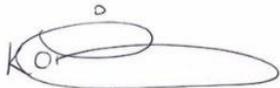


GENERAL SCIENCE- CURRICULUM – KS4 SCHEME OF WORK

<h3>General Science KS4 Scheme of Work</h3>	
Created By K O'Brien 30/07/21	Verified By V McHolland-Pilcher 16/10/21
	

<p>Please note that the points listed within this box are covered off within 'Point Five of our Curriculum Policy Part 2' – 'How We Do It'. We originally had all of this information listed on each individual Scheme of Work however this became less effective for ADO staff, making the documents more clunky and worse for the environment when we were required to print!</p>	<ul style="list-style-type: none">• Teaching, Learning and Assessment Methods• Equality Diversity and Inclusivity• Identifying Gaps in Learning and how we Close Those Gaps/ How we Support Students Exceeding Expectation• Personal, Social and Employability Skills• Declared Disability/ Support Needs
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YEAR 10 SCHEME OF WORK				
	Topic Overview	Learning Outcomes	Minimum Core Skills	Assessment & Tracking
Y10 Term CP1 Sept-Oct (6 weeks)	Biology- Cells	<ul style="list-style-type: none"> ▪ Cells Tissues and Organs: The Cell: What is it? What it is made up from? Use the acronym Proof of life MRS GREN as a building block. (Mrs Gren is a way to remember the features of living organisms- movement, respiration, sensitivity, growth, reproduction, excretion and nutrition ▪ Cells- are the unit of a living organism, contains parts to carry out life processes. ▪ Parts of a cell: ▪ Cell membrane: Surrounds the cell and controls movement of substances in and out. ▪ Nucleus: Contains genetic material (DNA) which controls the cell's activities. ▪ Vacuole: Area in a cell that contains liquid, and can be used by plants to keep the cell rigid and store substances. ▪ Mitochondria: Part of the cell where energy is released from food molecules. ▪ Cell wall: Strengthens the cell. In plant cells it is made of cellulose. ▪ Chloroplast: Absorbs light energy so the plant can make food. ▪ Cytoplasm: Jelly-like substance where most chemical processes happen. ▪ Know the adaptations for certain Cells that enable them to perform their role: ▪ There are many types of cell. Each has a different structure or feature so it can do a specific job. ▪ Structural adaptations: Special features to help a cell carry out its functions. ▪ Organisation of complex organisations: ▪ Tissue: Group of cells of one type. 	<ul style="list-style-type: none"> ▪ Technology- use of microscope ▪ Art and Design- drawing cells or making large structures on the ground made from nature with peers ▪ Comprehension- reading, writing, communicating ▪ English- students can make up their own acronyms to remember the features of living organisms or parts of a cell. Be mindful that students may struggle with processing the scientific words, ensure work is delivered at their appropriate levels with basic terminology ▪ Anatomy and Physiology – different parts of the body that support the skeleton ▪ ICT- further learning online for individual students ▪ PSHE/Life skills- understanding the body in order to take care of it and recognise any issues 	<ul style="list-style-type: none"> ▪ Baseline activity at the start of the term, an open and collaborative discussion with students to determine if they know anything about the topic before it is taught. This will enable the educator to see who has the confidence to speak out and give ideas and who will remain quiet ▪ Formative – fill in the gaps quizzes to be run throughout the half term. Description of term to be listed, and students to link what they think the correct term is. E.g. 'surrounds the cell and controls movement of substances in and out'= cell membrane. This will help to identify if learning is taking place ▪ Holistic Assessment- throughout full half term

