





	Theme	Overview of key learning to take place	How learning will be assessed
	Unit 14- Coordination and response	<p><b>14.1 Coordination and response</b></p> <ul style="list-style-type: none"><li>• I can describe the mammalian nervous system in terms of the PNS and CNS in coordination and regulation of body functions</li><li>• I can label the 3 types of neurones</li><li>• I can describe a simple reflex arc and explain its importance, and give examples of reflex actions</li><li>• I can describe the role and explain the structure and events that occur at a synapse</li></ul> <p><b>14.2 Sense organs</b></p> <ul style="list-style-type: none"><li>• I can define a sense organ and give examples</li><li>• I can label and describe the functions of the key structures of the eye</li><li>• I can explain the pupil reflex</li><li>• I can explain accommodation</li><li>• I can describe the distribution of rods and cones in the retina and the differences between them in terms of function</li></ul> <p><b>14.3 Hormones</b></p> <ul style="list-style-type: none"><li>• I can define hormones and how do they reach their target organs</li><li>• I can Identify specific endocrine glands and their secretions, limited to adrenal glands and adrenaline,</li></ul>	<p><b>Summative assessment:</b> Baseline assessment</p>  

pancreas and insulin, testes and testosterone and ovaries and oestrogen

- I can explain function of insulin, oestrogen and testosterone
- I can describe adrenaline as the hormone secreted in 'fight or flight' situations and its effects,
- I can list the effects of adrenaline release on specific organs
- I can compare nervous system and hormone control system






#### 14.4: Homeostasis

- I can recall examples of ectotherms and endotherms and how do they maintain body temperature
- I can define homeostasis and explain why it is important to maintain a constant internal environment
- I can list the organs involved in homeostasis
- I can explain the concept of control by negative feedback with reference to receptor and effector organ
- I can identify the receptor and effector organs in thermoregulation
- I can name and identify on a diagram of the skin: hairs, hair erector muscles, sweat glands, receptors, sensory neurons , blood vessels and fatty tissue
- I can explain thermoregulation as a phenomenon of negative feedback
- I can list the functions of skin and it s role in maintain constant body temperature

#### 14.5: Trophic responses

- I can describe the response of plants to gravity and light intensity in the roots and shoots and investigate this
- I can explain the role of auxin in controlling shoot growth and explain this in terms of unequal distribution and cell elongation.


Term 1	Unit 15- Drugs	<p><b>15.1: Drugs</b></p> <ul style="list-style-type: none"> <li>• I can define a drug as any substance taken into the body that modifies or affects chemical reactions in the body.</li> <li>• I can describe the use of antibiotics for the treatment of bacterial infection</li> <li>• I can state that some bacteria are resistant to antibiotics which reduces the effectiveness of antibiotics, and explain how to reduce bacterial resistance</li> <li>• I can state that antibiotics kill bacteria but do not affect viruses and explain why</li> </ul> 	<p><b>Examples of Formative Assessment to be used this term:</b></p> <p>Answers to extended answer questions peer and self assessed Homework questions/ tasks</p> <p><b>Summative assessment:</b></p> <p>Baseline assessment Mid-term assessment (Unit 15-17) End of term mock examinations (3 papers Unit 1-18)</p> 
Term 1	Unit 16- Reproduction	<p><b>16.1 Asexual reproduction</b></p> <ul style="list-style-type: none"> <li>• I can define asexual reproduction as a process resulting in the production of genetically identical offspring from one parent</li> <li>• I can identify examples of asexual reproduction from information provided</li> </ul> <p><b>16.2 Sexual reproduction</b></p> <ul style="list-style-type: none"> <li>• I can define sexual reproduction and fertilisation, with reference to haploid and diploid</li> <li>• I can discuss the advantages and disadvantages of sexual and asexual reproduction</li> </ul> <p><b>16.3 Sexual reproduction in plants</b></p> <ul style="list-style-type: none"> <li>• I can Identify and draw, using a hand lens if necessary, the sepals, petals, stamens, filaments and anthers, carpels, style, stigma, ovary and ovules, of an insect-pollinated flower</li> <li>• I can state the functions of the structures above</li> </ul> 	

- I can distinguish between the pollen grains of insect-pollinated and wind-pollinated flowers
- I can define pollination as the transfer of pollen grains from the anther to the stigma
- I can describe the structural adaptations of insect-pollinated and wind-pollinated flowers
- I can discuss the advantages and disadvantages of pollination by cross and self pollination
- I can investigate and state the environmental conditions that affect germination of seeds, limited to the requirement for water, oxygen and a suitable temperature
- I can describe the growth of the pollen tube and its entry into the ovule

