		Curriculum Checkpoints: What do students know and what can they do?		
Unit	**Developing**	**Securing**	**Flourishing**	**Excelling**
1. Cell Biology	Identify the parts of eukaryotic plant and animal cells and give the adaptations of some specialised cells. Identify the parts of a microscope and be able to use a microscope to observe cells. Describe the process of diffusion and give some simple adaptations of cells to increase the rate of diffusion.	Describe the jobs of different parts of cells and describe differences between prokaryotic and eukaryotic cells. Describe what stem cells are and what they can become. Know and use the magnification equation to calculate magnifications. Give some simple precautions to undertake when culturing microorganisms. Describe what is found inside the nucleus of a cell and simply describe how cells divide. Describe, in basic terms, what happens in osmosis and active transport.	Compare the structures of eukaryotic and prokaryotic cells and explain adaptations of specialised cells to their function. Explain what differentiation is and when and where it occurs in plants and animals. Be able to take measurements using a microscope and use them to carry out calculations of the sizes of images and objects. Explain the precautions undertaken when culturing microorganisms and use observations to explain which antibiotic or antiseptic would be the most effective treatment. Explain what happens in the cell cycle and why mitosis is important. Explain the processes of osmosis and active transport.	Explain the potential uses of stem cells in medicine and evaluate the pros and cons of using them to treat medical conditions. Use the magnification equation to make complex calculations involving changing the measurents into differing prefixes. Collect data on the growth of bacteria and manipulate it to calculate both area and number of bacteria and give answers in standard form. Explain, using precise terminology, the stages of mitosis. Interpret data on osmosis experiments and use it to explain, in depth, what has happened in terms of concentration of water and to estimate the concentration of specific tissues.
2. Infection and Response	Recall the 4 different types of pathogens and know the names for common pathogens in plants and animals. Describe simply how the body protects itself from pathogens and understand the use of vaccines in stimulating the immune system. Know the differences between antibiotics and painkillers. State the stages of drug testing.	Describe the transmission, symptoms and control of different pathogens that cause infectious disease in plants and animals. Describe the role of white blood cells in immune response. Be able to distinguish between antigens and antibodies. Understand the use of vaccines in stimulating antibody production. Understand the differences between antibiotics and painkillers. Know what takes place at each stage of drug testing.	Compare and contrast how bacteria and viruses make us ill. Be able to explain the roles of the immune system in terms of phagocytosis, antibodies and antigens. Explain how vaccinations trigger an immune response and how herd immunity works. Explain how antibiotics and painkillers treat disease and symptoms . State the uses of monoclonal antibodies. Analyse data in relation to the phases of drug testing in terms of efficacy and safety.	Be able to link knowledge from other areas of the course (e.g. cell structure) to the implications of disease. Be able to recommend measures to limit spread of antibiotic resistance. Explain how monoclonal antibodies are developed and be able to apply this to diffent situations including locating and treating cancer, testing for pregnancy . Evaluate the use of monoclonal antibodies. Know the symptoms of a wide range of plant disease and ion deficiencies in plants. Know how plant disease is detected and be able to apply this information to unfamiliar plant diseases.
3. Organisation	Define tissue, organ and organ system. Identify the organs of the digestive system and give a simple account of their function. Give a basic account of the 'lock and key' hypothesis. Name some digestive enzymes and recall simple equations relating to substrates and products. Recall the basic structure of the circulatory system. Recognise the components of blood. Recall some risk factors for non-communicable diseases. Name some plant tissues and recall basic functions.	Describe levels of organisation within organisms and recall examples at each level. Identify the organs of the digestive system and explain their function. Describe the 'lock and key theory' of enzyme action. Recall that pH and temperature affect enzyme activity. Link knowledge of the circulatory system to cardiovascular disease and its treatments. Describe the role of blood components. Recall definitions of transpiration and translocation. Name factors that affect transpiration rate.	Explain how the effects of pH and temperature link to the 'lock and key' theory. Apply knowledge of digestive enzymes and bile to explain experimental results and graphs within familiar contexts. Evaluate treatments for cardiovascular disease. Explain the role of blood components. Recall how different diseases can interact. Link the structure of plant tissues with transpiration and translocation. Explain factors that affect transpiration rate.	Apply knowledge of digestive enzymes and bile to explain experimental results and graphs within unfamiliar contexts. Apply knowledge enzyme action to unfamiliar contexts. Apply knowledge of the circulatory system and cardiovascular disease to explain data or observations relating to unfamiliar contexts. Evaluate treatments relating to cardiovascular disease and use of blood products and demonstrate an in-depth knoweldge of risks. Interpret epidemiological data. Carry out multi-step calculations relating to organisation.
4. Bioenergetics	Be able to write word equations for photosynthesis, aerobic and anaerobic respiration. State the factors that affect the rate of photosynthesis. Describe the difference between aerobic and anaerobic respiration. State some of the effects of exercise on the body.	Define metabolism. Be able to write word and symbol equations for photosynthesis, aerobic and anaerobic respiration. Explain, in simple terms, the factors that effect the rate of photosynthesis. Describe and explain, in simple terms, how the body responses to exercise.	Write balanced symbol equations for photosynthesis and aerobic respiration. Be able to interpret data, and draw conclusions, relating to factors that effect the rate of photosynthesis. Be able to link photosynthesis and respiration rate with enzyme activity.	Evaluate the validity of practical methods. Process and explain data relating to contexts where there could be multiple limiting factors. Carry out multi-step calculations.
5. Ecology	Recall simple definitions of ecological terms. State how to conduct random sampling and transect sampling. Carry out simple calculations relating to sampling methods. Recognise that organisms are interdependent. State some effects of human activity on ecosystems.	Describe how adaptations relate to survival. Describe predator-prey interactions. Recall the stages of the ecology required practicals and perform simple data analysis relating to these. Describe some effects of human activity on biodiversity. Identify food production issues and link to human impacts on the environment. Construct pyramids of biomass.	Explain predator prey interactions. Analyse data and information relating to the impact on human activity on ecosystems. Link biomass transfer to farming practices. Calculate efficiency of transfer between trophic levels. Explain how sampling techniques can be improved to provide more valid outcomes. Explain the affects of human activity on biodiversity. Describe ways of preserving biodiversity. Explain how food security can be improved.	Carry out complex, multi-step calculations raleting to sampling techniques. Evaluate the validity of practical methods. Be able to make links across multiple parts of the specification (e.g. enzyme activity, respiration and the carbon cycle) to provide interpretation of complex data. Evaluate methods for preserving biodiversity. Evaluate ways of increasing food security.