



Biology Scheme of Learning

Year 9 – Term 4/Unit 4

Intent – Rationale

Building on students understanding of cells and their specialisation to look at organ systems in both plants and animals. The systems are linked to how they enable an organism to perform its life processes effectively. Treatments for life threatening conditions are considered for example a comparison of stents and statins and an evaluation of their positives and negatives considered. The role of water in a plant is explored as the transport of water in plants is covered alongside experiments to illustrate this and factors that affect water’s movement.

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
<p>Topic B7.1 Cells and Tissues Topic C7.2 Particles Topic B7.3 Photosynthesis Topic B8.1 Lungs and exchange Topic B8.2 Respiration GCSE B1 Cells and their specialisation, diffusion, osmosis and active transport.</p>	<ul style="list-style-type: none"> GCSE Units 5 Communicable Diseases, 6 Preventing and treating disease, 7 Non-communicable Disease, 8 Photosynthesis, 9 Respiration and 16 Adaptation, interdependence and competition. A Level 6 Exchange and Mass Transport
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"> Use the coded help guides to complete this section (discussion morals and ethics – heart transplant ADD code)
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	What are the opportunities for developing mathematical skills?
<p>FROM THE LIBRARY</p> <p><i>Cell Division and Genetics</i>; Robert Sneddon- 572 <i>Benefits of Bacteria</i>; Robert Sneddon-616 <i>Animals Multi Celled Life</i>; Robert Sneddon-571 <i>Cells and Systems</i>; Anita Ganeri-574.8 <i>Plants and Fungi-Multi-Celled Life</i>; Robert Sneddon-571.62 <i>Epidemic</i>; Brian ward-614 <i>Complete Wellbeing-A guide to Symptoms and Cures</i>; Dr.C Shreeve-613 <i>Heart-How the Blood Gets Around the Body</i>; Richard Walker 612</p>	<ul style="list-style-type: none"> Mean Area Magnification



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Biology Scheme of Learning

Year 9 – Term 4

Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?	
<p>Know</p> <ul style="list-style-type: none"> State the main components in blood. State the three main types of blood vessel and recognise them from diagrams. Describe the function of the main structures of the human heart. Describe why a person may need an artificial pacemaker or an artificial heart. List the main structures of the gas exchange system. Recognise examples of plant organs and tissues and state their functions. State that transpiration is the evaporation of water vapour from the leaves. Recognise the factors that affect transpiration. 	
<p>Apply</p> <ul style="list-style-type: none"> Describe the function of each component in blood. Explain how the structure relates to the functions of blood vessels. Describe the problems that can develop with blood vessels in the heart and their treatments. Summarise the advantages and disadvantages different treatments of heart problems. Describe the function of the main structures of the gas exchange system Describe how plant organs are involved in the transport system. Describe how the opening and closing of stomata is controlled by guard cells. Explain why temperature, humidity, light intensity and the amount of air flow affect the rate of transpiration. 	
<p>Extend</p> <ul style="list-style-type: none"> Explain how a blood cells structure relates to its function. Explain in detail the importance of a double circulatory system. Explain in detail how the structure of the different parts of the human heart is related to their function. Evaluate in detail the different methods used in the treatment of heart problems. Explain in detail how adaptations of alveoli result in efficient gas exchange. Explain how the structures of tissues in the leaf are related to their functions and identify them using a microscope. Suggest reasons for differences in the number and distribution of stomata, as well as their adaptations. Apply particle model to explain in detail why temperature, humidity, light intensity and the amount of air flow affect the rate of transpiration. 	
What subject specific language will be used and developed in this topic?	What opportunities are available for assessing the progress of students?
<ul style="list-style-type: none"> aorta - the artery that leaves the heart from the left ventricle and carries oxygenated blood to the body arteries - blood vessels that carry blood away from the heart. They usually carry oxygenated blood and have a pulse atria - the upper chambers of the heart capillaries - the smallest blood vessels. They run between individual cells and have a wall that is only one cell thick coronary arteries - the blood vessels that supply oxygenated blood to the heart muscle double circulatory system - the circulation of blood from the heart to the lungs is separate from the circulation of blood from the heart to the rest of the body epidermal - the name given to cells that make up the epidermis or outer layer of an organism guard cells - surround the stomata in the leaves of plants and control their opening and closing haemoglobin - the red pigment that carries oxygen around the body in the red blood cells 	<ul style="list-style-type: none"> B4 long answer question – recall components of the blood and evaluate different heart replacement valves. B4 summative test – overall understanding of content and the ability to apply to unfamiliar contexts.



