Cliff Park ORMISTON ACADEMY

Progression Grid 2020: Subject

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Pre Year 7						

The main focus of KS2 (lower years) is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out. At KS 2 (upper years), students should be deepening their understanding of a wide variety of scientific ideas involving more abstract ideas and continuing to develop working Scientifically skills through the scientific content included in the Programme of Study.

Intent

Students learn science because it provides them with transferable academic, practical and analytical skills which can be used throughout life. It allows students to make informed decisions as well as opening doors to higher education and beyond.

Knowledge and content are delivered thematically which builds upon the main skills and principles within the main scientific disciplines at KS3. At KS4, students are taught through subject specialisma in order to develop a wider appreciation of the knowledge, content and skills underpinning each scientific discipline.

Departmental values – respect, integrity, courteous, honest, motivated, polite/punctual/perseverance.

Interventions/support in place:

P6 sessions for key Y11 mini-cohorts from September 2021

Revision guides provided to all students in Cohort 2022

Modified unit order for Y11 to cover units missed due to Lockdown.

Y9 Forces and Y9 Respiration reviewed for Cohort 2023 before starting Y10 units – these units were delivered during Lockdown.

Changes 2122

Particles and Forces moved to Spring. ST moved to Summer. Movements made to ensure students had sufficient time to complete working scientifically and to ensure that a key unit like particles wasn't squeezed in. Will review for next year.

Change of assessment in EA

Re-do test EM/RD.

Assessment split in Y9 biology

Check R&D Test.

TIC Test

Moved ABS into Y10 and RoR into Y11 – based upon experience this year.

Add a unit on plants and photosynthesis from Y9 to fit into Y8

Change position of plants in Y9

Update for 2223

Remove interventions above

Y7-10 should now work ok.

WS - Remove final question from WS test.

RMS to add coin lesson to WS and JBU to add lessons on polystyrene cup.

Space – keep test to develop revision skills. Keep first term just space and WS

Put Particles into Spring Term for next year. Update tests. Forces moved into Spring Term 2122. Needs to be continued going forward. Y8 – units and tests work ok. EC – may just need to add an additional task to take up any extra time after doing test – see JBU. Could also be split into two – 1 person does all the generating electricity stuff.

Y9 – keep the assessment split in biology.

Y10 – NLM add an introduction to momentum section - PWL

Y11

			Remove all the units which should have been covered in Y10 and needed to be re-done in Y11 due to Covid. May need to review where HC goes next year. Check and streamline oil and atmosphere resources into one block. Put Y9 Respiration into Autumn Term after CAM. TIC in Spring term. Get rid of respiration in Y8 and add photosynthesis – call it Life Processes
Year 7			
Topic/Focus	Working Scientifically (WS) Space (SP)	Particles (PA) Cells (CE) Forces (FOR)	Reproduction (Repro) Separation Techniques (ST) Acids and Alkalis (AA) Microbes & Disease (MD)
Sequencing	Working scientifically is our introductory unit. This introduces all students to scientific safety and methodology which is used and developed over 5 years. Space develops the working scientifically skills and builds upon concepts covered at KS2. It begins our introduction to physics.	Cells is the building block of biology teaching and covers basic concepts e.g. healthy lifestyle which supports development of PSHE. Particles is the basis upon which physics and chemistry are built. This gives an introduction to these concepts which are refined and developed throughout the scientific career. Forces continue to develop working scientifically skills and build upon concepts introduced in Space.	Reproduction develops the concepts of puberty and plant reproduction which supports PSHE and builds upon the seven features of living things. Separation techniques build upon work done in the first term, developing and applying work from Particles and Working Scientifically, as well as developing key chemical knowledge. Acids and alkalis introduce students to basic chemistry concepts and reinforces working scientifically skills and skills introduced in Separating Techniques. Microbes is a new topic which builds upon key knowledge from Cells but introduces students to bacteria and viruses which is necessary for KS4.
Extended Learning	Whole school homework booklet.	Whole school homework booklet.	Whole school homework booklet.
Formal Assessment	WS – Test + Assessed Practical SP – Test + Assessed Practical	CE - Test PA – Test and Extended Writing FOR – Test + Assessed Practical	ST – Assessment + extended writing AA – Test
Year 8			
Topic	Energy (ENE) Reproduction and Birth (Repro) Electrical Circuits (EC)	Respiration & Digestion (RD) Electromagnets (EM) Earth & Atmosphere (EA)	Motion (MOT) Plants and Photosynthesis (PP) Metals & Materials (MM) Variation (VAR)

