SUBJECT: Biology YEAR: 13 MTP TITLE: Response to the environment HALF TERM: 1-2 NO. OF LESSONS (approx): 31

Deliberate retrieval of expected prior knowledge

- Basic Biology Concepts: Understanding of cells, tissues, and organs.
- Nervous System: Basic structure and function of the nervous system.
- Endocrine System: Introduction to hormones and their roles.
- Plant Responses: Basic knowledge of plant growth and responses to light and gravity.

Academic transformation

- Stimuli Detection: Organisms detect internal and external stimuli through receptors.
- Nervous Coordination: Nerve impulses transmit electrical signals via neurons, leading to rapid responses.
- Hormonal Coordination: Hormones are chemical messengers that regulate slower, longer-lasting responses.
- Plant Growth Responses: Plants use growth factors like IAA to respond to light and gravity (phototropism and gravitropism).
- Reflex Actions: Simple reflexes involve a three-neuron pathway for rapid, protective responses.
- Homeostasis: Maintenance of stable internal conditions (e.g., blood glucose, temperature) through feedback mechanisms.
- Muscle Contraction: Skeletal muscles contract via the sliding filament model involving actin and myosin.

Personal transformation

- Neuroplasticity: How the brain adapts to learning and experience.
- Endocrine Disruptors: Impact of environmental chemicals on hormone systems.
- Biofeedback Techniques: Methods for controlling physiological processes through feedback.
- Artificial Intelligence in Neurology: Use of AI in understanding and treating neurological disorders.

Can I Learning Questions

- Can I describe how organisms respond to their environment to increases their chances of survival?
- Can I describe the role of receptors in the establishment of a generator potential?
- Can I explain how heart rate is controlled?
- Can I describe nervous coordination?
- Can I explain how skeletal muscles are stimulated to contract by nerves?
- Can I explain how blood glucose concentration is controlled?
- Can I describe how blood water potential is controlled?

Literacy / <u>Oracy</u>

Key vocabulary

Indoleacetic acid, gravitropism, phototropism, taxes, kineses, generator potential, Pacinian corpuscle, optical pigments, myogenic stimulation, sinoatrial node, atrioventricular node, Purkyne tissue, Bundle of His, chemoreceptor, autonomic nervous system, electrochemical gradient, resting potential, depolarisation, action potential, refractory period, saltatory conduction, neuromuscular junction, antagonistic, myofibril, tropomyosin, actinomyosin bridge, phosphocreatine, channel proteins, adrenaline, adenylate cyclase, cyclic AMP, protein kinase, posterior pituitary, antidiuretic hormone, glomerular filtrate, proximal convoluted tubule, medulla, loop of Henle, distal convoluted tubule, collecting ducts

Disciplinary reading

- Biofact sheets
- https://studywise.co.uk/a-level-revision/biology/
- https://www.s-cool.co.uk/a-level/biology
- AQA A Level Biology Revision Notes 2017 | Save My Exams

Misconceptions

Stimulus Detection: Confusing receptors' roles in detecting stimuli.
Reflex Actions: Believing all reflexes involve the brain.
Hormonal Responses: Assuming all hormonal responses are rapid.
Homeostasis: Misunderstanding the concept of negative feedback.
Muscle Contraction: Confusing the roles of actin and myosin in contraction.
Plant Responses: Overlooking the complexity of plant response mechanisms