KAA Curriculum Overview	Science	Year 8	EOY Exam	Sequencing and Progression	
Rationale *Give an overview of what students are studying this year and why. Link directly to your overall curriculum intent.* Students will be studying the fundamental concepts required for GCSE in all three specialisms across science. In physics, students will study electricity and waves. In biology, students will organ systems and respiration. In chemistry, students will study the elements and atoms and separating techniques, as well as chemical reactions. The curriculum will give the students both substantive and disciplinary knowledge that they need to understand and explain phenomena that they experience in their everyday lives. The students will know more and be able to explain more over time. They will also be encouraged to think for themselves and to be curious and analytical as they look at experimental data.			*What content and skills will be assessed in the EOY exam?* All content covered this year. Skills: - Graph drawing & analysis - Maths calculations including rearranging formula	*How does this year build on what they've learnt last year?* Building on basic fundamental concepts in biology, chemistry and physics taught last year, students will be linking different ideas together.	*How will it benefit them as they move forward next year?* Students are able to begin GCSE at more advanced starting point as they have a strong KS3 foundation (with particular emphasis on what students struggle to conceptualise later on).

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Sum 1	Sum 2
Link to MTP Overview	Aut1 MTP Y8					
Topic studied & FeLINKrtile Question	**Biology**: The digestive & health	**Physics**: Electromagnets (pt1): Voltage, Resistance, Current	**Chemistry**: Particle model & Separating Techniques	**Biology:** Organisms (pt1): Breathing, respiration, interdependence	**Chemistry:** Reactions (pt2): Chemical energy and types of reaction	Revision **Physics:** Waves: Sound, Light, Waves effects and properties
Adjustments following last assessments / evaluation.	-Move this topic from sum1 to aut1. -Re-inputted health and nutrition to increase data/graph questions (a lot of these in this topic)	-Moved this topic from spr1 to aut2. -Re-planned booklet and lessons to reflect on misconceptions: break down explanations and change wording -More modelling to be introduced -More hands on experience to be incorporated throughout the lessons(practicals/investigations)	-Removed chemical formulae, atomic mass number and proton number and the periodic table & electronic configuration since these were covered in Y7. -Introduction of graphs and a practical accompanied with a practical write up for heat curves has been added as more time needed on graph skills and application thinking. -Murder investigation lesson to tie all separation techniques together and aid application.	-Move this topic from aut1 to spr2. -Breathing introduced in the topic because it links well to respiration -Turns structure of leaf and plant cells into one lesson to avoid re-teaching -Introduced practical and calculation practice	-Moved this topic from SUM2 to SUM1. More time needed. -Two lessons to cover balancing number as poses a big challenge throughout KS4 – invest time to lay the foundations in KS3 -More practicals introduced: thermal decomposition one, with write up and very simple subtraction calculations to aid practical and investigative techniques. -Intro to junior version of ionic bonding for ion formation to make more sense -A new lesson on ionic formulae to understand ratios and charges	-Moved this topic from aut1 to sum2. -Two weeks of teaching (possibly) since EoY exams fall in this term. -Removed echolocation, the ear and building a speaker, ultrasound, colour – leaving only what is necessary for GCSE.
Key knowledge and skills students need to have gained by the end of the unit	**Knowledge** -Know the structure of the digestive system & function of each organ involved in the digestive system -Explain the adaptation of the small intestine -Know the biological food groups of carbohydrates, lipids and proteins -Understand the uses of these food groups.	**Knowledge** -Know how electric circuits are shown as diagrams -Difference between battery and cell -Size of electric current = rate of flow of charge -Wires made up of metals – electrons moving freely - Battery supplies electrons with energy - Voltage is the energy per unit charge	**Knowledge** -The definition of, and relationship between, elements, atoms, compounds and mixtures -Solutes can be dissolved in solvents to make solutions -Difference between soluble and insoluble substances -Methods of separating mixtures including filtration, evaporation, distillation and chromatography and understanding the science behind each. (ie filtration used to	**Knowledge** -To be able to identify the different tissues in a leaf -To be able to explain their functions and adaptations of different plant tissues. -Know the word and symbol equation for photosynthesis -Explain how the chloroplast gets the reactants and removes the products - To know the word and symbol equation for respiration	**Knowledge** -Must know the law of conservation of mass – atoms cannot be created nor destroyed, mass of reactants is equal to mass of products - Atoms gaining electrons become negative ions and atoms losing electrons become positive ions. -The electron transfer from one atom to the other represents ionic bonding	**Knowledge** -Must know the properties of waves -Identify and label amplitude (max displacement of a point on the wave- height of crest- from position at rest & wavelength (distance from a point of the wave to the equivalent point on the next wave – trough to trough or peak to peak) -Frequency is the number of waves passing a point per second

