| Paper 2 Content | | | |
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| **B10 The Human Nervous System**  **Specification pages 41-44** | **Analysis** | **Revision** | **☺** |
| Can define the term homeostasis |  |  |  |
| Can describe 3 internal conditions in the human body regulated during homeostasis |  |  |  |
| Can state 3 features of control systems in the human body which may involve nervous or chemical responses. |  |  |  |
| Can describe the role of the nervous system. |  |  |  |
| Can state what makes up the central nervous system (CNS) |  |  |  |
| Can describe the features of a neurone and explain how it is adapted to do its job |  |  |  |
| Can identify the pathway of a reflex arc from stimulus to response as a flow chart or on a diagram |  |  |  |
| Can describe why reflex arcs are important |  |  |  |
| Can describe the difference between voluntary and involuntary responses |  |  |  |
| *Can plan and carry out an investigation into the effect of a factor on human reaction time (RP7)* |  |  |  |
| BIO Can identify cerebral cortex, cerebellum and medulla and describe their functions |  |  |  |
| **BIO Can explain why it is difficult to investigate brain function and treat brain damage and disease** |  |  |  |
| **BIO Can explain how neuroscientists have been able to map parts of the brain** |  |  |  |
| BIO Can identify the main parts of the eye and describe their function. |  |  |  |
| BIO Can describe how the eye uses accommodation to focus on near and distant objects |  |  |  |
| BIO Can describe how and explain why the eye adapts to dim light |  |  |  |
| BIO Can describe the conditions myopia and hyperopia and how they are corrected |  |  |  |
| BIO Can interpret ray diagrams of eye problems and demonstrate on a diagram how spectacles correct them |  |  |  |
| **B11 Hormonal Control**  **Specification pages 45-46 and 48-50** | **Analysis** | **Revision** | **☺** |
| Can describe the role of the endocrine system |  |  |  |
| Can describe what a hormone is, where it is produced, how it travels around the body and where it produces an effect |  |  |  |
| Can state the role of the pituitary gland |  |  |  |
| Can identify where the following glands are found: pituitary, pancreas, thyroid, adrenal, ovary and testes. |  |  |  |
| Can compare and contrast messages sent by the endocrine and nervous system |  |  |  |
| Can describe where blood glucose is monitored and controlled |  |  |  |
| Can describe what insulin does and where it is released and why |  |  |  |
| Can compare Type 1 and Type 2 diabetes and explain how they are treated |  |  |  |
| Can interpret graph data showing the effect of insulin on blood glucose levels in people with or without diabetes |  |  |  |
| **Can describe the what Glucagon does and where it is released and why** |  |  |  |
| **Can explain how glucagon and insulin interact with each other in a negative feedback cycle to control blood sugar levels** |  |  |  |
| Can describe what secondary sexual characteristics are developed during puberty in males and females |  |  |  |
| Can describe where oestrogen and testosterone are released |  |  |  |
| Can state the length of the menstrual cycle |  |  |  |
| Can define the term ovulation and state when it happens during the menstrual cycle |  |  |  |
| Can describe what a period is and when it happens during the menstrual cycle |  |  |  |
| Can describe the role of FSH, LH, oestrogen and progesterone in the menstrual cycle |  |  |  |
| **Can explain how these hormones interact with each other in the control of the menstrual cycle** |  |  |  |
| **Can interpret data from graphs showing hormone levels during the menstrual cycle** |  |  |  |
| Can describe and evaluate different hormonal methods of contraception |  |  |  |
| Can describe and evaluate different non - hormonal methods of contraception |  |  |  |
| **Can explain why FSH and LH are referred to as ‘fertility drugs’** |  |  |  |
| **Can describe the process of In Vitro Fertilisation (IVF)** |  |  |  |
| **Can evaluate the benefits and problems of undergoing IVF** |  |  |  |
| **Can explain why there is an increased risk of multiple births from IVF and why this can cause problems** |  |  |  |
| **Can explain the role of thyroxin and adrenaline in the body** |  |  |  |
| **Can interpret and explain simple diagrams of negative feedback control, e.g. in Thyroxine levels** |  |  |  |
| BIO Can describe what a tropism is and describe the response of a plant in terms of phototropism and gravitropism |  |  |  |
| BIO Can describe the role of auxin and explain how it causes unequal growth rates |  |  |  |
| **BIO Can describe the roles of gibberellins and ethene in plants** |  |  |  |
| BIO *Can plan and carry out an investigation into the effect of light or gravity on the growth of newly germinated seeds (RP8)* |  |  |  |
| **BIO Can describe how we can use auxins, gibberellins and ethane in agriculture and horticulture** |  |  |  |
