### AQA TRILOGY Biology (8464) from 2016 Topic T4.5 Homeostasis and response

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<th>Topic</th>
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<tr>
<td><strong>4.5.1 Homeostasis</strong></td>
<td>Describe what homeostasis is and why it is important stating specific examples from the human body</td>
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<td>Describe the common features of all control systems</td>
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<td><strong>4.5.2 The human nervous system</strong></td>
<td>State the function of the nervous system and name its important components</td>
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<td>Describe how information passes through the nervous system</td>
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<td>Describe what happens in a reflex action and why reflex actions are important</td>
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<td></td>
<td>Explain how features of the nervous system are adapted to their function, including a reflex arc (inc all types of neurone and the synapse)</td>
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<td><em>Required practical 7: plan and carry out an investigation into the effect of a factor on human reaction time</em></td>
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<td><strong>4.5.3 Hormonal coordination in humans</strong></td>
<td>Describe the endocrine system, including the location of the pituitary, pancreas, thyroid, adrenal gland, ovary and testis and the role of hormones</td>
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<td>State that blood glucose concentration is monitored and controlled by the pancreas</td>
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<td>Describe the body's response when blood glucose concentration is too high</td>
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<td>Explain what type 1 and type 2 diabetes are and how they are treated</td>
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<td><em>HT ONLY: Describe the body's response when blood glucose concentration is too low</em></td>
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<td><em>HT ONLY: Explain how glucagon interacts with insulin to control blood glucose levels in the body</em></td>
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<td>Describe how water, ions and urea are lost from the body</td>
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<td><em>HT ONLY: Recall that protein digestion leads to excess amino acids inside the body and describe what happens to these</em></td>
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<td>Describe how the kidneys produce urine</td>
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<td><em>HT ONLY: Describe the effect of ADH on the permeability of the kidney tubules and explain how the water level in the body is controlled by ADH</em></td>
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<td>Describe how kidney failure can be treated by organ transplant or dialysis and recall the basic principles of dialysis</td>
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<td>Describe what happens at puberty in males and females, inc knowledge of reproductive hormones</td>
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<td>Describe the roles of the hormones involved in the menstrual cycle (FSH, LH and oestrogen)</td>
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<td><em>HT ONLY: Explain how the different hormones interact to control the menstrual cycle and ovulation</em></td>
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<td>Describe how fertility can be controlled by hormonal and non-hormonal methods of contraception (giving specific examples from the spec)</td>
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<td><em>HT ONLY: Explain how hormones are used to treat infertility, inc the steps in IVF</em></td>
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<td><em>HT ONLY: Evaluate the risks and benefits of fertility treatments</em></td>
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<td><em>HT ONLY: Describe the functions of adrenaline and thyroxine in the body, and recall where they are produced</em></td>
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<td><em>HT ONLY: Explain the roles of thyroxine and adrenaline in the body as negative feedback systems</em></td>
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<td><strong>4.5.4 Plant hormones</strong></td>
<td><em>Required practical 8: investigate the effect of light or gravity on the growth of newly germinated seedling</em></td>
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<td><em>HT ONLY: Explain the use of plant growth hormones are used in agriculture and horticulture (auxins, ethene and gibberellins)</em></td>
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<td>4.6.1 Reproduction</td>
<td>Describe features of sexual and asexual reproduction</td>
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<td>Describe what happens during meiosis and compare to mitosis</td>
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<td>Describe what happens at fertilisation</td>
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<td>Describe the structure of DNA and its role in storing genetic information inside the cell</td>
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<td>Explain the term 'genome' and the importance of the human genome (specific examples from spec only)</td>
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<td>Describe how characteristics are controlled by one or more genes, including examples</td>
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<td>Explain important genetic terms: gamete, chromosome, gene, allele, genotype, phenotype, dominant, recessive, homozygous and heterozygous</td>
