



Year 10 Combined Science Trilogy: Biology Curriculum map

Exam Board AQA

<b>Topic</b>	<b>Key Knowledge</b> <i>What will all students KNOW by the end of the topic?</i>	<b>Key Skills</b> <i>What key skills will be learnt/developed by the end of the topic? What will all students be able to DO by the end of the topic?</i>	<b>Assessment Opportunities</b> <i>What are the key pieces of assessment? How will students be assessed?</i>
<b>Cells recap and Transport in Cells</b>	<ul style="list-style-type: none"> <li>-Review of cell structure and microscopy required practical</li> <li>- How substances are transported in and out of cells by diffusion (recap) osmosis and active transport.</li> <li>-Osmosis required practical</li> <li>- Specific examples of where these processes occur within organisms.</li> </ul>	<ul style="list-style-type: none"> <li>- Build on experimental skills with Compulsory Practical 1 (Use a light microscope to observe, draw and label plant and animal cells) - Build on microscopy skills from Yr 7 and Yr 9.</li> <li>- Recognise, draw and interpret diagrams modelling diffusion, osmosis and active transport.</li> <li>- Calculate SA:Vol</li> <li>- Build on experimental skills with Compulsory Practical 2 (Investigate the effect of a range of concentrations of sugar solution on the mass of plant tissue)</li> <li>- Recognise and use expressions in decimal form.</li> <li>- Calculate percentage change</li> <li>- Plot, draw and interpret appropriate graphs on osmosis</li> </ul>	<ul style="list-style-type: none"> <li>-Required practical 1 ability to carry out practical safely and review questions</li> <li>- starter tasks interleaving previous knowledge from last lesson/ year 9 content retrieval</li> <li>- PPQ</li> <li>-AfL throughout lessons</li> <li>-Required practical 2 analysis questions</li> <li>-Assessment 1</li> <li>-Assessment 2</li> <li>-Mocks</li> <li>-Calculations of percentage change and graph analysis</li> </ul>
<b>Bioenergetics</b>	<ul style="list-style-type: none"> <li>- Photosynthesis – chemical equation, knowledge of reactants and products.</li> <li>- Limiting factors of photosynthesis</li> <li>- Experimental evidence of photosynthesis</li> <li>- Apply knowledge to growing plants in greenhouses.</li> <li>- Use of glucose by plants</li> <li>- Respiration – chemical equation, knowledge of reactants and products.</li> <li>- Process and site of aerobic respiration</li> </ul>	<ul style="list-style-type: none"> <li>-Build on experimental skills with Compulsory Practical 5 (Effect of light intensity on the rate of photosynthesis)</li> <li>-Plan an experiment from a list of equipment</li> <li>-Measure and calculate rate using appropriate apparatus and technique.</li> <li>-Extract and interpret graphs</li> <li>-Continue to develop graph drawing skills. Understand and use inverse proportion.</li> </ul>	<ul style="list-style-type: none"> <li>-Homework</li> <li>-Accurate results collected from photosynthesis required practical</li> <li>-Quizzes</li> <li>-PPQ</li> <li>-Review of practical looking into the changes experienced from anaerobic respiration</li> </ul>

