

Subject Knowledge Audit - Biology

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| Please decide on your ability to teach the content/skills listed below at KS3/KS4 | |
| KEY: | |
| 4 | No knowledge – Currently a gap in my subject area |
| 3 | Limited knowledge – Would not feel confident to teach this content |
| 2 | Good knowledge – Confident in ability to teach with some guidance |
| 1 | Expert knowledge - Confident to teach |
| The completed subject audit will be used by your Mentor to create your Individual Training Plan. Your progress will be reviewed on a fortnightly basis. | |
| You should review and record your progress at each review window below (and share this with your Mentor) | |

| Subject Area: | Science – Biology KS3 | Baseline (4 -1) | Dec. (3 -1) | May (3 -1) | Target for NQT year if applicable |
|---|--|-----------------|-------------|------------|-----------------------------------|
| Structure and function of living organisms | | | | | |
| Cells and organisation | cells as the fundamental unit of life, cell structure using a microscope | | | | |
| | the functions of the chloroplast, vacuole, cell wall, cell membrane, cytoplasm, mitochondria and nucleus | | | | |
| | the similarities and differences between plant and animal cells | | | | |
| | the role of diffusion in the movement of materials between cells | | | | |
| | structural adaptations of some unicellular organisms | | | | |
| | the hierarchical organisation of multicellular organisms; cells, tissues, organs, systems | | | | |
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| Skeletal and muscular system | the structure and function of the human skeleton | | | | |
| | biomechanics – interaction between skeleton and muscles, including measurement of force exerted by muscles | | | | |
| | the function of muscles, antagonistic muscles | | | | |
| Nutrition and digestion | content of a healthy human diet and why each food group is needed | | | | |
| | calculations of energy requirements in a healthy diet | | | | |
| | consequences of imbalances in the diet | | | | |
| | the tissues and organs in the human digestive system, including adaptations to function and how the system digests food | | | | |
| | the importance of bacteria in the human digestive system | | | | |
| Gas exchange systems | plants making carbohydrates by photosynthesis in leaves and gaining minerals and water via roots | | | | |
| | the structure and functions of the gas exchange system in humans, including adaptations to function | | | | |
| | the mechanism of breathing, using a pressure model to explain gas movement | | | | |
| | the impact of exercise, asthma and smoking on | | | | |

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| | the human gas exchange system | | | | |
| | the role of leaf stomata in gas exchange in plants | | | | |
| Reproduction | reproduction in humans, including structure and function of male and female reproductive systems, menstrual cycle, gametes, fertilisation, gestation and birth | | | | |
| | reproduction in plants, including flower structure, pollination, fertilisation, seed and fruit formation and dispersal | | | | |
| Health | the effects of recreational drugs on behaviour, health and life processes | | | | |
| Material cycles and energy | | | | | |
| Photosynthesis | the reactants products, and equation for photosynthesis | | | | |
| | the dependence of almost all life on the ability of photosynthetic organisms to build organic molecules | | | | |
| | the adaptations of leaves for photosynthesis | | | | |
| Cellular respiration | aerobic and anaerobic respiration, including equations | | | | |
| | the differences between aerobic and anaerobic respiration | | | | |
| Interactions and interdependencies | | | | | |

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| Relationships in an ecosystem | the interdependence of organisms in an ecosystem including food webs | | | | |
| | the importance of plant reproduction through insect pollination in human food security | | | | |
| | how organisms affect and are affected by their environment | | | | |
| Genetics and evolution | 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 | | | | |
| | differences between species | | | | |
| | the variation between individuals within a species being continuous or discontinuous | | | | |
| | variation means some organisms compete more successfully, which can drive natural selection | | | | |
| | changes in the environment may leave some less well adapted to compete successfully which may lead to extinction | | | | |
| | the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material | | | | |
| Subject Area: | Science – Biology KS4 | | | | |

