

UNIT 6 Movement and Homeostasis

	Learning Outcomes	Suggested Teaching Activities	Online Resources	Other resources
	<p>7(a) Distinguish between bone and cartilage</p> <p>7 (b) Describe bone as a living tissue with tough collagen fibres embedded in a matrix of hard, rigid calcium phosphate</p> <p>7 (c) Describe cartilage as a living tissue with cells secreting a tough, flexible, water-filled material forming a cushion-like, load-spreading covering to the bone surfaces at joints and a flexible support in the trachea</p> <p>7 (d) Describe the characteristics of fibrous tissue: connective tissue, white fibrous (collagen) in tendons (inelastic) and yellow elastin in ligaments (elastic)</p> <p>7 (f) Distinguish between tendons (attach muscles to bones, inelastic) and ligaments (join bone to bone, elastic)</p> <p>7 (h) Describe muscle as tissue that produces movement by contracting, using energy derived from respiration</p>	<p>Students should be given a sheet with Key terms and illustrative drawings on to fill in descriptions.</p> <p>They should be referred to various parts of the body e.g. feel the nose/external ears and see how flexible it is then look at a skull to see that there is no hard tissue there.</p> <p>Slides of bone and cartilage could be shown.</p> <p>A summary table can be copied or given out</p>	<p>http://www.bioschool.co.uk/bioschool.co.uk/images/pages/bone.JPG.htm</p> <p>http://www.bioschool.co.uk/bioschool.co.uk/images/pages/cartilage.JPG.htm</p> <p>http://www.medicalmultimedigroup.com/pated/images/foot/foot_achilles_tendon_anatomy01.jpg</p> <p>Tendons in situ (drawing)</p> <p>http://faculty.clintoncc.suny.edu/faculty/Michael.Gregory/files/Bio%20102/Bio%20102%20lectures/animal%20cells%20and%20tissues/Image8.jpg</p> <p>White fibrous tissue</p> <p>http://www.upei.ca/~morph/webct/Modules/Connective_Tissue/irregct.html</p> <p>Pic of yellow fibrous tissue on this page</p> <p>http://www.max3d.com/toby/workingprogress/characters/</p> <p>Animation of arm muscle contracting</p>	<p>P. Gadd pg 96-97 Fig 10.9 and 10.10</p> <p>D. Mackean pg 111-112 fig 16.3, 16.5 and 16.12</p> <p>P. Gadd pg 100 summary table</p>
	<p>7 (e) List the functions of the skeleton: to support and protect soft tissues, to increase effectiveness of movement by providing levers, as the site of bone marrow and production of red, and some white, blood cells</p>	<p>Students should be asked to imagine a body without a skeleton and then brainstorm the outcome. From this a list of functions can be made.</p>	<p>http://users.erols.com/jrule/dhtml/Skeleton/skeletonheadworksx.html</p> <p>Simple build a skeleton on screen</p> <p>http://www.bbc.co.uk/science</p>	<p>P. Gadd pg 95 summary table</p> <p>D. Mackean pg 111 fig 16.1</p>

	Examine a skeleton or model of a skeleton	Students should examine a human skeleton and fill in labels on a sheet showing a drawing of the skeleton	/humanbody/body/interactive/s/3djigsaw_02/index.shtml?skeleton Another more comprehensive one from BBC	P. Gadd pg 93 Fig 10.3 http://www.softline.co.uk/version_two/eprod_skeleton.html Ultimate skeleton software to buy
	7 (g) Identify from a drawing and describe the action of: a hinge joint (elbow) and a ball and socket joint (shoulder) Examine the structure of, and movement at, a joint from a limb of an animal.	Drawings should be made of the structure of the elbow/knee and shoulder/hip joints Students should look at a range of joint types and see how they move.	http://distance.stcc.edu/AandP/AP/AP1pages/joints/synovial.htm Simple animations of all joint types http://www.bbc.co.uk/science/humanbody/body/factfiles/arm_and_hand.shtml Joint animations and models from the BBC	P. Gadd pg 98 Fig 10.13 and 10.14 D. Mackean pg 116-117 fig 16.16 and fig 16.18 P. Gadd pg 97 practical
	7 (i) Identify the bones of the arm and shoulder and show the origins and insertions of the biceps and triceps muscles 7 (j) Explain antagonistic muscle action in the arm	Students should be given a sheet with drawing of the arm showing muscles, bones, tendons and ligaments to label. They should explore the raising and lowering of their own lower arm to see what the muscles do. They could make model arm using cardboard template for bones and rubber bands for the antagonistic muscles. Lowering and raising the lower arm will show what the muscles do.	http://www.explorit.org/science/bone_images.html Clickable bone identification page http://www.longleypublications.co.uk/biology/KS3Biology/antagonistic.htm Animation showing the movement of the arm and actions of the biceps and triceps muscle. http://resources.yesican.yorku.ca/red_rover/sa_arm.html	P. Gadd pg 101 Fig 10.20 a and b D. Mackean pg 119 fig 16.24
	8 (a) Define homeostasis 8 (b) Define excretion	Students should be given a sheet with Key terms defined plus illustrative examples.		P. Gadd pg 104 and 109

