

Curriculum Mapping

Level 3 Extended Certificate in Applied Science - KS5 Y13

Students follow AQA Level 3 Extended Certificate in Applied Science (1777)

<https://filestore.aqa.org.uk/resources/science/specifications/AQA-1775-SP-2016.PDF>

HT1	<p>Unit 5 Investigative Science (ASC5) – Student Specific</p> <ul style="list-style-type: none">• Use secondary sources to research a scientific topic and develop an outline for the practical investigation• Plan the practical investigation and justify the approaches suggested• Prepare risk assessments and carry out the practical investigation• Record data in an appropriate format• Analyse data to draw conclusions• Evaluate the techniques used and the outcomes achieved• Produce a scientific report on their investigation• Prepare a presentation of their investigation for an appropriate audience.
HT2	<p>Unit 3: Science in the modern world (ASC3)</p> <ul style="list-style-type: none">• Topical scientific issues obtained from a variety of media sources• The public perception of science and the influence that the media have• The ethical, moral, commercial, environmental, political and social issues involved in scientific advances, and how these are represented in the media• The roles and responsibilities that science personnel carry out in the science industry <p>Unit 6A: Microbiology (ASC6A)</p> <p><i>The main groups of microorganisms in terms of their structure and function</i></p> <ul style="list-style-type: none">• Characteristic structural features of akaryotes, prokaryotes and eukaryotes• Relate structural features of akaryotes, prokaryotes and eukaryotes to their function• Identify microorganisms using Gram Staining, microscopy and colony characteristics• Relating techniques used to identify microorganisms to their structure• Identification techniques used in biotechnological industries. <p><i>Using aseptic techniques to safely cultivate microorganisms</i></p> <ul style="list-style-type: none">• preparation of sterile growth media for use in cultivating microorganisms• Importance of risk assessments in the safe cultivation of microorganisms• Appropriate aseptic techniques used to cultivate a range of microorganisms, including safe disposal of microorganisms and equipment• Inoculation of media using techniques including streak, lawn and pour plates, mycelial discs and viral plaque counts
HT3	<p>Unit 3: Science in the modern world (ASC3) continued in preparation for external exam January</p> <p>Unit 6A: Microbiology (ASC6A)</p> <p><i>Using practical techniques to investigate factors that affect the growth of microorganisms</i></p> <ul style="list-style-type: none">• factors affecting the growth of microorganisms• Determine how factors affect growth, using counting and measuring techniques <p><i>Use of a range of microorganisms in biotechnological industries</i></p> <ul style="list-style-type: none">• The main features of an industrial fermenter (bioreactor)

- The use of industrial fermenters in biotechnological industries
- Industrial processes and techniques
- The use of microorganisms in a range of biotechnological industries

Unit 4: The Human Body (ASC4)

The digestive system and diet

- Key components of the digestive system and their roles
- Condensation and hydrolysis reactions in the bond-making and bond-breaking of biological compounds
- The roles of hydrochloric acid, bile and mucus in the digestive system
- The roles of enzymes in the digestion of carbohydrates, proteins and lipids
- The role of the small intestine in absorption
- The process of co-transport used to absorb glucose and amino acids
- The uses of macronutrients and micronutrients in the body
- The symptoms of deficiency of these macronutrients and micronutrients
- Foods that can help to maintain healthy levels of macronutrients and micronutrients
- Diseases/disorders that can develop from deficiency of these macronutrients and micronutrients and their symptoms.

HT4 **Unit 4: The Human Body (ASC4)**

The musculoskeletal system and movement

- Structure and function of the skeleton
- Processes in bone remodelling
- Structure, functions and types of synovial joints
- The main features of a myofibril
- The sliding filament theory for muscle contraction
- fast-twitch (white), slow-twitch (red) fibres and their adaptations
- The effect of exercise on the proportion of fast-twitch and slow-twitch muscle fibres
- Possible adaptations of diet for athletes in training, including the use of creatine supplements.

How oxygen is transported in the blood and how physiological measurements can be applied

- The structure of haemoglobin and its role
- How the degree of oxygenation depends on the partial pressure of oxygen $p(O_2)$
- Oxygen dissociation curves
- The Bohr effect
- How training at high altitudes affects oxygen transportation
- How to use a pulse oximeter to measure oxygen saturation as a non-invasive method
- The normal range for oxygen saturation levels (95 – 99 %)
- Using SaO_2 % to represent oxygen saturation
- The effect of diseases on oxygen saturation levels
- How to use a sphygmomanometer to measure blood pressure
- The effect of high/low blood pressure on health.

The structure and function of the nervous system and brain

- The organisation of the nervous system into CNS and PNS
- The somatic and autonomic nervous systems, and the difference in their roles
- The sympathetic and parasympathetic nervous systems and their roles
- The lobes of the cerebral cortex, cerebellum and brain stem and their roles
- How brain damage may result in symptoms that indicate the area of the brain that has been affected.

	<p><i>Nerve impulses</i></p> <ul style="list-style-type: none">• Structure of sensory and motor nerves• Action potential• Components of a synapse and the sequence of events across the synapse• The role of different neurotransmitters• Disorders arising from problems with neurotransmitters and synaptic transmission• The symptoms of Alzheimer's, Parkinson's and depression• The effects on synaptic transmission of drugs used to treat disorders
HT5	<p>Continuation of term 4 work if required</p> <p>Revise / recap / review topics in preparation for external examination</p>