#### 16.4 Sexual reproduction in humans

- I can identify and name on diagrams of the male reproductive system: the testes, scrotum, sperm ducts, prostate gland, urethra and penis, and state the functions of these parts
- I can identify and name on diagrams of the female reproductive system: the ovaries, oviducts, uterus, cervix and vagina, and state the functions of these parts
- I can describe fertilisation as the fusion of the nuclei from a male gamete (sperm) and a female gamete (egg cell/ovum) and describe the adaptive features of these cells
- I can state that in early development, the zygote forms an embryo which is a ball of cells that implants into the wall of the uterus
- I can label and describe the functions of the umbilical cord, placenta, amniotic sac and amniotic fluid



		<ul style="list-style-type: none"> <li>• I can outline the growth and development of the fetus in terms of increasing complexity in the early stages and increasing size towards the end of pregnancy</li> <li>• I can state that some pathogens and toxins can pass across the placenta and affect the foetus</li> </ul> <p><b>16.5 Sex hormones in humans</b></p> <ul style="list-style-type: none"> <li>• I can describe the roles of testosterone and oestrogen in the development and regulation of secondary sexual characteristics during puberty</li> <li>• I can describe the menstrual cycle in terms of changes in the ovaries and in the lining of the uterus and the role of the hormones in controlling the cycle</li> </ul> <p><b>16.6 Sexually transmitted infections (STIs)</b></p> <ul style="list-style-type: none"> <li>• I can define sexually transmitted infection as an infection that is transmitted via body fluids through sexual contact</li> <li>• I can state that human immunodeficiency virus (HIV) is an example of an STI</li> <li>• Explain how the spread of STIs is controlled</li> <li>• I can describe the methods of transmission of HIV</li> <li>• I can state that HIV infection may lead to AIDS</li> </ul> 	
Term 1	17. Inheritance	<p><b>17.1 Chromosomes, genes and proteins</b></p> <ul style="list-style-type: none"> <li>• I can <i>define</i> chromosome as a thread-like structure of DNA, carrying genetic information in the form of genes</li> <li>• I can <i>define</i> gene as a length of DNA that codes for a protein</li> <li>• I can <i>define</i> allele as a version of a gene</li> </ul>	

- I can describe the inheritance of sex in humans with reference to XX and XY chromosome
- I can explain how a protein is made and how DNA controls cell function
- I can identify which genes would not be expressed for specific cells
- I can define a diploid and a haploid cell



### 17.2 Mitosis


- I can define mitosis as nuclear division giving rise to genetically identical cells (details of stages are not required)
- I can state the role of mitosis in growth, repair of damaged tissues, replacement of cells and asexual reproduction
- I can describe what a stem cells is and give examples of uses for stem cells

### 17.3 Meiosis

- I can define meiosis as nuclear division giving rise to cells that are genetically different (details of stages are not required)
- I can state that meiosis is involved in the production of gametes

### 17.4 Monohybrid inheritance

- I can define inheritance, genotype and phenotype
- I can define homozygous as having two identical alleles of a particular gene
- I can state that two identical homozygous individuals that breed together will be pure-breeding
- I can define heterozygous as having two different alleles of a particular gene
- I can define dominant and recessive in terms of expression



		<ul style="list-style-type: none"> <li>• I can Interpret pedigree diagrams for the inheritance of a given characteristic</li> <li>• I can use genetic diagrams to predict the results of monohybrid crosses and calculate phenotypic ratios, limited to 1:1 and 3:1 ratios, and how test-crosses can be used</li> <li>• I can use Punnett squares in crosses which result in more than one genotype to work out and show the possible different genotypes</li> <li>• I can describe codominance, with the example of blood groups</li> <li>• I can describe sex-linked characteristics, with the example of colour blindness</li> <li>• I can use genetic diagrams to predict the results of monohybrid crosses or codominance or sex linkage</li> </ul>	
Term 1	18. Variation and selection	<p><b>18.1 Variation</b></p> <ul style="list-style-type: none"> <li>• I can define variation as differences between individuals of the same species</li> <li>• I can distinguish between continuous and discontinuous variation and investigate examples of these</li> <li>• I can state that phenotypic variation is caused by both genetic and environmental factors</li> <li>• I can define gene mutation as a change in the base sequence of DNA and state that mutation is the way in which new alleles are formed</li> <li>• I can state that mutation, meiosis, random mating and random fertilisation are sources of variation</li> <li>• I can state that ionising radiation and some chemicals increase the rate of mutation</li> </ul>  <p><b>18.2 Adaptive features</b></p>	


- I can define adaptive feature as an inherited feature that helps an organism to survive and reproduce in its environment
- I can interpret images or other information about a species to describe its adaptive features
- I can explain the adaptive features of hydrophytes and xerophytes to their environments



### 18.3 Selection

- I can describe the process of natural selection
- I can describe evolution as the change in adaptive features of a population over time as the result of natural selection
- I can define the process of adaptation as the process, resulting from natural selection, by which populations become more suited to their environment over many generations
- I can describe the development of strains of antibiotic resistant bacteria as an example of evolution by natural selection
- I can describe the process of selective breeding
- I can state the differences between natural and artificial selection
- I can outline how selective breeding by artificial selection is carried out over many generations to improve crop plants and domesticated animals