- palisade mesophyll - the upper layer of the mesophyll tissue in plant leaves made up of closely packed cells that contain many chloroplasts for photosynthesis
- phloem - the living transport tissue in plants that carries dissolved food (sugars) around the plant
- plasma - the clear yellow-liquid part of the blood that carries dissolved substances and blood cells around the body
- platelets - fragments of cells in the blood that play a vital role in the clotting mechanism of the blood
- pulmonary artery - the large blood vessel that takes deoxygenated blood from the right ventricle of the heart to the lungs
- pulmonary vein - the large blood vessel that carries oxygenated blood from the lungs back to the left atrium of the heart
- red blood cells - biconcave cells that contain the red pigment haemoglobin and carry oxygen around the body in the blood
- spongy mesophyll - the lower layer of mesophyll tissue in plant leaves that contains some chloroplasts and many large air spaces to give a big surface area for the exchange of gases
- statins - drugs used to lower blood cholesterol levels and improve the balance of high- to low-density lipoproteins in the blood
- stent - a metal mesh placed in a blocked or partially blocked artery. They are used to open up the blood vessel by the inflation of a tiny balloon
- translocation - the movement of sugars from the leaves to the rest of the plant through the phloem
- transpiration - the loss of water vapour from the leaves of plants through the stomata when they are opened to allow gas exchange for photosynthesis. It involves evaporation from the surface of the cells and diffusion through the stomata
- urea - the waste product formed by the breakdown of excess amino acids in the liver
- veins - blood vessels that carry blood away from the heart. They usually carry deoxygenated blood and have valves to prevent the backflow of blood
- vena cava - the large vein that brings deoxygenated blood from the body into the heart
- ventricles - chambers of the heart that contract to force blood out of the heart
- white blood cells - blood cells involved in the immune system of the body. They engulf pathogens and make antibodies and antitoxins
- xylem - the non-living transport tissue in plants that transports water from the roots to the leaves and shoots



Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
The Blood	Can I state the main components of blood and their functions?	Can I explain how the structure links to function?	
The blood vessels	Can I state the 3 main blood vessels and their functions?	Can I explain in detail the importance of the double circulatory system?	
The heart	Can I describe the function of the main structures of the human heart?	Can I explain in detail how the structure of the different parts of the human heart is related to their function?	
Helping the heart	Can I describe why a person may need an artificial pacemaker or an artificial heart?	Can I evaluate in detail the different methods used in the treatment of heart problems?	
Breathing and gas exchange	Can I describe the function of the main structures	Can I explain in detail how adaptations of alveoli result in	



	of the gas exchange system?	efficient gas exchange?	
Tissues and organs in plants	Can I recognise examples of plant organs and tissues and state their functions?	Can I explain how the structures of tissues in the leaf are related to their functions and identify them using a microscope ?	
Transport systems in plants	Can I describe how plant organs are involved in the transport system?	Can I explain how the structure of root hair cells, xylem, phloem and stomata are adapted to their functions?	
Evaporation and Transpiration	Can I state that transpiration is the evaporation of water vapour from the leaves?	Can I suggest reasons for differences in the number and distribution of stomata, as well as their adaptations ?	
Factors affecting transpiration	Can I recognise the factors that affect transpiration?	Can I apply particle model to explain in detail why temperature	



		e, humidity, light intensity and the amount of air flow affect the rate of transpiration?	
Test	Summative assessment		