Curriculum Sequencing - Year 11

<table>
<tr><td colspan="4">Year 11 Homeostasis A</td></tr>
<tr><td>Topics covered:

● What is homeostasis
● How homeostasis is controlled in the body
● The human nervous system
● Reflex arcs</td><td></td><td>How it links to what has been studied before:

● Cells
● Specialized cells
● Organization of the human body
● Practical skills</td><td>How it links to what will be studied:

● Homeostasis B</td></tr>
<tr><td colspan="2">Key words:
Coordination centres
Effectors
Homeostasis
Receptors
Reflex action
Stimuli
The brain
The central nervous system (CNS)
Neron
Synaps</td><td colspan="2">Key skills:
● Students should be able to explain that homeostasis and be able to name the control systems in the body.
● Students should be able to explain how the structure of the nervous system is adapted to its functions.
● Students should be able to understand that the nervous system enables humans to react to their surroundings and to coordinate their behaviour.
● Students should be able to explain the various structures in a reflex arc.
● Students should be able to extract and interpret data from graphs, charts and tables, about the functioning of the nervous system.
● Students should be able to translate information about reaction times between numerical and graphical forms.
● plan and carry out an investigation into the effect of a factor on human reaction time (RP6)</td></tr>
<tr><td colspan="2">Assessment focus

● End of topic test
● Formative assessment half way through the topic
● RP - reaction time.</td><td colspan="2">Revision tips

● Senica
● Educake
● Flash cards/ mind maps
● RAG checklist
● Practice exam questions</td></tr>
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Why we study it:
It is part of the AQA GCSE A science exam.

Mastery in this subject

Students should be able to expand and understand that Cells in the body can only survive within narrow physical and chemical limits. They require a constant temperature and pH as well as a constant supply of dissolved food and water. In order to do this the body requires control systems that constantly monitor and adjust the composition of the blood and tissues. These control systems include receptors which sense changes and effectors that bring about changes.

Year 11. Motion

Topics covered:	**How it links to what you have studied before:**	**How it links to what you will study:**
Speed = Distance X Time Distance Time graphs. Velocity Time graphs Acceleration Newton's First law Newton's Second Law Newton's Third Law Stopping Distance Momentum - Intro (HT) Momentum - Conservation of Momentum (HT)	**KS2: Newton's Ideas are part of the National Curriculum.** **KS3: D-T nd V-T graphs are first taught in year 7. Also the idea of Speed and how it is calculated.**	**LInks back to Forces. Also, linking the idea of force creating motion in objects in motors.** **Links to graph skills and mathematical skills that are used throughout science: Plotting graphs, calculating gradients, using equations.**

Key words:	**Key skills:**
Speed, Distance, Time, Units, Acceleration, Mass, Force, Line Graph, Gradient, Resultant Force, Push, Pull, Energy	**Investigation: Use of ICT in Investigation skills e.g. data loggers as alternative ways to investigate speed. Focus on Variables, methodology and accuracy. KNowing how to write and discuss the ideas and how to use them in different scenarios.** **Numeracy: Calculator and use of key equations and how to rearrange them. Opportunities to convert and correctly label units.**
Assessment focus Required practical activity 19: investigate the effect of varying the force on the acceleration of an object of constant mass, and the effect of	**Revision tips.** • Educake - test yourself on areas that you have done revision on to see how well you understand the knowledge. • Flash cards/ mind maps. Remind yourself of the content and then test what you know.

varying the mass of an object on the acceleration produced by a constant force. End of Unit Test	• RAG checklist. What do you know and don't know. • Practice exam questions, then check the answers and then improve your answers.
Why we study it: Force and motion are important parts of everyday life. As students study this unit, they will learn how these physical factors impact their lives and work. The lessons and activities will help students become aware of how we measure it, discuss and show it in scientific text and link this to real life concepts like stopping distance.	
Mastery in this subject: **To master this subject you will need to be fluent when using equations (successfully use in unexpected situations and successfully rearrange them) on speed, acceleration, momentum and Newton's Law. You will be able to successfully use the science within science investigations and real life situations where motion is hard to explain and apply Numeracy to.**	

