. It is made up of the brain and spinal cord

cerebral cortex: region of the brain associated with consciousness, memory, and language

cerebellum: region of the brain concerned with coordinating muscular activity and balance

ciliary muscles: muscles that contract and relax to change the shape of the lens of the eye

coordination centres: areas that receive and process information from receptors

effectors: areas (usually muscles or glands) that bring about responses in the body

homeostasis: the regulation of the internal conditions of a cell or organism to maintain optimum conditions for function, in response to internal and external changes

hyperopia: long sightedness, where the rays of light from distant objects can be focused clearly on the retina but the rays of light from close objects are not focused and the objects appear blurred

medulla: region of the brain concerned with unconscious activities such as controlling the heart rate and breathing rate

motor neurones: carry impulses from the central nervous system to the effector organs

myopia: short sightedness, where the rays of light from close objects are brought into focus on the retina but distant objects appear blurred as the light is focused in front of the retina

nerve: bundle of hundreds or even thousands of neurones

neurones: basic cells of the nervous system that carry minute electrical impulses around the body

receptors: cells that detect stimuli – changes in the internal or external environment

reflex arcs: bring about a reflex action. They involve the sense organ, sensory neurone, relay neurone and motor neurone

reflexes: rapid automatic responses of the nervous system that do not involve conscious thought

sensory neurone: neurone that carries impulses from the sensory organs to the central nervous system

stimuli: changes in the external or internal environment that can be detected by receptors

suspensory ligaments: the ligaments that connect the lens of the eye to the ciliary muscles
ADH: anti-diuretic hormone helps control the water balance of the body and affects the amount of urine produced by the kidney

Adrenaline: hormone that prepares the body for flight or fight

Auxin: a plant hormone that controls the responses of plants to light (phototropism) and gravity (gravitropism)

Contraception: methods of preventing pregnancy which usually involve preventing the sperm and egg from meeting

endocrine system: the glands that produce the hormones that control many aspects of the development and metabolism of the body, and the hormones they produce

follicle stimulating hormone (FSH): causes the eggs to mature in the ovary

gibberellins: plant hormones that are important in initiating seed germination

glucagon: hormone involved in the control of blood sugar levels

gravitropism: the response of a plant to gravity

hormones: chemicals produced in one area of the body of an organism that have an effect on the functioning of another area of the body. In animals hormones are produced in glands

insulin: hormone involved in the control of blood sugar levels

oestrogen: female sex hormone that controls the development of secondary sexual characteristics in girls at puberty, and the build-up and maintenance of the uterus lining during the menstrual cycle

ovaries: female sex organs that produce eggs and sex hormones

ovulation: the release of a mature egg (ovum) from the ovary

phototropism: the response of a plant to light, controlled by auxin

pituitary gland: endocrine 'master gland' found in the brain that secretes a number of different hormones into the blood in response to different conditions to control other endocrine glands in the body

testosterone: the main male sex hormone that controls the male secondary sexual characteristics at puberty and the production of sperm

tropism: the responses of plant roots and shoots to environmental stimuli such as light or gravity

type 1 diabetes: a disorder where the pancreas fails to produce sufficient insulin

type 2 diabetes: a disorder where the body cells no longer respond to the insulin produced by the pancreas

ADH: anti-diuretic hormone helps control the water balance of the body and affects the amount of urine produced by the kidney

Dialysis: the process of cleansing the blood through a dialysis machine when the kidneys fail
selective reabsorption: the process in the kidney where the materials needed in the body such as glucose, some mineral ions, and water are reabsorbed back into the blood from the filtrate

thermoregulatory centre: the area of the brain that is sensitive to the temperature of the blood

vasoconstriction: the constriction or narrowing of the blood vessels

vasodilation: the dilation or opening up of the blood vessels

B6 Key Word Glossary

Adult cell cloning: A type of cloning that forms an embryo from an adult body cell.

Allele: A version of a gene.

Amino acids: Small molecules from which proteins are assembled.

Archaea: Primitive bacteria existing in extreme environments.

Asexual reproduction: A form of reproduction involving a single parent. Creates genetically identical offspring.

Binomial system: The universal system of naming organisms using their genus and species.

Charles Darwin: The scientist who developed the theory of evolution by natural selection.

Chromosome: A long, coiled molecule of DNA that carries genetic information in the form of genes.