| **BIO Can explain why the everyday use of hormones as weedkillers has an effect on biodiversity** |  |  |  |
| **B11 Homeostasis in Action**  **Specification pages 45 and 47** | **Analysis** | **Revision** | **☺** |
| BIO Can state where body temperature is monitored |  |  |  |
| BIO Can describe ways the body can cool down if it gets too hot |  |  |  |
| BIO Can describe ways the body can heat up if it gets too cold |  |  |  |
| **BIO Can explain how these mechanisms to raise or lower body temperature work** |  |  |  |
| BIO Can describe 3 ways water can leave the body |  |  |  |
| BIO Can explain the effect on cells of osmotic changes in body fluids |  |  |  |
| **BIO Can describe the deanimation of excess amino acids into ammonia and why this is quickly converted into urea in the liver** |  |  |  |
| BIO Can describe the function of the kidneys in maintaining the water balance of the body |  |  |  |
| BIO Can describe what selective reabsorption in the kidneys is and why it happens |  |  |  |
| BIO Can translate graphical and numerical data on glucose, ions and urea before and after filtration |  |  |  |
| **BIO Can describe the effect of ADH on the permeability of the kidney tubules** |  |  |  |
| BIO Can describe how kidney dialysis works for people suffering with kidney failure |  |  |  |
| BIO Can evaluate the advantages and disadvantages of kidney transplant and dialysis |  |  |  |
| **B13 Reproduction**  **Specification pages 51-56** | **Analysis** | **Revision** | **☺** |
| Can compare and contrast mitosis and meiosis |  |  |  |
| Can state the gametes in animals and plants |  |  |  |
| Can explain why meiosis is used in the formation of gametes |  |  |  |
| Can explain how meiosis halves the number of chromosomes |  |  |  |
| Can define what fertilisation is |  |  |  |
| Can explain how fertilisation restores the full number of chromosomes |  |  |  |
| Can compare and contrast sexual and asexual reproduction |  |  |  |
| BIO Can describe the advantages and disadvantages of sexual and asexual reproduction |  |  |  |
| Can describe the structure of DNA |  |  |  |
| Can define the term genome |  |  |  |
| Can describe where DNA is found in cells |  |  |  |
| Can describe the relationship between DNA, chromosomes and genes |  |  |  |
| Can describe what a gene is and what it does |  |  |  |
| Can describe what the Human Genome Project (HGP) is |  |  |  |
| Can explain the benefits of studying the human genome |  |  |  |
| BIO Can describe the structure of a nucleotide |  |  |  |
| BIO Can state the 4 bases of DNA |  |  |  |
| BIO Can describe what a triplet code is and what it codes for |  |  |  |
| BIO Can interpret a diagram of DNA structure |  |  |  |
| **BIO Can recall a simple description of protein synthesis** |  |  |  |
| **BIO Can explain simply how the structure of DNA affects the protein made** |  |  |  |
| **BIO Can describe how genetic variants may influence phenotypes in coding DNA by altering protein activity** |  |  |  |
| **BIO Can describe how genetic variants may influence phenotypes in non-coding DNA by altering how genes are expressed** |  |  |  |
| **BIO Can state how the 4 bases pair up** |  |  |  |
| **BIO Can explain how a change in the DNA structure may result in the change of the protein produced** |  |  |  |
| **BIO Can state where proteins are made in cells** |  |  |  |
| **BIO Can describe why completed protein chains are folded up into unique shapes** |  |  |  |
| **BIO Can explain what a mutation is and when they happen** |  |  |  |
| **BIO Can explain why a mutation can lead to an enzyme that no longer fits it’s substrate** |  |  |  |
| **BIO Can describe what non-coding parts of DNA do and why they are important** |  |  |  |
| **BIO Can model insertions and deletions in chromosomes to illustrate mutations** |  |  |  |
| Can define the terms: gamete, chromosome, gene, allele |  |  |  |
| Can define the terms: dominant, recessive, homozygous, heterozygous, genotype and phenotype. All in relation to inheritance |  |  |  |
| Can describe characteristics that are the result of multiple genes or single genes |  |  |  |
| Can predict the outcome of genetic crosses by using simple ratios and direct proportion |  |  |  |
| Can explain why using Punnett squares to predict the outcome of genetic crosses is limited |  |  |  |
| Can extract and interpret information from family trees and genetic crosses to complete Punnett square diagrams |  |  |  |
| **Can construct Punnett squares and use them to make predictions using theories of probability** |  |  |  |
| Can describe what an inherited disorder is |  |  |  |
| Can describe the genetic diseases Polydactyly and Cystic Fibrosis and describe how they are caused |  |  |  |
| Can describe the benefits and drawbacks of genetic screening for the above conditions |  |  |  |
| Can state the sex chromosomes in males and females |  |  |  |
