

KS4 and KS5 Biology Long term planning grid

	<b>Autumn 1</b>	<b>Autumn 2</b>	<b>Spring 1</b>	<b>Spring 2</b>	<b>Summer 1</b>	<b>Summer 2</b>
<b>Year 10</b>	<p><b>ORGANISATION</b>  <b>What will be learnt?</b>                      L1 Tissues and organs, L2 The Human Digestive System, L3 The Chemistry of food, L4 Catalysts and Enzymes, L5 Factors affecting enzyme action, L6 How the digestive system works, L7 Making digestion efficient, L8 Breathing and Gas Exchange, L9 The blood, L10 Blood vessels, L11 The Heart, L12 CHD</p> <p><b>Main outcome:</b>                      We will learn about the human digestive system which provides the body with nutrients and the respiratory system that provides it with oxygen and removes carbon dioxide. In each case they provide dissolved materials that need to be moved quickly around the body in the blood by the circulatory system. Damage to any of these systems can be</p>	<p><b>ORGANISATION</b>  <b>What will be learnt?</b>                      L13 Helping the heart, L14 Effect of lifestyle, L15 Cancer, L16 Tissues and organs in plants, L17 Plant transport, L18 Transpiration and factors affecting it</p> <p><b>Main outcome:</b>                      We will learn about the human digestive system which provides the body with nutrients and the respiratory system that provides it with oxygen and removes carbon dioxide. In each case they provide dissolved materials that need to be moved quickly around the body in the blood by the circulatory system. Damage to any of these systems can be debilitating if not fatal. Although there has been huge progress in surgical techniques, especially with regard to coronary heart disease, many</p>	<p><b>INFECTION AND RESPONSE</b>  <b>What will be learnt?</b>                      L5 Culturing microorganisms , L6 Monoclonal antibodies and L7 Plant diseases and responses</p> <p><b>Main outcome:</b>                      Pathogens are microorganisms such as viruses and bacteria that cause infectious diseases in animals and plants. They depend on their host to provide the conditions and nutrients that they need to grow and reproduce. They frequently produce toxins that damage tissues and make us feel ill. This section will explore how we can avoid diseases by reducing contact with them, as well as how the body uses barriers against pathogens. Once inside the body our</p>	<p><b>HOMEOSTASIS AND RESPONSE</b>  <b>What will be learnt?</b>                      L1 Introduction to homeostasis, L2 Structure and function of the nervous system, L3 Reflexes, L4 Measuring reaction times, L5 The Brain, L6 The Eye, L7 Control of body temperature. The rest of the module is to be completed next half term.</p> <p><b>Main outcome:</b>                      Explore the structure and function of the nervous system and how it can bring about fast responses. We will also explore the hormonal system which usually brings about much slower changes.</p> <p><b>Skills developed:</b>                      Practical skills:</p> <ul style="list-style-type: none"> <li>• Use of appropriate apparatus to make and</li> </ul>	<p><b>HOMEOSTASIS AND RESPONSE CONTINUED</b>  <b>What will be learnt?</b>                      L9 Human Endocrine System, L10 Control of blood glucose concentrations, L11 Diabetes, L12 Maintaining water and nitrogen levels, L13 Hormones involved in puberty, L14 The Menstrual cycle, L15 Hormones used in contraception, L16 Uses of hormones to treat infertility, L17 Negative Feedback (HT), L18 Plant hormones, L19 Investigating plant hormones.</p> <p><b>Main outcome:</b>                      Explore the structure and function of the nervous system and how it can bring about fast responses. We will also explore the hormonal system which usually brings about much slower changes.</p>	<p><b>REVISION/RETRIEVAL OF PREVIOUS MODULES, AND REQUIRED PRACTICAL PRACTICE</b></p>

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	<p>debilitating if not fatal. Although there has been huge progress in surgical techniques, especially with regard to coronary heart disease, many interventions would not be necessary if individuals reduced their risks through improved diet and lifestyle. We will also learn how the plant's transport system is dependent on environmental conditions to ensure that leaf cells are provided with the water and carbon dioxide that they need for photosynthesis.</p> <p><b><u>Skills developed:</u></b> Practical skills:</p> <ul style="list-style-type: none"> <li>• Use of appropriate apparatus to make and record a range of measurements accurately</li> <li>• Safe use of appropriate</li> </ul>	<p>interventions would not be necessary if individuals reduced their risks through improved diet and lifestyle. We will also learn how the plant's transport system is dependent on environmental conditions to ensure that leaf cells are provided with the water and carbon dioxide that they need for photosynthesis.</p> <p><b><u>Skills developed:</u></b> Practical skills:</p> <ul style="list-style-type: none"> <li>• Use of appropriate apparatus to make and record a range of measurements accurately</li> <li>• Safe use of appropriate heating devices and techniques</li> <li>• Use of appropriate apparatus and techniques for the observation</li> </ul>	<p>immune system is triggered which is usually strong enough to destroy the pathogen and prevent disease. When at risk from unusual or dangerous diseases our body's natural system can be enhanced by the use of vaccination. Since the 1940s a range of antibiotics have been developed which have proved successful against a number of lethal diseases caused by bacteria. Unfortunately many groups of bacteria have now become resistant to these antibiotics. The race is now on to develop a new set of antibiotics.