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		<ul style="list-style-type: none"> ▪ Organ: Group of different tissues working together to carry out a job. ▪ Organ System: a group of organs working together to complete a more complex task e.g. Supply Oxygen to the living tissues, Absorb the nutrients from food, Procreate, Move or heal injuries. ▪ Multicellular organisms are composed of cells which are organised into tissues, organs and systems to carry out life processes. ▪ Uni-cellular: Living things made up of one cell. ▪ Microscopy: Use a light microscope to observe and draw cells. Both plant and animal cells have a cell membrane, nucleus, cytoplasm and mitochondria. Plant cells also have a cell wall, chloroplasts and usually a permanent vacuole. ▪ Body Systems Immune system: Protects the body against infections. ▪ Circulatory system: Transports substances around the body. ▪ Respiratory system: Replaces oxygen and removes carbon dioxide from blood. ▪ Muscular skeletal system: Muscles and bones working together to cause movement and support the body. ▪ Reproductive system: Produces sperm and eggs, and is where the foetus develops. 		
<p>Y10 Term CP2 Nov-Dec (6 weeks)</p>	<p align="center">Biology- Variation and Adaptation</p>	<ul style="list-style-type: none"> ▪ There is variation between individuals of the same species. Some variations are inherited, some are caused by the environment and some are a combination of both. ▪ Variation between individuals is important for the survival of a species, helping it to avoid extinction in an always changing environment. ▪ Types of Variation ▪ Representation of Variation data: Plant and animal adaptations in our local environment: 	<ul style="list-style-type: none"> ▪ ICT researching and getting information on what 'variation and adaptation mean' ▪ Mathematics- students to learn more about evolution and understand how many years this process has been 	<ul style="list-style-type: none"> ▪ ICT Baseline- students can be assessed on their understanding of using technology to find information out about the topic, and the ability of which they can extract ▪ Holistic assessments- educator to silently observe students

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		<p>Nettles, Beech tree, Himalayan Balsam, Bramble Dragonfly Nymphs, Amphibians, individual animal adaptations from within our area</p> <ul style="list-style-type: none"> ▪ Review the evidence for theories about how a particular species went extinct: Natural selection is a theory that explains how species evolve and why extinction occurs. Biodiversity is vital to maintaining populations. Within a species variation helps against environment changes, avoiding extinction. Within an ecosystem, having many different species ensures resources are available for other populations, like humans. 	<p>happening. Cross curricular with science</p> <ul style="list-style-type: none"> ▪ English reading, writing and processing information ▪ ICT watching a video (that is age appropriate- e.g. bitesize) that explains 'biodiversity' ▪ Art and Design- students to draw a picture of something within this half term- i.e. a comparison of a specie before and after it has evolved 	<p>and how much they are engaging/ behaving/ trying/ managing impulse control.</p> <ul style="list-style-type: none"> ▪ Peer assessment- students to work together to verbally discuss ways that the human race can improve factors within this half terms topic (e.g. to avoid extinction)
<p>Y10 Term CP3 Jan-Feb (6 weeks)</p>	<p>Biology – Genetics and DNA</p>	<ul style="list-style-type: none"> ▪ Model the inheritance of a specific trait and explore the variation in the offspring produced ▪ Inherited characteristics are the result of genetic information, in the form of sections of DNA called genes, being transferred from parents to offspring during reproduction. ▪ Chromosomes are long pieces of DNA which contain many genes. Gametes, carrying half the total number of chromosomes of each parent, combine during fertilisation. ▪ The DNA of every individual is different, except for identical twins. ▪ Find out why scientists Watson, Crick and Franklin were so important: Investigate the people behind significant advancements in our understanding ▪ The role of Genes in Inheritance: There is more than one version of each gene e.g. different blood groups. 	<ul style="list-style-type: none"> ▪ Mathematics- the amount of chromosomes humans have (46) with 22 pairs etc ▪ English- reading writing and communicating ▪ ICT- research/ reading. How is DNA different with identical twins? ▪ ICT- market research on DNA kits and what they do ▪ PSHE- Life skills ▪ Team work- students to be in pairs and be given one scientist each to look up and learn why they were so important within this topic. Present the findings either verbally, or written to the group 	<ul style="list-style-type: none"> ▪ Baseline activity at the start of the term, an open and collaborative discussion with students to determine if they know anything about the topic before it is taught. This will enable educator to see who has the confidence to speak out and give ideas and who will remain quiet ▪ Formative assessment on students abilities to work as a team/ leadership skills/ confidence and also their delivery of information they have learned ▪ Holistic Assessment- throughout full half term