Year 11: Forces		
Topics covered: Contact and non-contact forces Weight, mass and gravity Resultant forces Work done Elasticity Springs and Hooke's Law *Moments and pressure*	**How it links to what you have studied before:** KS2: Newton's Ideas are part of the National Curriculum. KS3: Forces are first taught in year 7 and students should be able to describe balanced and unbalanced forces. They have also practiced using some of the equations.	**How it links to what you will study:** Foundations for motion, the topic that follows. Links to magnetism and the motor effect. Links to chemistry with electrostatic forces and collision theory.
Key words: Vector, scalar, weight, mass, resultant force, free-body diagram,directly proportional, equilibrium, work done, elastic, limit of proportionality, *moment, pressure, lever, gear, fluid, atmospheric pressure, upthrust.*	**Key skills:** <u>Maths skills</u> Calculating weight and mass. Determining resultant force. Drawing to scale. Calculating work done. Drawing Force/extension graphs. *Calculating moments and pressure.* <u>Science Skills</u> Collecting valid data. Removing errors. Analysing results.	

Assessment focus
Require Practical: Investigating springs.
	Revision tips
	• Learn the equations for:
	  ○ Work done
	  ○ Force and extension	

End of unit test.	○ Weight ○ *Moments* ○ *Pressure* ● What is the limit of proportionality for springs? ● Practice drawing scale diagrams and free-body diagrams ● Describe the difference between vectors and scalars.
Why we study it: Force and motion are important parts of everyday life. As students study this unit, they will learn how these physical factors impact their lives and work. The lessons and activities will help students become aware of how we measure it, discuss and show it in scientific text and link this to real life concepts like work done and diving.	
Mastery in this subject To master this subject you will need to be fluent when using equations; successfully use and rearrange them in unexpected situations. You will also be able to use two equations to solve one problem. You will be able to successfully use your understanding of investigations to apply to real life situations.	

Year 11: Rates of reaction		
Topics covered: Factors affecting rates of chemical reactions. Concentration, pressure, surface area, Temperature, and catalysts.	**How it links to what you have studied before:** In KS2 we learnt that materials exist in different states. We learnt that some changes are reversible changes, and some are irreversible changes. KS3 We learnt that chemical reactions and chemical energy can be observed.	**How it links to what you will study:** Understanding that states of matter can change in a material, and that energy in reactions can affect the rate are starting points for this topic.
Key words: Energy, Reactants, Products, Activation energy, Endothermic reaction, exothermic, Reversible reaction, Collision theory, Reactant particles, Collision, Activation energy, Mass, Relative formula mass, Volume, Burette, Gradient, Catalyst, Concentration, Enzyme, Frequency, Reaction pathway, Reaction profile, Solution, Surface area, Tangent, Temperature, Volume,	**Key skills:** <u>Maths skills</u> Measuring reactions, and time. Measuring different states of matter. Calculating rate of reaction. Determining end of reaction. Drawing rates of reaction graphs. <u>Science Skills</u> Collecting valid data. Removing errors.	

	Analysing results
Assessment focus Required practical- Investigate a change of concentration affects the rate of reaction involving measuring gas produced and a method involving a change in colour or turbidity. End of Topic test	**Revision tips** • **Educake - quiz based revision** • **Seneca - Exam style questions** • **Flash cards/mind maps** • **RAG Topic checklists** • **Practice Exam questions.** • **Study capture - 5 mins at the end of day recapping what you covered in the lesson.**
Why we study it: Chemical reactions can occur at vastly different rates. Whilst the reactivity of chemicals is a significant factor in how fast chemical reactions proceed, there are many variables that can be manipulated in order to speed them up or slow them down. Chemical reactions may also be reversible and therefore the effect of different variables needs to be established in order to identify how to maximise the yield of desired product. Understanding energy changes that accompany chemical reactions is important for this process. In industry, chemists and chemical engineers determine the effect of different variables on reaction rate and yield of product. Whilst there may be compromises to be made, they carry out optimisation processes to ensure that enough product is produced within a sufficient time, and in an energy-efficient way.	
Mastery in this subject Students will be able to interpret results from a reaction graph. They will be able to identify the units of rates of reaction. Students will also be able identify that rates of reaction indicate time and volume, or mass.	