Classification: The organisation of organisms into groups based on their characteristics and structure.

Coding DNA: A sequence of DNA that codes for the production of a protein.

Complementary: Describes how the chemical bases in DNA pair up with each other. A pairs with T and C pairs with G.

Cuttings: The simplest method of cloning plants. A branch is cut from a parent plant and replanted in compost after removing the lower leaves.

Cystic fibrosis: A cellular membrane disorder resulting from the presence of a recessive allele.

DNA: A double-stranded polymer wound to form a double helix. Carries the genetic code.

Dominant: Describes an allele that is always expressed. Represented by a capital letter.

Embryo screening: A procedure used to determine the presence of faulty genes in an embryo produced by IVF. A few embryonic cells are removed and screened for defective alleles.

Embryo transplants: The simplest method of animal cloning. Cells are removed from a developing embryo, split apart and grown in culture, before being transplanted into host mothers.

Evolution: The gradual change in the inherited traits within a population over time. Occurs due to natural selection.

Evolutionary tree: A diagram which illustrates the evolutionary relationships between organisms.

Extinction: The death of all members of a species.

Family tree: A chart used to show the inheritance of a condition in a family.

Fertilisation: The fusion of the nucleus of male and female gametes. Restores the full chromosome number.

Fossil: The remains of dead organisms found in rocks which are millions of years old.

Gametes: Sex cells (sperm and egg cells) with half the usual number of chromosomes.

Gene: A section of DNA that codes for a specific sequence of amino acids which undergo polymerisation to form a protein.

Genetic engineering: The modification of the genome of an organism by the insertion of a desired gene from another organism, enabling the formation of organisms with beneficial characteristics.

Genome: The complete genetic material of an organism.

Genotype: An organism's genetic composition. Describes all alleles.

GM crops: Crops that have had their genomes modified by the insertion of a desired gene from another organism.

Heterozygous: When someone has two different alleles of a gene e.g. Ff.

Homozygous: When someone has two identical alleles of a gene e.g. ff.

Inbreeding: The formation of offspring from the breeding of closely related individuals.

Linnaean system: The classification of organisms into kingdom, phylum, class, order, family, genus and species, as developed by Carl Linnaeus.

Meiosis: A form of cell division that produces gametes, non-identical cells with half the usual number of chromosomes.

Mitosis: A form of cell division that produces two genetically identical daughter cells (with a full set of chromosomes) from one parent cell.

MRSA: A type of bacteria that is resistant to the antibiotic, methicillin.

Mutation: A random change in DNA which may result in genetic variants.

Natural selection: The process by which the frequency of advantageous traits passed on in genes gradually increases in a population over time.

Non-coding DNA: DNA which does not code for a protein but instead controls gene expression.

Nucleotide: The monomers of DNA consisting of a common sugar, a phosphate group and one of four chemical bases (A, T, C, G) attached to the sugar.

Phenotype: An organism's observable characteristics. Due to interactions of the genotype and the environment.

Polydactyly: A condition where an individual is born with extra fingers or toes due to the presence of a dominant allele.

Protein synthesis: The formation of a protein from a gene.

Punnett square: A genetic diagram used to predict the potential outcomes of a genetic cross.

Recessive: Describes an allele that is only expressed in the absence of a dominant allele. Represented by a small letter.

Ribosomes: Sub-cellular structures where protein synthesis takes place.

Selective breeding: The process by which humans artificially select organisms with desirable characteristics and breed them to produce offspring with desirable phenotypes.

Sex chromosomes: A pair of chromosomes responsible for the determination of gender. XY in males. XX in females.

Sexual reproduction: A form of reproduction involving the fusion of male and female gametes. Creates genetic variation.

Speciation: The formation of new species in the course of evolution, often due to the evolution of two isolated populations.

Species: A group of similar organisms that are able to breed with one another to produce fertile offspring.

Three-domain system: A method of classification in which organisms are categorised into three groups; Archaea, Bacteria and Eukaryota. Developed by Carl Woese.

Tissue culture: A method of growing living tissue or cells in a suitable medium to produce clone plants.

Variation: The differences between individuals due to genes, the environment or a combination of both.

Vector: A carrier used to transfer a gene from one organism to another.

B7 Key Word Glossary

Abiotic factors: The non-living aspects of an ecosystem e.g. temperature, light intensity, moisture, wind direction, wind intensity, soil pH, soil mineral content, carbon dioxide levels and oxygen levels.

