

3.1.2 Transport in animals

- (a) the need for transport systems in multicellular animals To include an appreciation of size, metabolic rate and surface area to volume ratio (SA:V). *M0.1, M0.3, M0.4, M1.1, M2.1, M4.1*
HSW1, HSW3, HSW5, HSW8
- (b) the different types of circulatory systems To include single, double, open and closed circulatory systems in insects, fish and mammals.
- (c) the structure and functions of arteries, arterioles, capillaries, venules and veins To include the distribution of different tissues within the vessel walls. **PAG2**
- (d) the formation of tissue fluid from plasma To include reference to hydrostatic pressure, oncotic pressure and an explanation of the differences in the composition of blood, tissue fluid and lymph.
HSW8
- (e) (i) the external and internal structure of the mammalian heart **PAG2** HSW4
(ii) the dissection, examination and drawing of the external and internal structure of the mammalian heart
- (f) the cardiac cycle To include the role of the valves and the pressure changes occurring in the heart and associated vessels.
HSW2, HSW5, HSW8
- (g) how heart action is initiated and coordinated To include the roles of the sino-atrial node (SAN), atrio-ventricular node (AVN), Purkyne tissue and the myogenic nature of cardiac muscle (no detail of hormonal and nervous control is required at AS Level).
HSW2, HSW5, HSW8
- (h) the use and interpretation of electrocardiogram (ECG) traces To include normal and abnormal heart activity e.g. tachycardia, bradycardia, fibrillation and ectopic heartbeat.
M0.1, M1.1, M1.3, M2.4 HSW2, HSW5
- (i) the role of haemoglobin in transporting oxygen and carbon dioxide To include the reversible binding of oxygen molecules, carbonic anhydrase, haemoglobin acid, HCO_3^- and the chloride shift.
HSW8
- (j) the oxygen dissociation curve for fetal and adult human haemoglobin To include the significance of the different affinities for oxygen **AND** the changes to the dissociation curve at different carbon dioxide concentrations (the Bohr effect).
M3.1 HSW2, HSW8