</p> <p><b><u>Skills developed:</u></b> Practical skills:</p> <ul style="list-style-type: none"> <li>• Use of appropriate apparatus to make and record a range of measurements accurately</li> </ul>	<p>record a range of measurements accurately</p> <ul style="list-style-type: none"> <li>• Use of appropriate apparatus and techniques for the observation and measurement of biological changes and/or processes.</li> <li>• Safe and ethical use of living organisms (plants or animals) to measure physiological functions and responses to the environment</li> </ul> <p>Mathematical skills:</p> <ul style="list-style-type: none"> <li>• Construct and interpret frequency tables and diagrams, bar charts and histograms</li> </ul>	<p><b><u>Skills developed:</u></b> Practical skills:</p> <ul style="list-style-type: none"> <li>• Use of appropriate apparatus to make and record a range of measurements accurately</li> <li>• Use of appropriate apparatus and techniques for the observation and measurement of biological changes and/or processes.</li> <li>• Safe and ethical use of living organisms (plants or animals) to measure physiological functions and responses to the environment</li> </ul> <p>Mathematical skills:</p>	
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	<p>heating devices and techniques</p> <ul style="list-style-type: none"> <li>• Use of appropriate apparatus and techniques for the observation and measurement of biological changes and/or processes.</li> <li>• Safe and ethical use of living organisms (plants or animals) to measure physiological functions and responses to the environment</li> <li>• Measurement of rates of reaction by production of gas</li> <li>• Use of appropriate apparatus, techniques and magnification, including microscopes, to make observations of biological</li> </ul>	<p>and measurement of biological changes and/or processes.</p> <ul style="list-style-type: none"> <li>• Safe and ethical use of living organisms (plants or animals) to measure physiological functions and responses to the environment</li> <li>• Measurement of rates of reaction by production of gas</li> <li>• Use of appropriate apparatus, techniques and magnification, including microscopes, to make observations of biological specimens and produce labelled scientific drawings</li> </ul> <p>Mathematical skills:</p>	<ul style="list-style-type: none"> <li>• Safe use of appropriate heating devices and techniques</li> <li>• Use of appropriate apparatus and techniques for the observation and measurement of biological changes and/or processes.</li> <li>• Safe and ethical use of living organisms (plants or animals) to measure physiological functions and responses to the environment</li> <li>• Use of appropriate techniques and qualitative reagents to identify biological molecules and processes in</li> </ul>	<ul style="list-style-type: none"> <li>• Translate information between graphical and numeric form</li> </ul> <p><b><u>How will learning be assessed?</u></b></p> <ul style="list-style-type: none"> <li>• Half term assessment</li> <li>• Required practical assessment</li> <li>• Homework booklets of past exam questions</li> </ul>	<ul style="list-style-type: none"> <li>• Construct and interpret frequency tables and diagrams, bar charts and histograms</li> <li>• Translate information between graphical and numeric form</li> </ul> <p><b><u>How will learning be assessed?</u></b></p> <ul style="list-style-type: none"> <li>• Half term assessment</li> <li>• Required practical assessment</li> <li>• Homework booklets of past exam questions</li> </ul>	
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	<p>specimens and produce labelled scientific drawings</p> <p>Mathematical skills:</p> <ul style="list-style-type: none"> <li>• Recognise and use expressions in decimal form</li> <li>• Use an appropriate number of significant figures</li> <li>• Construct and interpret frequency tables and diagrams, bar charts and histograms</li> <li>• Use a scatter diagram to identify a correlation between two variables</li> <li>• Translate information between graphical and numeric form</li> <li>• Plot two variables from experimental or other data</li> <li>• Calculate areas of triangles and</li> </ul>	<ul style="list-style-type: none"> <li>• Recognise and use expressions in decimal form</li> <li>• Use an appropriate number of significant figures</li> <li>• Construct and interpret frequency tables and diagrams, bar charts and histograms</li> <li>• Use a scatter diagram to identify a correlation between two variables</li> <li>• Translate information between graphical and numeric form</li> <li>• Plot two variables from experimental or other data</li> <li>• Calculate areas of triangles and rectangles, surface areas and volumes of cubes</li> </ul>	<p>more complex and problem-solving contexts including continuous sampling in an investigation</p> <p>Mathematical skills:</p> <ul style="list-style-type: none"> <li>• Recognise and use expressions in decimal form</li> <li>• Recognise and use expressions in standard form</li> <li>• Make estimates of the results of simple calculations</li> <li>• Use an appropriate number of significant figures</li> <li>• Make order of magnitude calculations</li> <li>• Calculate areas of circles</li> </ul> <p><b><u>How will learning be assessed?</u></b></p>			