| Can carry out a genetic cross to show sex inheritance |  |  |  |
| **B14 Variation and Evolution**  **Specification pages 57-60** | **Analysis** | **Revised** | **☺** |
| Can describe that the phenotype of an organism is developed from a combination of the genome and the influence of the environment and give examples |  |  |  |
| Can define the term variation |  |  |  |
| Can describe how variation arises through mutations |  |  |  |
| Can identify when a mutation will have a positive/negative/no effect on the organism |  |  |  |
| Can define the term evolution |  |  |  |
| Can describe the theory of natural selection |  |  |  |
| Can describe the process of selective breeding in both animals and plants |  |  |  |
| Can explain the benefits and risks of selective breeding |  |  |  |
| Can give examples of the ways humans have selectively bred organisms in farming, agriculture and horticulture |  |  |  |
| Can define genetic engineering and give an example in plants and bacterial cells on how it has been useful |  |  |  |
| Can explain the benefits and risks of genetic engineering |  |  |  |
| Can describe the process of genetic engineering simply |  |  |  |
| Can describe what a GM crop is |  |  |  |
| **Can describe the main steps in genetic engineering using the words; enzyme, plasmid, vector and gene** |  |  |  |
| BIO Can describe what tissue culture is and why it is a useful technique |  |  |  |
| BIO Can describe what cutting is |  |  |  |
| BIO Can describe the process of embryo transplants |  |  |  |
| BIO Can describe the process of adult cell cloning |  |  |  |
| **B15 Genetics and Evolution**  **Specification pages 61-65** | **Analysis** | **Revised** | **☺** |
| BIO Can describe how Darwin came up with his theory of natural selection |  |  |  |
| BIO Can describe how other scientists influenced Darwin prior to him formulating his theory |  |  |  |
| BIO Can name the book Darwin published in 1859 and suggest why it was so controversial |  |  |  |
| BIO Can describe some of the evidence Darwin had to support his theory at the time of publishing his book |  |  |  |
| BIO Can describe later evidence we now have that Darwin did not that further supports his theory of natural selection |  |  |  |
| BIO Can describe the theory put forward by Jean-Baptiste Lamarck and compare how it differs to Darwin’s |  |  |  |
| BIO Can describe why Alfred Russel Wallace prompted Darwin to publish his book |  |  |  |
| BIO Can define what a species is |  |  |  |
| BIO Can describe Wallace’s theory of speciation and how new species are formed |  |  |  |
| BIO Can describe the work of Gregor Mendel and describe it’s impact on our understanding of genetics |  |  |  |
| BIO Can explain why the importance of Mendel’s discoveries was not recognised until after his death |  |  |  |
| Can describe what a fossil is and how they are formed |  |  |  |
| Can explain why we do not have much evidence of early forms of life |  |  |  |
| Can explain how the fossil record provides evidence for evolution |  |  |  |
| Can define the term extinction |  |  |  |
| Can describe factors which can contribute to the extinction of a species |  |  |  |
| Can explain why bacteria evolve quickly |  |  |  |
| Can describe how antibiotic resistance develops through natural selection |  |  |  |
| Can explain how antibiotic resistance in bacteria provides evidence for evolution |  |  |  |
| Can describe what MRSA is |  |  |  |
| Can describe ways to slow down the evolution of antibiotic resistant bacteria |  |  |  |
| Can explain why we classify organisms |  |  |  |
| Can describe Carl Linnaeus’ classification system: KPCOFGS |  |  |  |
| Can explain what the binomial system of naming organisms is |  |  |  |
| Can explain why classification systems have developed over the years since Linnaeus |  |  |  |
| Can describe the ‘three-domain system’ by Carl Woese |  |  |  |
| Can interpret evolutionary trees to extract information about how organisms have changed over time |  |  |  |
| **B16 Adaptation, Interdependence and Competition**  **Specification pages 66-68** | **Analysis** | **Revised** | **☺** |
| Can define the terms: organism, habitat, population, community and ecosystem and suggest how they relate to each other |  |  |  |
| Can state factors organisms will compete for in a habitat |  |  |  |
| Can define the term interdependence and why it is important in a community of organisms |  |  |  |
| Can describe what an abiotic factor is and give examples |  |  |  |
| Can describe what a biotic factor is and give examples |  |  |  |
| Can identify and explain adaptations organisms have for the habitat they live in |  |  |  |
| Can describe whether an adaptation is behavioural, structural or functional |  |  |  |
| Can describe what an extremophile is and give an example |  |  |  |
| **B17 Organising an Ecosystem**  **Specification pages 68-69** | **Analysis** | **Revised** | **☺** |
| Can define the term producer in a food chain |  |  |  |