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YEAR 10 SCHEME OF WORK				
	Topic Overview	Learning Outcomes	Minimum Core Skills	Assessment & Tracking
Y10 Term CP4 Mar-Apr (6 weeks)	Chemistry- Photosynthesis	<ul style="list-style-type: none"> ▪ The role of plants within food chains ▪ Parts of the Flower ▪ Flowers contain the plant’s reproductive organs ▪ Plants reproduce sexually to produce seeds, which are formed following fertilisation in the ovary ▪ Plants and algae do not eat, but use energy from light, together with carbon dioxide and water to make glucose (food) through photosynthesis. They either use the glucose as an energy source, to build new tissue, or store it for later use. ▪ Plants have specially-adapted organs that allow them to obtain resources needed for photosynthesis ▪ Iodine is used to test for the presence of starch. ▪ Use of pondweed to examine changes of light, CO₂, Count, plot graph ▪ Transpiration, stomata and water stress 	<ul style="list-style-type: none"> ▪ Horticulture studies- sow seeds ▪ Life skills- learning the importance of growth ▪ PSHE- health and wellbeing ▪ Mindfulness – focusing on the present moment ▪ Mathematics- graph plotting ▪ Geography- verbally discussing information about water stress etc ▪ English- reading writing and communicating 	<ul style="list-style-type: none"> ▪ Formative assessment- observing the commitment of the students to sow seeds and tend to them throughout this term and future terms (i.e. concentration levels are they able to see things through to the end etc) ▪ Matching activity- formative- fill in the gaps quiz (to get used to the terminology) ▪ Holistic Assessment- throughout full half term
Y10 Term CP5 May-Jun (6 weeks)	Physics- Gravity	<ul style="list-style-type: none"> ▪ Investigate factors that affect the size of frictional or drag forces: When the resultant force on an object is zero, it is in equilibrium and does not move, or remains at constant speed in a straight line. One effect of a force is to change an object’s form, causing it to be stretched or compressed. In some materials, the change is proportional to the force applied. ▪ Investigate variables that affect the speed of a toy car rolling down a slope: If the overall, resultant force on an object is non-zero, its motion changes and it slows down, speeds up or changes direction. ▪ Skill -Use the formula: speed = distance (m)/time (s) or distance-time graphs, to calculate speed. ▪ Facts -A straight line on a distance-time graph shows constant speed, a curving line shows acceleration. ▪ The higher the speed of an object, the shorter the time taken for a journey. 	<ul style="list-style-type: none"> ▪ Mathematics- mass and weight- how do they differ? Weigh some objects in different ways e.g. scales, and weigh tapes/ travel scales. Students to record down the weights ▪ Mathematics- with support do the calculations of the toy car rolling down slope etc ▪ English- reading writing and communicating ▪ Art and design- draw a diagram ▪ Eco Activities – collecting nature to then do mini experiments (i.e. stones/ pine cones/ conkers etc) 	<ul style="list-style-type: none"> ▪ Fun fact sheet- students to complete the calculations with support and then create a ‘fun fact’ sheet which can then be marked. (e.g.. “did you know that a toy car can roll down a slope..... this fast”)!) ▪ Collaborative- share fun facts with a peer and peers conduct feedback (important development detail) ▪ Holistic Assessment- throughout full half term