Sequencing	Energy is a key concept required for further study and also develops and applies work from Particles. Reproduction & birth builds upon concepts covered in year 7, giving students a second opportunity to access sex education. Electrical circuits builds upon a work in KS2 and develops an understanding of key knowledge which is required for future study. It also builds on the concepts introduced in Energy.	Respiration and digestion builds upon key concepts covered in Y7 and builds upon key features of all living things. Electromagnets continues to develop work on Electrical Circuits but also builds on KS2 content and continues to reinforce and develop working scientifically skills. Earth and Atmosphere continues to build on working scientifically principles as well as developing an understanding of key issues facing society.	Motion develops key themes linked to forces and begins to introduce key mathematical concepts as well as continuing to build working scientifically skills. Plants and photosynthesis is a unit building on plant cells in Y7 and bridging the gap between plants and ecosystems in Y9. Metals and Materials builds on work from KS2 and using some of the concepts introduced in Y7. It develops further the chemical nature of scientific study. Variation looks at the history of science as well as considering key issues facing society and builds upon prior work done on cells.
Extended Learning	Whole school homework booklet.	Whole school homework booklet.	Whole school homework booklet.
Formal Assessment	EC - Test Energy – Test + Assessed Practical Reproduction - Test	RD – Test + Extended Writing EM – Test + Assessed Practical EA – Test + Extended Writing	MOT – Test + Assessed Practical MM - Test

Year 9						
Qualification	AQA Trilogy					
Topic/Focus B - 3h/fortnight C - 2h/fortnight P - 3h/fortnight	B - Cells and Microscopy (CAM) C - Intro to Chemistry (Intro) P - Investigations & Maths (IM)	B - Transport in Cells (TIC) C – Intro/Chemical Analysis (CA) P - Sound (SL)	B - Transport in Cells (TIC) C - Chemical Analysis (CA) P - Light (SL)	B - Respiration (Resp) C - Chemical Analysis (CA) P - Forces (FOR)	B - Plants & Ecosystems (PE) C - Atomic Structure (AS) Bonding & Formula (BF) P - States of Matter (SoM)	B – Enzymes (ENZ 1) C - Types of Reaction (TR) P - Electricity (ELEC)
Sequencing	B - begin with cells as basic building blocks and includes a RP. This is followed by a unit of transport in cells focussing on the key transport features within a cell. This unit contains a complex RP which allows us time to develop the key skills required. C - basic recap of KS3 chemistry including more detail on separation processes and gas tests. CA		B - Respiration covers a key process within the body and builds upon work covered in Y8. This begins to introduce students to a more causal link approach to answering questions in biology. C - Introduces more complex ideas about the atom as the building block of matter and develops into bonding and writing formulae and equations. This is very conceptual -		B - Key construction unit on plants and feeding relationships, leading to an introduction on basic ecological sampling techniques which needs to be covered in summer term to allow this unit to be taught using practical methodology. Enzymes introduces students to key enzyme theory which builds upon particle theory covered in Y7 and	