	Theme	Overview of key learning to take place	How learning will be assessed
Term 2	19. Organisms and their environment	<p><b>19.1 Energy flow</b></p> <ul style="list-style-type: none"> <li>I can state that the Sun is the principal source of energy input to biological systems</li> <li>I can define a food chain as showing the transfer of energy from one organism to the next, beginning with a producer</li> </ul>  <p><b>19.2 Food chains and food webs</b></p> <ul style="list-style-type: none"> <li>I can construct and describe simple food chains showing the transfer of energy</li> <li>I can describe a producer as an organism that makes its own organic nutrients, usually using energy from sunlight, through photosynthesis</li> <li>I can define consumer as an organism that gets its energy by feeding on other organisms</li> <li>I can state that consumers may be classed as primary, secondary and tertiary according to their position in a food chain</li> <li>I can define herbivore, carnivore and decomposer</li> <li>I can use food chains and food webs to discuss the impact humans have</li> <li>I can use food chains and food webs to describe the impacts humans have through over harvesting of food species and through introducing foreign species to a habitat</li> <li>I can draw, describe and interpret pyramids of numbers</li> <li>I can discuss the benefits of using a pyramid of biomass over a pyramid of numbers to represent a food chain</li> <li>I can describe a trophic level and identify these levels in a food chain and a pyramid</li> <li>I can suggest why and how energy is lost from one trophic level to another in terms of efficiency</li> </ul> <p><b>19.3 Nutrient cycles</b></p> <ul style="list-style-type: none"> <li>I can describe the carbon cycle</li> </ul>	<p><b>Examples of Formative Assessment to be used this term:</b></p> <p>Answers to extended answer questions peer and self assessed Homework questions/ tasks</p> <p><b>Summative assessment:</b></p> <p>Mid-term assessment (Unit 18-20) End of term mock examinations (3 papers Unit 1-21)</p> 

		<ul style="list-style-type: none"> <li>I can describe the nitrogen cycle and state the role of microorganisms</li> </ul> <p><b>19.4 Populations</b></p> <ul style="list-style-type: none"> <li>I can define population, community and ecosystem</li> <li>I can identify and state the factors affecting the rate of population growth for a population of an organism</li> <li>I can interpret graphs and diagrams of human population growth and identify and label each phase</li> <li>I can explain the factors that cause each phase in the sigmoid growth curve, including the role of limiting factors</li> </ul> 	
	<p>20.Human influences on ecosystems</p>	<p><b>20.1 Food supply</b></p> <ul style="list-style-type: none"> <li>I can describe how humans have increased food production</li> <li>I can describe the advantages and disadvantages of intensive farming and large- scale monocultures of plant crops</li> </ul> <p><b>20.2 Habitat destruction</b></p> <ul style="list-style-type: none"> <li>I can define biodiversity</li> <li>I can describe the reasons for habitat destruction,</li> <li>I can describe the effect altering food webs has on habitats</li> <li>I can list the undesirable effects of deforestation</li> </ul> <p><b>20.3 Pollution</b></p> <ul style="list-style-type: none"> <li>I can describe the process of eutrophication of water</li> <li>I can describe the effects non-biodegradable plastics have on ecosystems</li> <li>I can state the sources and effects of pollution of the air by methane and carbon dioxide</li> </ul> <p><b>20.4 Conservation</b></p> <ul style="list-style-type: none"> <li>I can define a sustainable resource</li> <li>I can explain the need to conserve non-renewable resources, specifically in terms of forests and fish stocks</li> </ul>	

		<ul style="list-style-type: none"> <li>• I can explain why organisms become endangered or extinct</li> <li>• I can describe how endangered species can be conserved and suggest reasons for conservation programmes</li> <li>• I can explain the use of IVF and AI for captive breeding and the risk to a species if population size decreases</li> </ul> 	
	<p>21. Biotechnology and genetic modification</p>	<p><b>21.1 Biotechnology and genetic modification</b></p> <ul style="list-style-type: none"> <li>• I can state and discuss how and why bacteria are useful in biotechnology and genetic modification</li> </ul> <p><b>21.2 Biotechnology</b></p> <ul style="list-style-type: none"> <li>• I can describe the role of anaerobic respiration in yeast during production of ethanol for biofuels and in bread making</li> <li>• Investigate and describe the use of pectinase in fruit juice production</li> <li>• Investigate and describe the use of biological washing powders that contain enzymes</li> <li>• I can explain the use of lactose-free milk</li> <li>• I can explain the process and conditions required for fermenters for large scale production of useful products</li> </ul> <p><b>21.3 Genetic modification</b></p> <ul style="list-style-type: none"> <li>• I can define genetic modification and describe the process</li> <li>• I can state examples of genetic modification and discuss the advantages and disadvantages of genetically modified crops.</li> <li>•</li> </ul> 	

Term 3	Unit 1-4	<b>Revision and past paper practice leading up until the examination period</b>	In class assessments- specific to students needs
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