

## Paper 2 Content

B10 The Human Nervous System	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		
<i>Can plan and carry out an investigation into the effect of a factor on human reaction time (RP7)</i>		
BIO Can identify cerebral cortex, cerebellum and medulla and describe their functions		
<b>BIO Can explain why it is difficult to investigate brain function and treat brain damage and disease</b>		
<b>BIO Can explain how neuroscientists have been able to map parts of the brain</b>		
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	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		
<b>Can describe the what Glucagon does and where it is released and why</b>		
<b>Can explain how glucagon and insulin interact with each other in a negative feedback cycle to control blood sugar levels</b>		

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		
<b>Can explain how these hormones interact with each other in the control of the menstrual cycle</b>		
<b>Can interpret data from graphs showing hormone levels during the menstrual cycle</b>		
Can describe and evaluate different hormonal methods of contraception		
Can describe and evaluate different non - hormonal methods of contraception		
<b>Can explain why FSH and LH are referred to as 'fertility drugs'</b>		
<b>Can describe the process of In Vitro Fertilisation (IVF)</b>		
<b>Can evaluate the benefits and problems of undergoing IVF</b>		
<b>Can explain why there is an increased risk of multiple births from IVF and why this can cause problems</b>		
<b>Can explain the role of thyroxin and adrenaline in the body</b>		
<b>Can interpret and explain simple diagrams of negative feedback control, e.g. in Thyroxine levels</b>		
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		
<b>BIO Can describe the roles of gibberellins and ethene in plants</b>		
BIO Can plan and carry out an investigation into the effect of light or gravity on the growth of newly germinated seeds (RP8)		
<b>BIO Can describe how we can use auxins, gibberellins and ethane in agriculture and horticulture</b>		
<b>BIO Can explain why the everyday use of hormones as weedkillers has an effect on biodiversity</b>		
<b>B11 Homeostasis in action</b>	<b>Analysis</b>	<b>Revision</b>
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		
<b>BIO Can explain how these mechanisms to raise or lower body temperature work</b>		
BIO Can describe 3 ways water can leave the body		
BIO Can explain the effect on cells of osmotic changes in body fluids		
<b>BIO Can describe the deamination of excess amino acids into ammonia and why this is quickly converted into urea in the liver</b>		
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		

<b>BIO Can describe the effect of ADH on the permeability of the kidney tubules</b>		
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		
<b>B13 Reproduction</b>	<b>Analysis</b>	<b>Revision</b>
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 define what fertilisation is		
Can explain how meiosis halves the number of chromosomes and 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 explain how meiosis halves the number of chromosomes and fertilisation restores the full number of chromosomes		
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		
<b>BIO Can recall a simple description of protein synthesis</b>		
<b>BIO Can explain simply how the structure of DNA affects the protein made</b>		
<b>BIO Can describe how genetic variants may influence phenotypes in coding DNA by altering protein activity</b>		
<b>BIO Can describe how genetic variants may influence phenotypes in non-coding DNA by altering how genes are expressed</b>		
<b>BIO Can state how the 4 bases pair up</b>		
<b>BIO Can explain how a change in the DNA structure may result in the change of the protein produced</b>		
<b>BIO Can state where proteins are made in cells</b>		
<b>BIO Can describe why completed protein chains are folded up into unique shapes</b>		
<b>BIO Can explain what a mutation is and when they happen</b>		
<b>BIO Can explain why a mutation can lead to an enzyme that no longer fits it's substrate</b>		

<b>BIO Can describe what non-coding parts of DNA do and why they are important</b>		
<b>BIO Can model insertions and deletions in chromosomes to illustrate mutations</b>		
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		
<b>Can construct Punnett squares and use them to make predictions using theories of probability</b>		
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		
<b>B14 Variation and Evolution</b>	<b>Analysis</b>	<b>Revised</b>
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		
<b>Can describe the main steps in genetic engineering using the words; enzyme, plasmid, vector and gene</b>		
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		

<b>B15 Genetics and Evolution</b>	<b>Analysis</b>	<b>Revised</b>
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 its 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		
<b>B16 Adaptation, Interdependence and Competition</b>	<b>Analysis</b>	<b>Revised</b>
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		
<b>B17 Organising an Ecosystem</b>	<b>Analysis</b>	<b>Revised</b>
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		
<i>Can measure population size using sampling techniques and plan an investigation into the effect of a factor on species distribution (RP9)</i>		
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		
<i>BIO Can plan an investigation into the effect of temperature on the rate of decay of fresh milk by measuring pH change (RP10)</i>		
<b>BIO Can evaluate the impact of temperature changes, availability of water and composition of atmospheric gases on the distribution of species</b>		
<b>BIO Can identify whether these changes are seasonal, geographic or caused by human interaction</b>		
<b>B18 Biodiversity and Ecosystems</b>	<b>Analysis</b>	<b>Revised</b>
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		