



Biology Scheme of Learning

Year 10 – Term 6/Unit 12 (Triple only)

Intent – Rationale

.(TRIPLE ONLY) Students learn about homeostasis in action. This includes the control of body temperature, removing waste products, how the human kidney functions and the treatments that can be used when a kidney stops functioning: dialysis and transplantation.

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
GCSE Biology Topic B10 The human nervous system, B11 Hormonal co-ordination.	<ul style="list-style-type: none"> A Level Unit 3 Organisms exchange substances with their environment, Unit 5 Energy transfer in and between organisms and Unit 6 Organisms respond to changes.
What are the links with other subjects in the curriculum?	What are the links to SMSC, British Values and Careers?
<ul style="list-style-type: none"> Base the content here on what you already know but there will be time in future to liaise further as part of our collaborative work 	<ul style="list-style-type: none"> B12 L3 GB4deg SMSC M
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	What are the opportunities for developing mathematical skills?
FROM THE LIBRARY <i>Amazing Voyage Of The Cucumber Sandwich-612.3</i> <i>Digesting-612.3</i> <i>Dictionary Of Human Anatomy-612</i> <i>Eating-613.2</i> <i>Disgusting Digestion-612</i>	<ul style="list-style-type: none">



Biology Scheme of Learning

Year 10 – Term 6/Unit 12 (Triple only)

Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?		What opportunities are available for assessing the progress of students?																				
<p style="text-align: center;">Know</p> <ul style="list-style-type: none"> Describe how your body temperature is monitored and controlled. Describe how the body forms the waste products carbon dioxide and urea. Describe the processes of filtering and selective reabsorption in the kidneys. Explain how dialysis and transplants overcome kidney failure. <p style="text-align: center;">Apply</p> <ul style="list-style-type: none"> Explain why it is dangerous if our body temperature is too high or too low. Explain the link between high levels of protein in the diet and an increase in urea concentration in urine. Apply this knowledge to diagnose problems and suggest treatments for patients using urine test results. Analyse the similarities and differences between dialysis and usual kidney function. <p style="text-align: center;">Extend</p> <ul style="list-style-type: none"> Explain in detail how mechanisms lower or raise body temperature. Explain why the body needs to get rid of carbon dioxide, urea, excess ions and water. Describe the effect of ADH on the kidneys. Evaluate the advantages and disadvantages of each treatment. 																						
What subject specific language will be used and developed in this topic?	What opportunities are available for assessing the progress of students?																					
<table border="1"> <thead> <tr> <th>Word</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>Bladder</td> <td>A hollow organ in the lower abdomen that stores urine. The kidneys filter waste from the blood and produce urine, which enters the bladder through two tubes, called ureters. Urine leaves the bladder through another tube, the urethra.</td> </tr> <tr> <td>Capillaries</td> <td>The smallest blood vessels. They run between individual cells and have a wall that is only one cell thick.</td> </tr> <tr> <td>Core temperature</td> <td>Core body temperature refers to the temperature of the internal environment of the body. This includes organs such as the heart and liver, and the blood.</td> </tr> <tr> <td>Deamination</td> <td>The liver is involved in the process of deamination. This is the removal of the amino group from amino acids to form ammonia which is then converted to urea.</td> </tr> <tr> <td>Dialysis</td> <td>The process of cleaning the blood through a dialysis machine when the kidneys fail.</td> </tr> <tr> <td>Diffusion</td> <td>The spreading out of any particles in a solution, or particles in a gas, resulting in a net movement of particles from an area of higher concentration to an area of lower concentration down a concentration gradient.</td> </tr> <tr> <td>Embryonic stem cells</td> <td>Stem cells from an early embryo that differentiate to form the specialised cells of the body.</td> </tr> <tr> <td>Excretion</td> <td>Excretion is the removal of waste products from the body. It is different from egestion - which is the removal of undigested semi-solid waste (faeces) from your anus.</td> </tr> <tr> <td>Immunosuppressant drugs</td> <td>When an organ, such as a kidney, is transplanted the immune system of the recipient triggers the same response against the new organ it would have to any foreign material. Rejection can occur despite close matching of the donated</td> </tr> </tbody> </table>	Word	Definition	Bladder	A hollow organ in the lower abdomen that stores urine. The kidneys filter waste from the blood and produce urine, which enters the bladder through two tubes, called ureters. Urine leaves the bladder through another tube, the urethra.	Capillaries	The smallest blood vessels. They run between individual cells and have a wall that is only one cell thick.	Core temperature	Core body temperature refers to the temperature of the internal environment of the body. This includes organs such as the heart and liver, and the blood.	Deamination	The liver is involved in the process of deamination. This is the removal of the amino group from amino acids to form ammonia which is then converted to urea.	Dialysis	The process of cleaning the blood through a dialysis machine when the kidneys fail.	Diffusion	The spreading out of any particles in a solution, or particles in a gas, resulting in a net movement of particles from an area of higher concentration to an area of lower concentration down a concentration gradient.	Embryonic stem cells	Stem cells from an early embryo that differentiate to form the specialised cells of the body.	Excretion	Excretion is the removal of waste products from the body. It is different from egestion - which is the removal of undigested semi-solid waste (faeces) from your anus.	Immunosuppressant drugs	When an organ, such as a kidney, is transplanted the immune system of the recipient triggers the same response against the new organ it would have to any foreign material. Rejection can occur despite close matching of the donated	<ul style="list-style-type: none"> B12 L3 Long answer question – ADH Summative test B11 and B12 	
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	organ and the transplant patient. Immunosuppressant drugs greatly decrease the risks of rejection by blocking the immune system so that it is less likely to react against the transplanted organ.	
Kidney tubules	Each kidney contains around 1 million kidney tubules or nephrons. These nephrons are the structures that filter the blood and form urine, and they have the following main features: <ul style="list-style-type: none"> • a filtering unit called the glomerulus - which is inside a capsule • a region where selective reabsorption of useful substances happens • a region where the amount of water and salt is regulated 	
Selective reabsorption	The process in the kidney where the materials needed in the body such as glucose, some mineral ions, and water are reabsorbed back into the blood from the filtrate.	
Stem cells	Undifferentiated cells with the potential to form a wide variety of different cell types.	
Thermoregulatory centre	The area of the brain that is sensitive to the temperature of the blood.	
Tissue typing	Laboratory investigations that determine the type of antigens on a person's cells or tissues. This procedure is typically used prior to transplantation of tissues or organs.	
Urea	The waste product formed by the breakdown of excess amino acids in the liver.	
Vasoconstriction	The constriction or narrowing of the blood vessels.	
Vasodilation	The dilation or opening up of the blood vessels.	
Veins	Blood vessels that carry blood away from the heart. They usually carry deoxygenated blood and have valves to prevent backflow of the blood.	
Xenotransplantation	The transplantation of living cells , tissues or organs from one species to another.	



Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
L1 Controlling body temperature (TRIPLE ONLY)	Can I describe how your body temperature is monitored and controlled?	Can I explain in detail how mechanisms lower or raise body temperature?	
L2 Removing waste products (TRIPLE ONLY)	Can I describe how the body forms the waste products carbon dioxide and urea?	Can I explain why the body needs to get rid of carbon dioxide, urea, excess ions and water?	
L3 The human kidney (TRIPLE ONLY)	Can I describe the processes of filtering and selective reabsorption in the kidneys?	Can I describe the effect of ADH on the kidneys?	
L4 Dialysis vs Transplant (TRIPLE ONLY)	Can I explain how dialysis and transplants overcome kidney failure?	Can I evaluate the advantages and disadvantages of each treatment?	
B11 and B12 Test	A summative test on units B11 and B12		