

Homeostasis and response

Homeostasis

Regulates internal conditions

optimum for enzymes all cell functions

Conditions controlled

blood glucose body temperature water levels

Receptors

detect stimuli

Coordination centres

brain spinal cord pancreas

Effectors

muscles glands

Nervous system

CNS: brain and spinal cord

electrical impulses neurones

Reflex arc

sensory neurone relay neurone synapse motor neurone

Reflex actions

automatic rapid protect from harm

Reaction time practical

ruler drop repeat and mean

Brain **Triple only**

cerebral cortex cerebellum medulla

Studying the brain **Triple only** **Higher tier**

brain damage patients electrical stimulation MRI scanning complex and delicate

Eye **Triple only**

structures accommodation dim light myopia and hyperopia

Body temperature **Triple only**

thermoregulatory centre vasodilation, sweating vasoconstriction, shivering

Hormones

Endocrine system

glands blood target organ pituitary master gland

Blood glucose

pancreas insulin glycogen Type 1 and Type 2

Water and nitrogen balance **Triple only**

lungs, skin, kidneys filtration, reabsorption dialysis or transplant

ADH and urea **Triple only** **Higher tier**

ADH from pituitary tubules more permeable deamination in liver ammonia to urea

Reproductive hormones

oestrogen testosterone FSH and LH progesterone

Contraception

hormonal barrier IUD sterilisation

Infertility treatment **Higher tier**

FSH and LH IVF

Glucagon, adrenaline, thyroxine **Higher tier**

glucagon: glycogen to glucose adrenaline: flight or fight thyroxine: metabolic rate
negative feedback

Plant hormones **Triple only**

Auxin **Triple only**

unequal distribution unequal growth

Phototropism **Triple only**

shoot bends to light auxin on shaded side

Gravitropism **Triple only**

roots down shoots up

Required practical **Triple only**

seedlings lengths and drawings

Gibberellins and ethene **Triple only** **Higher tier**

germination ripening

Commercial uses **Triple only** **Higher tier**

weed killers rooting powder fruit size