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	<ul style="list-style-type: none"> <li>- Uses of energy</li> <li>- Process of anaerobic respiration in animal cells, yeast and plant cells.</li> <li>- Compare aerobic and anaerobic respiration.</li> <li>- Effects of exercise on the body</li> <li>- What is meant by 'metabolism'</li> </ul>	<ul style="list-style-type: none"> <li>-Continue to develop ability to analyse and evaluate data.</li> <li>-Interpret data on heart rate, breathing rate and changes because of exercise and the rate of respiration.</li> </ul>	<ul style="list-style-type: none"> <li>-Evaluation question (6 marks) to describe and explain changes observed by the body after exercise</li> <li>-AfL throughout lessons</li> <li>-Assessment 2</li> <li>-Mocks</li> </ul>
<b>Organisation topic to complete</b>	<ul style="list-style-type: none"> <li>-Recap what an enzyme is and the uses of enzymes in digestion</li> <li>-Required practical looking into the effect of pH on an enzyme controlled reaction</li> <li>-Food tests required practical</li> <li>-Summary and revision of Paper 1 material</li> </ul>	<ul style="list-style-type: none"> <li>- Use models to demonstrate enzyme activity and specificity</li> <li>- Develop practical skills for enzymes required practical (Investigate the effect of pH on the rate of reaction of amylase)</li> <li>- Practice experimental skills with Required Practical 3 (Use qualitative reagents to test for a range of carbohydrates, lipids and proteins)</li> </ul>	<ul style="list-style-type: none"> <li>-Data collection for required practical 4 for pH effect on enzymes</li> <li>- Demonstration of collecting accurate results from food test required practical and ability to interpret these correctly</li> <li>-Required practical review and evaluation questions</li> <li>- PPQ for Paper 1</li> <li>-Assessment 2</li> <li>-Mocks</li> </ul>
<b>Homeostasis and Response</b>	<ul style="list-style-type: none"> <li>- Homeostasis</li> <li>- Structure, function and adaptations of the nervous system</li> <li>- Role of chemicals at the synapse</li> <li>- What is involved in a reflex action and its role</li> <li>- The role of the endocrine system and hormones</li> <li>- How blood glucose is controlled</li> <li>- Roles of insulin and glucagon</li> <li>- Causes, effects and treatments of type 1 and 2 diabetes</li> <li>- The role of hormones in human reproduction</li> <li>- Know a variety of contraception methods – hormonal and non-hormonal</li> <li>- Describe the use of hormones in treating infertility and the process of IVF (HT)</li> </ul>	<ul style="list-style-type: none"> <li>-Build on experimental skills with Required Practical 6 (the effect of a factor on human reaction time)</li> <li>-Extract and interpret data from graphs and tables.</li> <li>-Translate information on reaction times to numerical and graphical form</li> <li>-Continue to develop understanding of practical terminology</li> <li>-Interpret graphs and data on the effects of insulin on blood glucose levels</li> <li>Consider the social and ethical issues of living with diabetes and the link between type 2 and obesity</li> <li>-Build on skills of interpreting data from tables and graphs in relation to hormones and the menstrual cycle</li> </ul>	<ul style="list-style-type: none"> <li>-Homeworks</li> <li>-Starter tasks/tests covering prior knowledge</li> <li>- Practical questions around reflex actions and other areas</li> <li>-Gap fill for synapses applying the correct key terminology</li> <li>-Research and collaborative sharing activity to describe and evaluate types of contraceptives- link to Catholic teachings</li> <li>-Debate/discussion on fertility treatments</li> </ul>

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	<ul style="list-style-type: none"> <li>- Role of adrenaline and thyroxine - Describe the process of negative feedback</li> </ul>	<ul style="list-style-type: none"> <li>-Build on evaluation skills – pros and cons of contraception method</li> <li>-Evaluate fertility treatments and the ethical issues associated with these (HT)</li> <li>Improve understanding of how scientific technologies can be used to our advantage</li> <li>-Use of modelling to explain a process of negative feedback mechanisms</li> </ul>	<ul style="list-style-type: none"> <li>- Evaluate graphs on blood glucose control to illustrate negative feedback understanding</li> <li>-AfL throughout lessons</li> </ul>
<p><b>Inheritance and Variation</b></p>	<ul style="list-style-type: none"> <li>- Structure of chromosomes and identification of genes, and DNA</li> <li>- Describe the differences between sexual and asexual Reproduction</li> <li>- Be familiar with the process of meiosis and why it is necessary for producing gametes</li> <li>- Compare mitosis and meiosis.</li> <li>- Describe DNA structure and the human genome</li> <li>- Use genetic cross diagrams to determine genetic inheritance.</li> <li>- Be familiar with genetic disorders – causes, symptoms, treatments</li> <li>- How to make informed judgements about the economic, social and ethical issues concerning embryo screening</li> <li>- Know that variation can arise from mutation</li> <li>- Causes of variation and examples of environmental and genetic variation</li> <li>- Describe the process of selective breeding and know the advantages/disadvantages associated with it</li> <li>-Consolidation work</li> </ul>	<ul style="list-style-type: none"> <li>-Debate the advantages and disadvantages of studying the human genome</li> <li>- Recall key terminology</li> <li>- Apply knowledge of inheritance to contextualised examples</li> <li>-Construct and interpret genetic cross diagrams</li> <li>- Understand simple probability</li> <li>-Develop evaluation skills</li> <li>-Improve understanding of the need to consider ethical issues regarding selective breeding</li> </ul>	<ul style="list-style-type: none"> <li>-Homeworks</li> <li>-Past paper questions</li> <li>-Evaluation of meiosis models</li> <li>-Comparisons table and PPQ for mitosis and meiosis</li> <li>- Jelly baby models of DNA structure</li> <li>-PPQ on inherited disorders</li> <li>-Worksheets to practice Punnett square diagrams</li> <li>-Arguments for and against embryo screening</li> <li>-Worksheets with questions on different examples of selective breeding</li> <li>-AfL throughout lessons</li> </ul>