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		<ul style="list-style-type: none"> ▪ Explain the way in which an astronaut’s weight varies on a journey to the moon: Mass and weight are different but related. Mass Explain unfamiliar observations where weight is a property of the object; weight depends upon changes. ▪ Draw a force diagram for a problem involving Every object exerts a gravitational force on every gravity. ▪ Mass but also on gravitational field strength. ▪ Other object. The force increases with mass and decreases with distance. Gravity holds planets and moons in orbit around larger bodies. ▪ Skill Use the formula: weight (N) = mass (kg) x gravitational field strength (N/kg). ▪ Fact g on Earth = 10 N/kg. On the moon it is 1.6 N/kg. ▪ Investigate how pressure from your foot onto the ground varies with different footwear: Pressure acts in a fluid in all directions. It increases with depth due to the increased weight of fluid, and results in an upthrust. Objects sink or float depending on whether the weight of the object is bigger or smaller than the upthrust. Different stresses on a solid object can be used to explain observations where objects scratch, sink into or break surfaces. 		
<p>Y10 Term CP6 Jun-July (6 weeks)</p>	<p>Physics: Rock Formations and Climate</p>	<ul style="list-style-type: none"> ▪ Model the processes that are responsible for rock formation and link these to the rock features: Sedimentary, igneous and metamorphic rocks can be inter converted over millions of years through weathering and erosion, heat and pressure, and melting and cooling. ▪ Fact :The three rock layers inside Earth are the crust, the mantle and the core. ▪ Predict the method used for extracting metal based on its position in the reactivity series: There is only a certain quantity of any resource on Earth, so the faster it is extracted, the sooner it will run out. Recycling reduces the need to extract resources. 	<ul style="list-style-type: none"> ▪ Geography- rock formations ▪ Geography- climate, how it differs in different parts of the world and how climate change has dramatically changed/ what can we do more of? ▪ Art and design- add to our recycling wall display “save our river” trying to raise awareness of single use plastic 	<ul style="list-style-type: none"> ▪ Questions and answers as a group ▪ Holistic assessment ▪ Quality of concentration and organisational features ▪ Observation of students punctuation, grammar and spelling ▪ Motor skills observation when students are partaking in the art activity, see if they are struggling with things like cutting out. Speak with

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		<p>Most metals are found combined with other elements, as a compound, in ores. The more reactive a metal, the more difficult it is to separate it from its compound. Carbon displaces less reactive metals, while electrolysis is needed for more reactive metals.</p> <ul style="list-style-type: none"> ▪ Investigate the contribution that natural and human chemical processes make to our carbon dioxide emissions: Carbon is recycled through natural processes in the atmosphere, ecosystems, oceans and the Earth’s crust (such as photosynthesis and respiration) as well as human activities (burning fuels). Greenhouse gases reduce the amount of energy lost from the Earth through radiation and therefore the temperature has been rising as the concentration of those gases has risen. Scientists have evidence that global warming caused by human activity is causing changes in climate. 	<ul style="list-style-type: none"> ▪ English- reading writing and communicating ▪ ICT- Students to find one fact on sedimentary, igneous and metamorphic rock- could be done in pairs to promote working together ▪ Biology- the process of carbon dioxide and how it benefits living beings ▪ Animal science- which animal produces the most greenhouse gas? 	<p>occupational therapist to get help for any who may struggle with this</p>
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YEAR 11 SCHEME OF WORK				
	Topic Overview	Learning Outcomes	Minimum Core Skills	Assessment & Tracking
<p>Y11 Term CP1 Sept-Oct (6 weeks)</p>	<p>Biology- The Respiratory System</p>	<ul style="list-style-type: none"> ▪ Gas exchange mechanism: In gas exchange, oxygen and carbon dioxide move between alveoli and the blood. Oxygen is transported to cells for aerobic respiration and carbon dioxide, a waste product of respiration, is removed from the body. ▪ Investigate a claim linking height to lung volume: Performance of the Respiratory System 	<ul style="list-style-type: none"> ▪ English- reading writing and communication ▪ ICT- Facts about smoking ▪ Art and design/PSHE - create a quote to raise awareness about the dangers of smoking, and draw a 	<ul style="list-style-type: none"> ▪ Group observations- students to work in pairs to rotate doing the activities, and the other one timing them. ▪ Observation and marking on the smoking project to