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	<p>rectangles, surface areas and volumes of cubes</p> <p><b><u>How will learning be assessed?</u></b></p> <ul style="list-style-type: none"> <li>• Half term assessment</li> <li>• Required practical assessment</li> <li>• Homework booklets of past exam questions</li> </ul>	<p><b><u>How will learning be assessed?</u></b></p> <ul style="list-style-type: none"> <li>• Half term assessment</li> <li>• Required practical assessment</li> <li>• Homework booklets of past exam questions</li> </ul> <p><b>INFECTION AND RESPONSE</b></p> <p><b>What will be learnt?</b></p> <p>L1 Communicable diseases review, L2 Human defecences, vaccinations review, L3 Antibiotics, painkillers and drug development, and L4 Culturing microorganisms</p> <p><b><u>Main outcome:</u></b> Pathogens are microorganisms such as viruses and bacteria that cause infectious diseases in animals and plants.</p>	<ul style="list-style-type: none"> <li>• Half term assessment</li> <li>• Required practical assessment</li> <li>• Homework booklets of past exam questions</li> </ul> <p><b>BIOENERGETICS</b></p> <p><b>What will be learnt?</b> L1 Photosynthesis, L2 Limiting factors affecting photosynthesis, L3 Plants uses of glucose, L4 Investigating photosynthesis, L5 Respiration, L6 Aerobic respiration, L7 Anaerobic respiration, L8 Metabolism</p> <p><b><u>Main outcome:</u></b> Explore how plants harness the Sun’s energy in photosynthesis in order to make food. This process liberates oxygen which has built up over millions of years in the Earth’s atmosphere. Both animals and plants use this oxygen to</p>			
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		<p>They depend on their host to provide the conditions and nutrients that they need to grow and reproduce. They frequently produce toxins that damage tissues and make us feel ill. This section will explore how we can avoid diseases by reducing contact with them, as well as how the body uses barriers against pathogens. Once inside the body our immune system is triggered which is usually strong enough to destroy the pathogen and prevent disease. When at risk from unusual or dangerous diseases our body's natural system can be enhanced by the use of vaccination. Since the 1940s a range of antibiotics have been developed which have proved successful against a number of lethal diseases caused by bacteria. Unfortunately many groups of bacteria</p>	<p>oxidise food in a process called aerobic respiration which transfers the energy that the organism needs to perform its functions. Conversely, anaerobic respiration does not require oxygen to transfer energy. During vigorous exercise the human body is unable to supply the cells with sufficient oxygen and it switches to anaerobic respiration. This process will supply energy but also causes the build-up of lactic acid in muscles which causes fatigue.</p> <p><b><u>Skills developed:</u></b></p> <p>Practical skills:</p> <ul style="list-style-type: none"> <li>• Use of appropriate apparatus to make and record a range of measurements accurately</li> <li>• Safe use of appropriate</li> </ul>			
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		<p>have now become resistant to these antibiotics. The race is now on to develop a new set of antibiotics.</p> <p><b><u>Skills developed:</u></b>          Practical skills:</p> <ul style="list-style-type: none"> <li>• Use of appropriate apparatus to make and record a range of measurements accurately</li> <li>• Safe use of appropriate heating devices and techniques</li> <li>• Use of appropriate apparatus and techniques for the observation and measurement of biological changes and/or processes.</li> <li>• Safe and ethical use of living organisms (plants or animals) to</li> </ul>	<p>heating devices and techniques</p> <ul style="list-style-type: none"> <li>• Use of appropriate apparatus and techniques for the observation and measurement of biological changes and/or processes.</li> <li>• Safe and ethical use of living organisms (plants or animals) to measure physiological functions and responses to the environment</li> <li>• Measurement of rates of reaction by production of gas</li> </ul> <p>Mathematical skills:</p> <ul style="list-style-type: none"> <li>• Recognise and use expressions in decimal form</li> <li>• Use ratios, fractions and percentages</li> </ul>			
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		<p>measure physiological functions and responses to the environment</p> <ul style="list-style-type: none"> <li>Use of appropriate techniques and qualitative reagents to identify biological molecules and processes in more complex and problem-solving contexts including continuous sampling in an investigation</li> </ul> <p>Mathematical skills:</p> <ul style="list-style-type: none"> <li>Recognise and use expressions in decimal form</li> <li>Recognise and use expressions in standard form</li> <li>Make estimates of the results of simple calculations</li> </ul>	<ul style="list-style-type: none"> <li>Find arithmetic means</li> <li>Use a scatter diagram to identify a correlation between two variables</li> <li>Understand and use the symbols: =, &lt;&gt;, &gt;, <math>\propto</math>, ~ d (HT)</li> <li>Solve simple algebraic equations</li> <li>Translate information between graphical and numeric form</li> <li>Plot two variables from experimental or other data</li> </ul> <p><b><u>How will learning be assessed?</u></b></p> <ul style="list-style-type: none"> <li>Half term assessment</li> </ul>			
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