| Can define the term primary, secondary and tertiary consumer and identify them in food chains |  |  |  |
| Can interpret predator-prey cycle graphs and describe what is happening at different points |  |  |  |
| Can describe how to use a quadrat to determine the distribution and abundance of species in an area |  |  |  |
| Can describe how to use a transect to determine the distribution and abundance of species in an area |  |  |  |
| Can calculate mean, median and mode for sampling data from quadrats and transects |  |  |  |
| *Can measure population size using sampling techniques and plan an investigation into the effect of a factor on species distribution (RP9)* |  |  |  |
| Can describe the main stages of the water cycle |  |  |  |
| Can describe how carbon is cycled and the role of plants, animals and microorganisms in this |  |  |  |
| Can interpret and explain processes in diagrams of the carbon and water cycles |  |  |  |
| BIO Can explain how temperature, water and oxygen availability affect the rate of decay |  |  |  |
| BIO Can calculate rate changes of decay |  |  |  |
| BIO Can plot graphs showing rates of decay and select appropriate scales and axes |  |  |  |
| BIO Can describe what composting is and suggest how the optimum conditions for decay are provided by farmers and gardeners |  |  |  |
| BIO Can describe what gas anaerobic decay produces and how we can use it in biogas generators |  |  |  |
| *BIO Can plan an investigation into the effect of temperature on the rate of decay of fresh milk by measuring pH change (RP10)* |  |  |  |
| **BIO Can evaluate the impact of temperature changes, availability of water and composition of atmospheric gases on the distribution of species** |  |  |  |
| **BIO Can identify whether these changes are seasonal, geographic or caused by human interaction** |  |  |  |
| **B18 Biodiversity and Ecosystems**  **Specification pages 70-75** | **Analysis** | **Revised** | **☺** |
| Can define the term biodiversity |  |  |  |
| Can explain why having high biodiversity in an ecosystem is important in keeping it stable |  |  |  |
| Can describe the human activities that have a negative impact on global biodiversity |  |  |  |
| Can describe what steps we can take to reduce this negative impact |  |  |  |
| Can describe the impact on resources that a rapidly growing human population will have and why levels of pollution will increase |  |  |  |
| Can describe how pollution occurs in water, on land and in the air |  |  |  |
| Can explain how pollution reduces biodiversity |  |  |  |
| Can explain how humans reduce the amount of land available to other organisms |  |  |  |
| Can describe what a peat bog is |  |  |  |
| Can explain how the burning of peat as a fuel contributes to global warming |  |  |  |
| Can describe what deforestation is and why it happens |  |  |  |
| Can explain how deforestation can contribute to global warming |  |  |  |
| Can describe what some of the biological consequences of global warming can be |  |  |  |
| Can explain why global warming is not fully accepted as a theory by everyone |  |  |  |
| Can describe ways in which humans attempt to conserve high levels of biodiversity |  |  |  |
| Can explain why humans should try to conserve high levels of biodiversity |  |  |  |
| BIO Can describe what trophic levels are in a food chain |  |  |  |
| BIO Can describe what an apex predator is |  |  |  |
| BIO Can describe how decomposers break down dead plant and animal matter |  |  |  |
| BIO Can describe what a pyramid of biomass represents |  |  |  |
| BIO Can construct accurate pyramids of biomass from data |  |  |  |
| BIO Can explain how biomass is lost between different trophic levels |  |  |  |
| BIO Can explain why only 1% of light energy that hits the Earth is transferred into food chains |  |  |  |
| BIO Can explain why only about 10% of biomass is transferred on to the next trophic level |  |  |  |
| BIO Can calculate efficiency of biomass transfers |  |  |  |
| BIO Can link this efficiency to explain how it effects the numbers of organisms at each trophic level |  |  |  |
| BIO Can define the term food security |  |  |  |
| BIO Can describe biological factors that threaten food security around the world |  |  |  |
| BIO Can explain why sustainable methods of food production must be used |  |  |  |
| BIO Can describe what intensive farming is and how it reduces energy transfer into the environment |  |  |  |
| BIO Can evaluate modern farming techniques and describe why people may object to them ethically |  |  |  |
| BIO Can explain why it is important to maintain fish stocks |  |  |  |
| BIO Can explain how humans can help maintain fish stocks |  |  |  |
| BIO Can describe how we could use genetic modification to meet the demands of a growing human population |  |  |  |
| BIO Can describe how to produce mycoprotein and how this could provide food |  |  |  |