	-Use qualitative reagents to test for a range of carbohydrates, lipids and proteins & understand positive and negative results - Know the functions of enzymes. Use the 'lock and key theory' as a model to explain enzyme action. -Explain how temperature affects enzyme activity -Know that a risk factor increases the rate of a disease. -Know the effects of smoking and alcohol on disease **Skills** -Be able to translate information between graphical and numerical forms -Extract data from charts, graphs and tables to support their answers/explanations -Interpret data about risk factors for specified diseases	-Potential difference is the energy difference between two points in the circuit -What is a resistor -Know symbols for: ammeter, voltmeter, lamp, switch, resistor -Know difference of parallel and series circuits. -Current same in each component in series -Pd shared between components in series -Current shared in parallel -Pd same in parallel **Skill** -Use the equation of current, charge, time and rearrange when needed. -Use the potential difference, energy ,charge equation -Set up circuits in series -Set up circuits in parallel	separate an insoluble substance from a mixture) -Know how to label all apparatus used -Be able to assign the appropriate separation method for each scenario posed **Skills** -Predicting the state of a substance at a given temperature based on its bp and mp -Identify and use of practical equipment to undertake filtration, evaporation and chromatography -Drawing graphs -Reading graphs and understanding where melting and boiling take place -Following a practical method -Writing up a lab-report/practical write-up	- Aerobic respiration takes place in the mitochondria to release energy. - Aerobic respiration releases more energy than anaerobic respiration due to the complete breakdown of glucose - Compare anaerobic respiration in a yeast cell with anaerobic respiration in a muscle cell. -To know the changes in the body that take place in response to exercise -To understand the changes in heart rate and breathing rate. -Organisms link together in food chains and food webs -Interaction of living organisms with their non-living environment -Disruption of food chains and food webs **Skills** -Use of flow charts to present sequences - Know how to construct the word equations for photosynthesis, aerobic respiration, anaerobic respiration in yeast (ethanol & carbon dioxide) and in muscles (lactic acid) -Perform the heart rate and breathing rate practical and complete all associated calculations	**Skills** -Use of practical equipment and following a method to carry out thermal decomposition - Must be able to balance symbol equations by adding big numbers in front of species to make the number of each species the same on both sides of an equation -Calculating Relative Formula Masses of compounds using the atomic mass numbers from the periodic table (big number)- must know that the subscript is the little number next to a species and represents how many numbers of that species are present in a compound. -Must be able to calculate the enthalpy change (energy change) of a reaction when given the enthalpies (energies) of each individual bond. -For exo, endo rxns (seen in Y7), students must be able to recognise/draw energy level diagrams showing the difference in energy of reactants and products.	-Must be able to compare transverse longitudinal waves -Describe how sound transfers energy – waves are vibration that travel through a medium (substance). -Refraction occurs at a boundary between different materials because the speed and wavelength of waves change (density of materials changes) -Know the electromagnetic spectrum in order of decreasing wavelength and increasing frequency and energy. **Skills** -Calculate speed of wave using frequency and wavelength and rearrange -Calculate the period of the wave using frequency and rearrange -Using a pencil and a protractor draw reflection or refraction

How is understanding assessed at the end of the unit?	End of topic test	End of topic test	End of topic test	End of topic test	End of topic test	Mini test (six lessons worth)