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|-------------------------|--|-----------------|-------------|------------|-----------------------------------|
| Cell biology | <ul style="list-style-type: none"> • cells as the basic structural unit of all organisms; adaptations of cells related to their functions; the main sub-cellular structures of eukaryotic and prokaryotic cells | | | | |
| | <ul style="list-style-type: none"> • stem cells in animals and meristems in plants | | | | |
| | <ul style="list-style-type: none"> • enzymes | | | | |
| | <ul style="list-style-type: none"> • factors affecting the rate of enzymatic reactions | | | | |
| | <ul style="list-style-type: none"> • the importance of cellular respiration; the processes of aerobic and anaerobic respiration | | | | |
| | <ul style="list-style-type: none"> • carbohydrates, proteins, nucleic acids and lipids as key biological molecules. | | | | |
| Transport systems | <ul style="list-style-type: none"> • the need for transport systems in multicellular organisms, including plants | | | | |
| | <ul style="list-style-type: none"> • the relationship between the structure and functions of the human circulatory system. | | | | |
| Health, disease and the | <ul style="list-style-type: none"> • the relationship between health and disease | | | | |

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| development of medicines | • communicable diseases including sexually transmitted infections in humans (including HIV/AIDs) | | | | |
| | • non-communicable diseases | | | | |
| | • bacteria, viruses and fungi as pathogens in animals and plants | | | | |
| | • body defences against pathogens and the role of the immune system against disease | | | | |
| | • reducing and preventing the spread of infectious diseases in animals and plants | | | | |
| | • the process of discovery and development of new medicines | | | | |
| | • the impact of lifestyle factors on the incidence of non-communicable diseases. | | | | |
| Coordination and control | • principles of nervous coordination and control in humans | | | | |
| | • the relationship between the structure and function of the human nervous system | | | | |
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| | <ul style="list-style-type: none"> the relationship between structure and function in a reflex arc | | | | |
| | <ul style="list-style-type: none"> principles of hormonal coordination and control in humans | | | | |
| | <ul style="list-style-type: none"> hormones in human reproduction, hormonal and non-hormonal methods of contraception | | | | |
| | <ul style="list-style-type: none"> homeostasis. | | | | |
| Photosynthesis | <ul style="list-style-type: none"> photosynthesis as the key process for food production and therefore biomass for life | | | | |
| | <ul style="list-style-type: none"> the process of photosynthesis | | | | |
| | <ul style="list-style-type: none"> factors affecting the rate of photosynthesis. | | | | |
| Ecosystems | <ul style="list-style-type: none"> levels of organisation within an ecosystem | | | | |
| | <ul style="list-style-type: none"> some abiotic and biotic factors which affect communities; the importance of interactions between organisms in a community | | | | |
| | <ul style="list-style-type: none"> how materials cycle through abiotic and biotic components of ecosystems | | | | |

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| | <ul style="list-style-type: none"> the role of microorganisms (decomposers) in the cycling of materials through an ecosystem | | | | |
| | <ul style="list-style-type: none"> organisms are interdependent and are adapted to their environment | | | | |
| | <ul style="list-style-type: none"> the importance of biodiversity | | | | |
| | <ul style="list-style-type: none"> methods of identifying species and measuring distribution, frequency and abundance of species within a habitat | | | | |
| | <ul style="list-style-type: none"> positive and negative human interactions with ecosystems. | | | | |
| Evolution, inheritance and variation | <ul style="list-style-type: none"> the genome as the entire genetic material of an organism | | | | |
| | <ul style="list-style-type: none"> how the genome, and its interaction with the environment, influence the development of the phenotype of an organism | | | | |
| | <ul style="list-style-type: none"> the potential impact of genomics on medicine | | | | |
| | <ul style="list-style-type: none"> most phenotypic features being the result of multiple, rather than single, genes | | | | |
| | <ul style="list-style-type: none"> single gene inheritance and single gene crosses with | | | | |