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		<ul style="list-style-type: none"> ▪ Perform an experiment to gather data on working lung volume and compare with height ▪ Perform an experiment to show changes in breathing rate with levels of exercise. ▪ Smoking: Consequences and dangers: Research into effects of Smoking on the individual 	<p>cigarette box, listing the quote on there</p> <ul style="list-style-type: none"> ▪ Experiments perform a series of fitness movements and monitor the respiratory systems and increase in breathing ▪ Mathematics- monitor the changes in data when exercising ▪ Mathematics- comparing lung volume and compare with height 	<p>determine if students have taken the topic seriously.</p>
<p>Y11 Term CP2 Nov-Dec (6 weeks)</p>	<p>Chemistry- Metals</p>	<ul style="list-style-type: none"> ▪ Use experimental results to suggest an order of reactivity of various metals: Metals and non-metals react with oxygen to form oxides which are either bases or acids. ▪ Metals can be arranged as a reactivity series in order of how readily they react with other substances. ▪ Some metals react with acids to produce salts and hydrogen. ▪ Investigate a phenomenon that relies on an exothermic or endothermic reaction: During a chemical reaction bonds are broken (requiring energy) and new bonds formed (releasing energy). If the energy released is greater than the energy required, the reaction is exothermic. If the reverse, it is endothermic. ▪ Investigate changes in mass for chemical and physical processes: Combustion is a reaction with oxygen in which energy is transferred to the surroundings as heat and light. ▪ Thermal decomposition is a reaction where a single reactant is broken down into simpler products by heating. ▪ Chemical changes can be described by a model where atoms and molecules in reactants rearrange to make the products and the total number of atoms is conserved. 	<ul style="list-style-type: none"> ▪ Health and Safety- learning the importance of keeping safe when conducting experiments ▪ Mathematics- mass ▪ Peer work/team work ▪ Explorative skills ▪ Organisational features 	<ul style="list-style-type: none"> ▪ Health and safety observations when working on experiments ▪ Formative true and false quiz delivered by educator. Students to run to either a true tree or a false tree. Educator to work out percentage progress from the scores of each individual ▪ Holistic observation throughout the full half term ▪ Collaborative/peer learning and observations

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<p>Y11 Term CP3 Jan-Feb (6 weeks)</p>	<p>Biology- The Digestive System</p>	<ul style="list-style-type: none"> ▪ Food Groups ▪ Diet and Digestion: The body needs a balanced diet with carbohydrates, lipids, proteins, vitamins, minerals, dietary fibre and water, for its cells' energy, growth and maintenance. ▪ Organs of the digestive system are adapted to break large food molecules into small ones which can travel in the blood to cells and are used for life processes. ▪ Parts of the digestive system: The main organs that make up the digestive system (in order of their function) are the mouth, oesophagus, stomach, small intestine, large intestine, rectum and anus. Helping them along the way are the pancreas, gall bladder and liver. 	<ul style="list-style-type: none"> ▪ Art and design- students to take part in a project that outlines important information about this topic. It could be a drawing of the digestive system, or a poster about different food groups ▪ ICT researching information about these topics and writing down notes ▪ Watching a bitesize video of this topic ▪ Comprehension ▪ PSHE- health 	<ul style="list-style-type: none"> ▪ Assess the students abilities to see the art task through to the end (as it would go over a few weeks) ▪ Assess the quality of the presentations of art project ▪ Formative assessment to ensure learning is taking place throughout the half term ▪ Holistic assessment throughout the full half term
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<p align="center">YEAR 11 SCHEME OF WORK</p>				
	<p align="center">Topic Overview</p>	<p align="center">Learning Outcomes</p>	<p align="center">Minimum Core Skills</p>	<p align="center">Assessment and Tracking</p>
<p>Y11 Term CP4 Mar-Apr (6 weeks)</p>	<p>Physics-Sound and Light</p>	<ul style="list-style-type: none"> ▪ Use ray diagrams to model how light passes through lenses and transparent materials: When a light ray meets a different medium, some of it is absorbed and some reflected. For a mirror, the angle of incidence equals the angle of reflection. The ray model can describe the formation of an image in a mirror and how objects appear different colours. When light enters a denser medium it bends towards the normal; when it enters a less dense medium it bends away from the normal. Refraction through lenses and prisms can be described using a ray diagram as a model. ▪ Relate changes in the shape of an oscilloscope trace to changes in pitch and volume: Sound consists of vibrations which travel as a longitudinal wave through substances. The denser the medium, the faster sound travels. The greater the amplitude of the waveform, the louder the sound. The greater the frequency (and therefore the shorter the wavelength), the higher the pitch. 	<ul style="list-style-type: none"> ▪ Team work ▪ PSHE ▪ Mathematics ▪ Physical – movement ▪ Art and design- explaining the changes in shapes that they see 	<ul style="list-style-type: none"> ▪ Assess student engagement during experiments ▪ Holistic observations- ask students to each look after a group of resources each. Ask them to keep a head count and return them all at the end. See if students have the responsibility skills to manage this