Adaptation: A feature of an organism that increases its chance of survival in its environment. Such features may be behavioural, structural or functional.

Anaerobic decay: Decomposition in the absence of oxygen (commonly occurring in waterlogged soils) that produces carbon dioxide and methane gas.

Apex predator: A carnivore at the top of the food chain with no predators. Biodiversity: The variety of living organisms in an ecosystem.

Biogas: A type of biofuel (methane gas) produced by anaerobic decay in biogas generators.

Biotic factors: The living components of an ecosystem e.g. food availability, pathogens, predators and other species.

Carbon cycle: The cycle through which carbon (in the form of carbon dioxide) moves between living organisms and the environment, involving respiration, photosynthesis and combustion.

Community: All of the populations of different species living together in a habitat.

Competition: When different organisms compete for the same resources (e.g. light, water, mates, territory) in an ecosystem. This limits population sizes and stimulates evolutionary change.

Compost: Dead and decaying organic matter, commonly used as a fertiliser.

Decomposers: Organisms that release enzymes which catalyse the breakdown of dead plant and animal material into simpler organic matter.

Decomposition: The breakdown of dead materials into simpler organic matter. The rate of decomposition is affected by temperature, water and oxygen availability.

Deforestation: The removal of trees from land which is subsequently used to grow crops or provide space for cattle.

Distribution: The spread of living organisms in an ecosystem. It is affected by environmental changes which may be seasonal, geographic or man-made.

Ecosystem: The community of organisms (biotic) and non-living (abiotic) components of an area and their interactions.

Efficiency of biomass transfer: The efficiency of biomass transfer between trophic levels.

Extremophiles: Organisms that can live in extreme environments e.g. high temperatures, high salinity.

Food chain: Describes the feeding relationships between organisms and the resultant stages of biomass transfer. It takes the form: producer ⟶ primary consumer ⟶ secondary consumer ⟶ tertiary consumer.

Food security: Ensuring that populations have access to adequate amounts of safe and nutritious food.

Global warming: The gradual rise in the average temperature of the Earth due to increasing atmospheric levels of carbon dioxide and methane gas.

GM crops: Crops that have had their genomes modified by the insertion of a desired gene from another organism.

Interdependence: The dependence of different organisms on each other for survival e.g. plants depend on pollinators, herbivores depend on plants.

Mean: The average of a set of numbers calculated by dividing the sum of the values by the number of values.

Median: The middle number in a list of values ordered from lowest to highest.

Microorganisms: Very small organisms involved in the recycling of materials in an ecosystem. They return mineral ions to the soil and convert carbon to carbon dioxide which is released into the atmosphere.

Mode: The number that occurs most commonly in a set of data values.

Mycoprotein: A food high in protein (suitable for vegetarians) that is produced by the microorganism, Fusarium, in fermentation vats.

Peat Bogs: Areas of peat soil in wetland habitats formed by the accumulation of partially decayed organic matter. Peat is commonly used as a garden compost.

Pollution: Contamination or destruction of the natural environment due to human intervention.

Population: All organisms of the same species living with one another in a habitat.

Predators: Consumers that prey on and eat other animals.

Prey: Animals that are eaten by predators.

Primary consumers: Herbivores that consume producers at trophic level 2 of a food chain.

Producers: Photosynthetic organisms (e.g. green plant or alga) at the start of the food chain that provide biomass for all living things.

Pyramid of biomass: A table of the dry mass of living material at each trophic level of a food chain. This forms the shape of a pyramid.
Quadrat: A square grid of known area used in sampling to determine the abundance and distribution of organisms in an ecosystem.

Secondary consumers: Carnivores that consume herbivores at trophic level 3 of a food chain.

Sustainable: The ability to maintain something for future generations.

Sustainable fisheries: Methods of harvesting fish at a sustainable rate and increasing fish stocks, for example, by controlling net size or introducing fishing quotas.

Tertiary consumers: Carnivores that consume other carnivores at trophic levels 4 and above of a food chain.

Transect: A line along an area used in sampling to determine the abundance and distribution of organisms in an ecosystem.

Trophic level: The position of an organism in a food chain.

Water cycle: The cycle through which water moves between living organisms and the environment, involving evaporation, transpiration, condensation and precipitation