

Year 13: Teacher A

All numbers refer to specification points

Timing	Unit Title	Key Question	Knowledge	Assessing understanding
Autumn	3.6 Organisms respond to changes in their internal and external environments 3.6.1 Stimuli, both internal and external, are detected and lead to a response 3.6.2 Nervous coordination	How does our nervous system work?	• A stimulus is a change in the internal or external environment. A receptor detects a stimulus. A coordinator formulates a suitable response to a stimulus. An effector produces a response. • Receptors are specific to one type of stimulus. • Nerve cells pass electrical impulses along their length. A nerve impulse is specific to a target cell only because it releases a chemical messenger directly onto it, producing a response that is usually rapid, short-lived and localised. Specification references: 3.6.1.1 – 3.6.2	How understanding is assessed Students will be assessed on their ability to: • Recall the knowledge covered • Explain the Biological processes covered. • Interpret graphical and experimental data, • Make connections between different areas of understanding. Skills • Description • Explanation • Evaluation • Comparison • Planning and carrying out investigations • Carrying out statistical tests and applying maths formulae Students will also be assessed on their ability to effectively carry out the following: Required practical 10. Investigation into the effect of an environmental variable on the movement of an animal using either a choice chamber or a maze
Autumn 2	3.6.3 Skeletal muscles are stimulated to	How do our muscles work?	• Muscles act in antagonistic pairs against an incompressible skeleton. • Gross and microscopic structure of skeletal muscle. The ultrastructure of a myofibril.	How understanding is assessed Students will be assessed on their ability to: • Recall the knowledge covered

Spring 1	contract by nerves and act as effectors 3.6.4 Homeostasis is the maintenance of a stable internal environment 3.6.4 Homeostasis is the maintenance of a stable internal environment	• The roles of actin, myosin, calcium ions and ATP in myofibril contraction. • The roles of calcium ions and tropomyosin in the cycle of Action myosin bridge formation. • The roles of ATP and phosphocreatine in muscle contraction. • The structure, location and general properties of slow and fast skeletal muscle fibres. • Mammalian hormones stimulate their target cells via the blood system. They are specific to the tertiary structure of receptors on their target cells and produce responses that are usually slow, long-lasting and widespread. • Plants control their response using hormone-like growth substances. Specification references: 3.6.4.1 / 3.6.4.2/ 3.6.4.3/	• Explain the Biological processes covered. • Interpret graphical and experimental data, • Make connections between different areas of understanding. Skills • Description • Explanation • Evaluation • Comparison • Carrying out statistical tests and applying maths formulae <i>Jan mocks – everything up to and including muscles</i> Students will also be assessed on their ability to effectively carry out the following: Required practical 11. Production of a dilution series of a glucose solution and use of colorimetric techniques to produce a calibration curve with which to identify the concentration of glucose in an unknown 'urine' sample
Spring 2	3.8.3 -3.8.4 using genome projects and gene technology	• Sequencing projects have read the genomes of a wide range of organisms, including humans. • Determining the genome of simpler organisms allows the sequences of the proteins that derive from the genetic code (the proteome) of the	How understanding is assessed Students will be assessed on their ability to: • Recall the knowledge covered • Explain the Biological processes covered.

			organism to be determined. This may have many applications, including the identification of potential antigens for use in vaccine production. • In more complex organisms, the presence of non-coding DNA and of regulatory genes means that knowledge of the genome cannot easily be translated into the proteome. • Recombinant DNA technology involves the transfer of fragments of DNA from one organism, or species, to another. • Fragments of DNA can be produced by several methods. • Fragments of DNA can be amplified by <i>in vitro</i> and <i>in vivo</i> techniques. • The principles of the polymerase chain reaction (PCR) as an <i>in vitro</i> method to amplify DNA fragments. • Students will spend the rest of the summer term preparing for the essay question and revising the course material	• Interpret graphical and experimental data, • Make connections between different areas of understanding. Skills • Description • Explanation • Evaluation • Comparison • Planning and carrying out investigations • Carrying out statistical tests and applying maths formulae
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