	builds upon previous teaching in terms of particle theory and mixtures. Includes key work on chromatography including the RP which introduces basic mathematical concepts. P - Recap on key working scientifically terms which are needed for KS4 with a focus on some key maths skills. Sound uses a KS3 unit/concept to introduce key concepts about wave theory.		higher ability usually find this straightforward, but most students struggle. Doing this at this point starts the process of conceptual understanding and starts to give an indication as to those who may be able to cope with higher tier/Triple. P - Light uses a KS3 concept to introduce key concepts and reinforces work on wave theory. Construction unit introducing key ideas on forces introduced at KS3 and in place for KS4.		Y9 and begins the development of key components of the GCSE requirements. C – continues the conceptual work on bonding and gives students the tools to start Triple/higher tier chemistry in Y10. TR introduces key reaction types which are needed for KS4, introduces the Reactivity Series and gives practice of equation work. P - States of Matter and particle theory is crucial to further learning in both chemistry and physics. Includes key working scientifically concept of density which is also an important RP. Electricity builds and reviews prior work from KS3. These concepts are needed for further learning in both chemistry and physics units eg ATM, RM, Electrolysis.
Extended Learning	Whole school homework booklet.		Whole school homework booklet.		Whole school homework booklet.	
Formal Assessment	IM – Assessed Practical Intro – Test CAM - Test Tests kept in a personal folder and recorded individually and centrally.		Spring 1 – tests in Forces and Transport in Cells. Spring 2 - 1 x 20' test in biology, chemistry and physics based upon prior learning. Tests kept in a personal folder and recorded individually and centrally.		Summer 1 – 1 question on biology, chemistry and physics combined to give a single mark. Based upon prior learning. Summer 2 – 3 x 1h exams in each discipline. Tests kept in a personal folder and recorded individually and centrally.	
Year 10						
Qualification	AQA Trilogy					
Topic/Focus B - 3h/fortnight C - 3h/fortnight P - 3h/fortnight	B - Transport in Cells 2 (TIC 2) C - Bonding and Formula (BF) P - Atomic Structure (ATM)	B - Nervous System (NS) C - Reaction of Metals (RM) P - Newton's Law of Motion (NLM)	B - Disease & Immunity (DIM) C - Structures and Bonding (SB), Quantitative Chemistry (QC) P - Change of State (CoS)	B - Digestion (ENZ 2) C - Energy Changes (BB) P - Using Energy (UE)	B - Plant Structure and Photosynthesis 1 (PSP 1) C – Acids, Bases and Salts (ABS) P - Road Safety (RDS)	B - Adaptations, interdependence and competition (AIC) C - Periodic Table (PT) P - Mains Electricity (ME)
Sequencing	B - builds on Y9 and develops further the concepts of transport into cells. NS is a major physiological unit which requires prior knowledge from Cells and TIC. It also develops a more sequential approach to biology questions and contains a RP.		B - DIM introduces ways in which the body responds to pathogenic diseases. Digestion builds on enzyme work and transport work from Y9 to look at another key process. C – SB allows a recap of chemical bonding and how properties of structures are related to this. QC introduces the basic		B - PSP 1 builds on the initial photosynthesis work carried out in Y9 and introduces various plant tissues and contains key RP. AIC contains development of ecological sampling techniques within the summer term which is a key RP for paper 2 and links key ecological concepts relating to plants.	

	C - BF builds upon the atomic structure work in Y9 and develops the production of compounds and how this is shown through equations. This should be a swift revision unit for higher tier students and give middle ability students the chance to practice this work again. RM builds upon the reactivity series work covered in TR at the end of Y9 and reinforces bonding and equation work. P- ATM builds upon work done in Y9 and shares some content with chemistry, so is a useful reminder of key content covered in Y9 through a different scenario. This is also more abstract so content from other area is beneficial here. NLM is needed for RDS future learning, e.g. RDS. It builds upon Y9. RP is contained here, as the maths level increases.	mathematical concepts and introduces higher tier students to mole calculations. Energy changes looks at key reaction types and reinforces working scientifically skills through RP. Also introduces more mathematical concepts for higher tier. P - COS builds on units covered in Y9 - SoM and ATM. The maths content is now of higher level again so again, we need leave this until the pupils are ready to access this. UE is conceptually challenging, and the data handling and formula work is mathematically challenging so is left until late in Y10. It recaps and builds on work from Y8.	C – ABS reinforces work on pH scale covered in Y9. It contains a large amount of practical work an reinforces the separation techniques used in Y9. IT also introduces key definitions of acids and alkalis which are needed for PT unit. It also begins to use half ionic equations for HT students. Periodic Table builds upon prior work including atomic structure, properties of structures and reactivity. P - RDS builds on Newton's Laws of Motion. Conceptually this is difficult and deals with issues such as RTA casualties so not suitable for younger children. This is also done late in the year to ensure the maths ability is great enough for the majority to cope with the complexities of the equation work. ME builds upon the first unit in Y10 on electricity. It is reliant on some knowledge of real life and has some abstract ideas, so this is left until the end of Y10 as it requires an increased level of maturity.
Extended Learning	Tasks available for each unit. Set at the discretion of the individual teacher.	Tasks available for each unit. Set at the discretion of the individual teacher.	Tasks available for each unit. Set at the discretion of the individual teacher.
Formal Assessment	Autumn 2 - 1h assessment consisting of 1 x 20' test in biology, chemistry and physics based upon prior learning from both Y9 and Y10 – tiered. Data used to inform and review groupings.	Spring 2- 1h assessment consisting of 1 x 20' test in biology, chemistry and physics based upon prior learning from both Y9 and Y10 – tiered. Data used to inform and review groupings	Summer - 3 x 1h papers at both tiers. Data used to inform and review groupings.