	<p>8 (e) Define excretion as the removal of waste products of metabolism from the blood (urea and carbon dioxide)</p> <p>8 (g) Distinguish between heat and temperature</p> <p>8 (h) Define regulation of body temperature as maintaining a steady internal temperature by balancing heat production and heat loss</p>	<p>These could have gaps in to be filled in from texts, OHT or internet.</p> <p>Students can explore the difference between heat and temperature by giving different volumes of water the same amount of heat and then measuring their temperature</p>		<p>D. Mackean pg 92</p> <p>P. Gadd pg 105 11.3 practical Fig 11.3</p>
	<p>8 (i) Identify from a drawing the main structures involved in heat loss by the skin: sweat glands and ducts, capillaries and associated arterioles</p> <p>8 (j) Relate the evaporation of sweat to the concept of specific latent heat</p> <p>8 (k) Describe the effect of vasodilation and vasoconstriction of arterioles in the skin</p> <p>8 (l) Explain the mechanism of heat gain and its conservation in the body</p>	<p>Students should be given a cross-section drawing of the skin to label from a model, text, OHT or inter-net</p> <p>Students should experience the cooling effect of alcohol on the skin as it evaporates and relate this to the cooling effect of sweat; this should be explained in term of latent heat of vaporisation. Notes on this should be made.</p> <p>Students should be directed into thinking what the changes are in the body when they get hot and cold. From this the teacher can describe effects to loose and to gain heat. Notes should be given on this maybe in table form comparing the two scenarios. Video of this could be shown</p>	<p>http://www.s-cool.co.uk/topic_quicklearn.asp?loc=ql&topic_id=8&quicklearn_id=1&subject_id=17&ebt=60&ebn=&ebs=&ebl=&elc=4</p> <p>Contains information on the role of the skin in temperature regulation and includes an animation showing changes in the skin when body temperature rises and falls.</p> <p>http://support.caed.asu.edu/radiant/01_thermalComfort/thermalC_physiology_02.htm</p> <p>Vasodilation and evaporation animated</p> <p>http://www.bbc.co.uk/schools/gcsebitesize/biology/humans/homeostasisrev3.shtml</p> <p>Bitesize animation showing thermoregulation.</p>	<p>P. Gadd pg 104 Fig 11.1 P. Gadd pg 106</p> <p>D. Mackean pg 96 fig 14.1</p> <p>P. Gadd pg 106-107 Fig 11.5</p> <p>D. Mackean pg 98-99 fig 14.4</p>
	<p>8 (c) Describe kidney function as a process of filtration followed by selective reabsorption of glucose, salt, urea and water, resulting in adjustment of the</p>	<p>Students should be given notes on the function of kidney followed by a chance to do or see a dissection of a kidney and draw the various regions.</p>	<p>http://faculty.washington.edu/kepeter/119/images/kidney_sections.htm</p> <p>Latex injected kidney</p>	<p>P. Gadd pg 110-111 Summary table pg 111</p> <p>D. Mackean pg 92-94 fig</p>

	concentration of the blood plasma 8 (b) Cut a longitudinal section through a mammalian kidney and identify the cortex, medulla, pyramids, pelvis and ureter.		sections http://www.sunyniagara.cc.ny.us/val/sheepkidney.jpg Clear sectioned kidney, labelled	13.2, 13.3, 13.4, 13.5 P. Gadd pg 110 Fig 12.3 and 12.4
	8 (d) Relate the process of filtration to blood pressure in the glomerulus, collection of filtrate in Bowman's capsule and reabsorption of materials at appropriate sections in the kidney tubule.	The students should be given a description of the various parts of the kidney and how they work. The areas of the kidney should be related to the parts of the renal tube and their functioning. An animation would be very useful here from a video or the internet plus microscope slide/photomicrographs.	http://www.mhhe.com/biosci/genbio/elearning/raven6/resources58.mhtml TWO kidney animations, A and B, v good	P. Gadd pg 110-111 Fig 12.6 and 12.5 D. Mackean pg 92-94 fig13.5
	8 (f) Describe the effects of heavy sweating and diarrhoea on urine production and water balance and the function of ADH (antidiuretic hormone) on water balance.	Students should refer back to the skin and the loss of water in sweat. They should then be encouraged to link this to the effect on urine production and similarly with diarrhoea. They should then draw a flow chart, from OHT/text/internet, showing how ADH affects water content of body.	http://www.bbc.co.uk/scotland/education/bitesize/standard/biology/animal_survival/water_and_waste_rev2.shtml Simple outline of water gain and loss in the body from BBC BiteSize	P. Gadd pg 112 Fig 12.7 D. Mackean pg 95
	8 (m) State that the pancreas acts as a detector of changes in the concentration of blood glucose, leading to the release of insulin. 8 (n) Describe the part played by the liver in the formation of insoluble glycogen in response to insulin release and its response to the release of adrenaline. 8 (o) Describe the effect of glucagon, released by the pancreas, on the liver and explain the part it plays in homeostatic control of the blood glucose concentration.	Students should discuss the need for glucose for respiration and the role of blood in transporting this glucose to cells where respiration happens. They should relate back to osmosis and then understand that glucose blood must be constant due to osmosis effects and the delicate nature of blood cells. They should be reminded that glucose comes from the intestines and is stored as glycogen in muscles and liver and excess over this is stored as fat. A flow chart of effects of glucose change can be built up through discussion	http://www.bbc.co.uk/schools/gcsebitesize/biology/humans/homeostasisrev5.shtml Diagram showing glucoregulation from BBC Bitesize http://www.mhhe.com/biosci/genbio/animation_quizzes/animation_58.htm Animation of basic pancreas function http://t2.technion.ac.il/~szivk	D. Mackean pg 157 P. Gadd pg 108

			ere/images/regulation.png Simple flow chart diagram	Fig 11.6
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