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| | dominant and recessive phenotypes | | | | |
| | <ul style="list-style-type: none"> sex determination in humans | | | | |
| | <ul style="list-style-type: none"> genetic variation in populations of a species | | | | |
| | <ul style="list-style-type: none"> the process of natural selection leading to evolution | | | | |
| | <ul style="list-style-type: none"> the evidence for evolution | | | | |
| | <ul style="list-style-type: none"> developments in biology affecting classification | | | | |
| | <ul style="list-style-type: none"> the importance of selective breeding of plants and animals in agriculture | | | | |
| | <ul style="list-style-type: none"> the uses of modern biotechnology including gene technology; some of the practical and ethical considerations of modern biotechnology. | | | | |
| Science – Biology KS5 | | | | | |
| 3.1 Biological Molecules | 3.1.1. Monomer and polymers | | | | |
| | 3.1.2 Carbohydrates | | | | |
| | 3.1.3 Lipids | | | | |
| | 3.1.4 Proteins | | | | |
| | 3.1.5 Nucleic acids are important information-carrying molecules | | | | |

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| | 3.1.6 ATP | | | | |
| | 3.1.7 Water | | | | |
| | 3.1.8 Inorganic Ions | | | | |
| | 3.2.1 Cell Structure | | | | |
| | 3.2.2 All cells arise from other cells | | | | |
| | 3.2.3 Transport across cell membranes | | | | |
| 3.2 Cell | 3.2.4 Cell recognition and the immune system | | | | |
| | 3.3.1 Surface area to volume ratio | | | | |
| | 3.3.2 Gas exchange | | | | |
| | 3.3.3 Digestion and absorption | | | | |
| 3.3 Organisms exchange substances with their environment | 3.3.4 Mass transport | | | | |
| | 3.4.1 DNA, genes and chromosomes | | | | |
| | 3.4.2 DNA and protein synthesis | | | | |
| | 3.4.3 Genetic diversity can arise as a result of mutation or during meiosis | | | | |
| 3.4 Genetic information, variation and relationships between organisms | 3.4.4 Genetic diversity and adaptation | | | | |

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| | 3.4.5 Species and taxonomy | | | | |
| | 3.4.6 Biodiversity within a community | | | | |
| | 3.4.7 Investigating diversity | | | | |
| | 3.5.1 Photosynthesis | | | | |
| | 3.5.2 Respiration | | | | |
| | 3.5.3 Energy and ecosystems | | | | |
| 3.5 Energy transfers in and between organisms (A-level only) | 3.5.4 Nutrient cycles | | | | |
| | 3.6.1 Stimuli, both internal and external, are detected and lead to a response | | | | |
| | 3.6.2 Nervous coordination | | | | |
| | 3.6.3 Skeletal muscles are stimulated to contract by nerves and act as effectors | | | | |
| 3.6 Organisms respond to changes in their internal and external environments (A-level only) | 3.6.4 Homeostasis is the maintenance of a stable internal environment | | | | |
| | 3.7.1 Inheritance | | | | |
| | 3.7.2 Populations | | | | |



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| | 3.7.3 Evolution may lead to speciation | | | | |
| 3.7 Genetics, populations, evolution and ecosystems | 3.7.4 Populations in ecosystems | | | | |
| | 3.8.1 Alteration of the sequence of bases in DNA can alter the structure of proteins | | | | |
| | 3.8.2 Gene expression is controlled by a number of features | | | | |
| | 3.8.3 Using genome projects | | | | |
| 3.8 The control of gene expression | 3.8.4 Gene technologies allow the study and alteration of gene function allowing a better understanding of organism function and the design of new industrial and medical processes | | | | |



Subject Knowledge Audit - Biology

Evidence of subject knowledge development

Record below the things you have **read and researched** to improve your subject knowledge in the boxes below.

| | | |
|--------|--------------------|--------------------|
| Term 1 | September/ October | November/ December |
|--------|--------------------|--------------------|

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| Term 2 | January/ February | March/ April |
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|--------|-----------|------------|
| Term 3 | May/ June | June/ July |
|--------|-----------|------------|

Please sign this sheet off at the end of the training year:

Signed: _____ (Trainee) Date: _____

Signed: _____ (Mentor) Date: _____