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<p>Y11 Term CP5 May-Jun (6 weeks)</p>	<p>Chemistry- Solid Liquid and Gas</p>	<ul style="list-style-type: none"> ▪ Relate the features of the particle model to the properties of materials in different states: Properties of solids, liquids and gases can be described in terms of particles in motion but with differences in the arrangement and movement of these same particles: closely spaced and vibrating (solid), in random motion but in contact (liquid), or in random motion and widely spaced (gas). Observations where substances change temperature or state can be described in terms of particles gaining or losing energy. ▪ Safety and HAZCHEM: Recognise chemical labelling - 1 hour ▪ Understand safety ▪ Demonstration - Oxidising chemical KMnO₄ and Glycerine ▪ Corrosive, Toxic, Irritant/ Harmful, Environmental danger, Explosive, Oxidising, radioactive - TERMS ▪ Behaviour and safety 	<ul style="list-style-type: none"> ▪ Health and safety ▪ Reading important information about the three materials ▪ ICT conduct market research on facts about the three materials ▪ Communication skills- keeping each other safe when working with chemicals 	<ul style="list-style-type: none"> ▪ Observations of students and if they are able to keep themselves and others safe when working with different chemicals. ▪ Observe concentration levels when watching larger experiments via video (IE YouTube) ▪ Revision and recap on recent terms- highlighting any gaps
<p>Y11 Term CP6 Jun-July (6 weeks)</p>	<p>Biology- The reproductive system</p>	<ul style="list-style-type: none"> ▪ Reproductive Organs- male and female ▪ Fertilisation and Gestation- if an egg is fertilised it settles into the uterus lining. The length of time and the key stages in development of a foetus ▪ The menstrual cycle: lasts approximately 28 days. The menstrual cycle prepares the female for pregnancy and stops if the egg is fertilised by a sperm. ▪ The placenta and nutrition: the developing foetus relies on the mother to provide it with oxygen and nutrients, to remove waste and protect it against harmful substances 	<ul style="list-style-type: none"> ▪ Skills to help manage nerves and exam pressures ▪ Gaining experience in timed tests- managing time effectively ▪ Reading, processing questions and answering them ▪ Writing answers, collating work outs/sums to get to the answers ▪ Life skills- managing personal impulses in an examination room ▪ Mindfulness- coping strategy, managing breathing in a 	<ul style="list-style-type: none"> ▪ Summative assessment- simple revision tests for what has been taught throughout other terms. Due to the nature of the students they will struggle to retain all the information learned, so it will be a good fact find to see which areas they are strongest, and highlight progress in these areas as a boost of confidence and self-esteem

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