

5.1.5 Plant and animal responses

- (a) (i) the types of plant responses To include the response to abiotic stress and herbivory e.g. chemical defences (such as tannins, alkaloids and pheromones), folding in response to touch (*Mimosa pudica*)
(ii) practical investigations into phototropism and geotropism **AND** the range of tropisms in plants.
M1.3, M1.6 PAG11 HSW4
- (b) the roles of plant hormones To include the role of hormones in leaf loss in deciduous plants, seed germination and stomatal closure.
- (c) the experimental evidence for the role of auxins in the control of apical dominance HSW5
- (d) the experimental evidence for the role of gibberellin in the control of stem elongation and seed germination HSW5
- (e) practical investigations into the effect of plant hormones on growth An opportunity for serial dilution.
An opportunity to use standard deviation to measure the spread of a set of data.
M0.2, M1.1, M1.2, M1.3, M1.4, M1.6, M1.9, M1.10, M3.1, M3.2 PAG11 HSW4
- (f) the commercial use of plant hormones To include the use of hormones to control ripening, the use of rooting powders and hormonal weed killers.
HSW12
- (g) the organisation of the mammalian nervous system To include the structural organisation of the nervous system into the central and peripheral systems **AND** the functional organisation into the somatic and autonomic nervous systems.
- (h) the structure of the human brain and the functions of its parts To include the gross structure of the human brain **AND** the functions of the cerebrum, cerebellum, medulla oblongata, hypothalamus and pituitary gland.
- (i) reflex actions To include knee jerk reflex and blinking reflex, with reference to the survival value of reflex actions.
M0.1, M0.2, M1.1, M1.2, M1.3, M1.6 PAG11 HSW4
- (j) the coordination of responses by the nervous and endocrine systems To include the 'fight or flight' response to environmental stimuli in mammals **AND** the action of hormones in cell signalling (studied in outline only) with reference to adrenaline (first messenger), activation of adenylyl cyclase, and cyclic AMP (second messenger).
- (k) the effects of hormones and nervous An opportunity to monitor physiological functions, for example with pulse rate measurements before, during and

mechanisms on heart rate

after exercise or sensors to record electrical activity in the heart.

An opportunity to use standard deviation to measure the spread of a set of data and/or Student's t-test to compare means of data values of two sets of data.

M0.1, M0.2, M0.3, M1.1, M1.2, M1.3, M1.6, M1.10, M3.1
PAG10, PAG11

- (I)** (i) the structure of mammalian muscle and the mechanism of muscular contraction
- (ii) the examination of stained sections or photomicrographs of skeletal muscle.

To include the structural and functional differences between skeletal, involuntary and cardiac muscle AND the action of neuromuscular junctions AND the sliding filament model of muscular contraction and the role of ATP, and how the supply of ATP is maintained in muscles by creatine phosphate.

An opportunity to monitor muscle contraction and fatigue using sensors to record electrical activity.

PAG1, PAG10, PAG11 HSW4