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<td>Explain and use Punnet square diagrams, genetic crosses and family trees</td>
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<td>HT ONLY: Construct Punnet square diagrams to predict the outcomes of a monohybrid cross</td>
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<td>Describe cystic fibrosis and polydactyly as examples of inherited disorders</td>
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<td>Evaluate social, economic and ethical issues concerning embryo screening when given appropriate information</td>
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<td>Describe how the chromosomes are arranged in human body cells, including the function of the sex chromosomes</td>
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<td>Explain how sex is determined and carry out a genetic cross to show sex inheritance</td>
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<td>4.6.2 Variation and evolution</td>
<td>Describe what variation is and how it can be caused within a population</td>
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<td>Describe mutations and explain their influence on phenotype and changes in a species</td>
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<td>Explain the theory of evolution by natural selection</td>
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<td>Describe what selective breeding is</td>
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<td>Explain the process of selective breeding, including examples of desired characteristics and risks associated with selective breeding</td>
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<td>Describe what genetic engineering is, including examples, and how it is carried out</td>
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<td>Explain some benefits, risks and concerns related to genetic engineering</td>
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<td>HT ONLY: Explain the process of genetic engineering, to include knowledge of enzymes and vectors</td>
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<td>4.6.3 The development of understanding of</td>
<td>Describe some sources of evidence for evolution</td>
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<td>Describe what fossils are, how they are formed and what we can learn from them</td>
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<td>Explain why there are few traces of the early life forms, and the consequences of this in terms of our understanding of how life began</td>
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<td>Describe some of the causes of extinction</td>
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<td>Describe how antibiotic-resistant strains of bacteria can arise and spread (inc MRSA)</td>
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<td>Describe how the emergence of antibiotic-resistant bacteria can be reduced and controlled, to include the limitations of antibiotic development</td>
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<td>4.6.4 Classification</td>
<td>Describe how organisms are named and classified in the Linnaean system</td>
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<td>Describe and interpret evolutionary trees</td>
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<td>Explain how scientific advances have led to the proposal of new models of classification, inc three-domain system</td>
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### AQA TRILOGY Biology (8464) from 2016 Topic T4.7 Ecology

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<tr>
<td>4.7.1 Adaptations, interdependence and competition</td>
<td>Recall what an ecosystem is&lt;br&gt;Describe which resources animals and plants compete for, and why they do this&lt;br&gt;Define the terms 'interdependence' and 'stable community'&lt;br&gt;Name some abiotic and biotic factors that affect communities&lt;br&gt;Explain how a change in an abiotic or biotic factor might affect a community&lt;br&gt;Describe the structural, behavioural and functional adaptations of organisms&lt;br&gt;Define what an extremophile is</td>
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<td>4.7.2 Organisation of an ecosystem</td>
<td>Represent the feeding relationships within a community using a food chain and describe these relationships&lt;br&gt;Explain how and why ecologists use quadrats and transects&lt;br&gt;Describe and interpret predator-prey cycles&lt;br&gt;&lt;i&gt;Required practical 9: measure the population size of a common species in a habitat. Use sampling to investigate the effect of one factor on distribution&lt;/i&gt;&lt;br&gt;Describe the processes involved in the carbon cycle&lt;br&gt;Describe the processes involved in the water cycle</td>
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<td>4.7.3 Biodiversity and the effect of human interaction on ecosystems</td>
<td>Describe what biodiversity is, why it is important, and how human activities affect it&lt;br&gt;Describe the impact of human population growth and increased living standards on resource use and waste production&lt;br&gt;Explain how pollution can occur, and the impacts of pollution&lt;br&gt;Describe how human activities reduce the amount of land available for other animals and plants&lt;br&gt;Explain the consequences of peat bog destruction&lt;br&gt;Describe what deforestation is and why it has occurred in tropical areas&lt;br&gt;Explain the consequences of deforestation&lt;br&gt;Describe how the composition of the atmosphere is changing, and the impact of this on global warming&lt;br&gt;Describe some biological consequences of global warming&lt;br&gt;Describe both positive and negative human interactions in an ecosystem and explain their impact on biodiversity&lt;br&gt;Describe programmes that aim to reduce the negative effects of humans on ecosystems and biodiversity</td>
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