Year 11						
Qualification	AQA Trilogy - Order of units differs slightly for those groups containing Triple Science students.					
Topic/Focus B - 3h/fortnight C - 3h/fortnight P - 3h/fortnight	B – Plant structure and photosynthesis 2 (PSP 2), Digestion (ENZ 2) C - Rate of Reaction (RoR), Structures and Bonding (SB) P - Mains Electricity (ME), Current and voltage (IV)	B - Circulation, breathing & Respiration (CBR) C - Acids, bases and salts (ABS) P - Waves (WAV)	B - Genetics, variation and evolution (GVE), Hormonal Control (HC) C - Oil (OIL), Atmospheric Chemistry (AC), Water (WAT) P - Change of State (CoS), Magnetism and Electromagnetism (MAG)	B - Adaptations, interdependence and competition (AIC), Humans and the Environment (HIE) C - Equilibrium (EQM), Electrolysis (LYS) P - Motors (MOT)		
Sequencing	B – PSP 2 builds upon concepts covered in Y9 and Y10. It allows the RP from Y9 to be revisited and		B - GVE contains a lot of ethical concepts and requires a high degree of maturity for this to be			

	further develops the concepts of plant processes utilising work covered in chemistry. Digestion is being taught here to ensure paper 1 coverage pre-mock. This would normally be taught in Y10, but lack of practical time during Lockdown made this difficult as it contains 2 major required practicals. CBR builds on prior knowledge of organisation and processes using all concepts covered in Y9 and Y10. It also covers key concepts on non-communicable diseases and allows a link back to disease covered in Y10. C – RoR and SB are normally taught in Y10, but these were units which weren't covered as a result of Lockdown. SB is required pre-mock exams for paper 1. RoR introduces key practical concepts which are required for paper 2. Both units are required to support further learning. ABS builds on prior knowledge and develop more higher tier concepts with regards to equations, so some academic maturity is required. P – ME is usually taught in Y10, but Lockdown has caused it to be re-scheduled. It links well to IV and will cover the main aspects of Electricity. The conceptual and terminology requirements build on work covered in the previous units. The RP is a major one with many facets. Waves is abstract and is best done using everyday knowledge so is left until Y11. The maths skills are also challenging. This involves quite a complex RP which requires skills and mathematical concepts from previous years.	covered effectively, hence it is left until the end of Y11. HC utilises a number of key concepts from previous units and allows a review of NS and TIC 1. Introduce key higher tier content. Although the RP for AIC was carried out in Y10, much of the theory will be covered in conjunction with HIE which will ensure all the ecological and environmental aspects of the specification are covered and build upon prior work on plants and in chemistry. C - Oil is an important unit as it develops concepts covered in Y9 and allows Working Scientifically skills to be developed in preparation for the final exam. This unit also contains content on global climate change, which is the cornerstone of this paper and links together challenging concepts, life cycle assessments, for example. AC looks at the evolution of the atmosphere and the impact of global climate change on this. It also covers key content which is required for the biology course. Water also brings together key concepts covered in previous units and covers the final RP, so allowing other mathematical concepts to be revisited. Both LYS and EQM are very challenging for Foundation Tier students, so they are left towards the end to provide a vehicle for revision and allows for increased academic maturity. EQM also has to be taken much further at higher tier and requires a high degree of higher-level thinking to be able to fully appreciate this work. P – CoS should have been covered in Y10. This was not covered due to Lockdown. It revisits and builds on units covered in Y9 - SoM and ATM. The maths content is more challenging and will allow for revision of these major concepts. Magnetism is the final unit for foundation tier and allows many working scientifically concepts to be covered before the exam. Motors is the final higher tier concept		

			which relies on students having covered electricity and magnetism in advance.			
Extended Learning	Tasks available for each unit. Set at the discretion of the individual teacher.		Tasks available for each unit. Set at the discretion of the individual teacher.			
Formal Assessment	Autumn 1 – assessment based upon units covered in first half term to provide a focus for revision. Tiered. Data used to inform tier choice in mocks.	Mock exam - data benchmarked to previous exam series and used to inform tier choice.		Mock exam - data benchmarked to previous exam series and used to inform tier choice.		
Post Year 11						
Further Education/training in: 'A' level sciences or Level 3 scientific qualifications				Employment in: NHS, engineering, offshore work, teaching - science subjects have skills which are transferable to many aspects of work.		