



	CREST Awards	Biology revision	Biology transition	Physics revision	Physics transition	Chemistry revision	Chemistry transition
Key concepts	<p>Students work independently or in groups to plan and run a project addressing a real-world STEM problem.</p> <p>The project process develops enquiry, problem-solving and communication skills. CREST Bronze can be used by students to enhance their UCAS personal statements.</p>	<p>Topics include: cells and organisation, the skeletal and muscular systems, the particulate nature of matter, photosynthesis, cellular respiration, nutrition and digestion, gas exchange systems, reproduction, health, relationships in an ecosystem, inheritance, chromosomes, DNA and genes.</p> <p>Working Scientifically material covers the scientific method, accuracy, estimates and peer review.</p>	<p>This unit covers some basic themes in biology that will be developed in students' GCSE science courses. These themes include the different kinds of diseases, nervous and hormonal control systems, ecological sampling, and diffusion and osmosis. A section on testing medicines provides an opportunity to study more of the scientific method and to look at the analysis of continuous datasets.</p>	<p>Topics include: physical changes, particle model, pressure in fluids, energy in matter, space physics. Calculation of fuel uses and costs, energy changes and transfers, changes in systems, describing motion, forces, balanced forces, forces and motion, observed waves, sound waves, energy and waves, light waves, magnetism, space physics, static electricity, current electricity.</p> <p>Working Scientifically material covers the scientific method, presenting information, presenting reasoned explanations and evaluating data.</p>	<p>This unit looks at some concepts in science that students will encounter during their GCSE studies.</p>	<p>Topics include: Separating substances, chemical reactions, physical and chemical, the periodic table and Earth and atmosphere.</p> <p>Working Scientifically material covers accuracy, precision and repeatability, experimental skills, and SI units and IUPAC conventions.</p>	<p>This unit covers some basic themes in chemistry that will be developed in students' GCSE science courses. This includes an introductory look at ions (and ionic bonding), energy changes in chemical reactions, rates of reaction, balanced symbol equations and equilibria. The idea is to very gradually introduce some of the main concepts that students will meet in their further study, allowing confidence to be developed slowly but surely.</p>
Themes	Empowering students to work like real scientists.	Consolidation of Y7/8	Disease	Consolidation of Y7/8	Weather phenomena.	Consolidation of Y7/8	Art
Challenge	Outcomes, questioning, tasks and resources in all lessons. Regular progress checks.						
Support							
Literacy focus	Presenting information in a variety of ways.	Keywords and spellings	Identify command words and what they mean. Respond	Keywords and spellings	Answering extended writing GCSE questions.	Keywords and spellings	Answer different types of short answer question.



			appropriately to command words.				
Numeracy focus	Collecting and presenting qualitative and quantitative data to prove/disprove their hypotheses.		Understand the terms mean, mode and median. Calculate areas of triangles and rectangles, surface areas and volumes of cubes.		Scatter diagram to identify a correlation between two variables. Translate information between graphical and numeric form. $y = mx + c$ represents a linear relationship. Plot two variables from experimental or other data Determine the slope and intercept of a linear graph.		Recognise expressions in standard form. Translate information between graphical and numeric form. Determine the slope and intercept of a linear graph.
Cross-curricular links	Technology and maths – STEM project.		History – improving health, hygiene in the UK and across the world.		D&T – testing new designs		Art – chemical substances in artists' materials Art – frescos and restoration
SMSC & MBV	Working in groups.		Considering the responsibility of all countries to assist in controlling potential pandemics.				
ASSESSMENTS							
Out of school learning	N/A	N/A	N/A	N/A	N/A	N/A	



<b>CREST Awards</b>			
<b>Lesson</b>	<b>Key concepts</b>	<b>Learning outcomes</b>	<b>Differentiation</b>
1	Project introduction and research	Provide a real-life experience of 'being a scientist. Allow students to experience the project process. Improve enquiry, problem solving and communication skills.	<p>Challenge: students to lead their group and drive the scientific enquiry of the project.</p> <p>Support: greater teacher input and guidance. Use of the science investigation planning sheet.</p>
2	Project research and development (methodology, results tables, equipment sourcing)	Students work independently to plan and organise a scientific project that meets the CREST Criteria.	
3	Project research and development (methodology, results tables, equipment sourcing)	Students work independently to plan and organise a scientific project that meets the CREST Criteria.	
4	Project practical	Students implement a clear strategy for the project. Students actively seek our appropriate resources.	
5	Project practical	Students implement a clear strategy for the project. Students actively seek our appropriate resources.	
6	Project practical	Students implement a clear strategy for the project. Students actively seek our appropriate resources.	
7	Project review (evaluation, conclusion and preparation of presentation)	Students indicate their own role in the project and reflect on what they have learnt. Students explore the direct and indirect implications of their work.	
8	Project presentations	Students clearly communicate their broad aim and specific objectives; analyse facts and develop original solutions; show clear communication skills and consider broader implications of their project.	



Physics revision			
Lesson	Key concepts	Learning outcomes	Differentiation
1	Fluids, Energy and, Earth and Space.		Outcomes, questioning, tasks and worksheets in all lessons.
2	Energy and energy transfer	Identify sources of energy and know the law of the conservation of energy Describe the law of conservation of energy using examples Explain energy transfer using a Sankey diagram	
3	Forces and motion	Describe balanced and unbalanced forces Explain how forces help things move	
4	Waves (sound/energy/light)	Explain the difference between longitudinal and transverse waves Describe sounds waves and light rays	
5	Magnetism	Explain the difference between gravitational fields, magnetic fields and electric fields	
6	Machines	Explain how machines can be used to move things Compare series and parallel circuits	



Physics transition			
Lesson	Key concepts	Learning outcomes	Differentiation
1	Differences	Recall what is meant by temperature differences Describe how temperature differences can cause convection currents State the meanings of latent heat and specific heat capacity	Outcomes, questioning, tasks and worksheets in all lessons.
2	Fields	Recall what is meant by a field Understand how fields are used in physics Model force fields using diagrams and interpret them	
3	Cause and effect	Recall that gravity is a force that acts between any two objects with a mass Identify action-reaction pairs in simple situations Apply the cause and effect to everyday occurrences	
4	Links between variables	Identify linear and proportional relationships from graphs Develop skills in representing scientific data graphically Draw graphs from given data	
5	Models	Identify models in science Describe the particle model Explain pressure, diffusion and Brownian motion	



<b>Biology revision</b>			
<b>Lesson</b>	<b>Key concepts</b>	<b>Learning outcomes</b>	<b>Differentiation</b>
1	Cells, systems and movement	To know what cells are and how they are organised Describe different specialised cells and adaptations	Outcomes, questioning, tasks and worksheets in all lessons.
2	Other organ systems	Define the keywords: organelle, cell, tissue, organ, organ system and organism. Give examples of the above keywords. Explain the hierarchy of organisation in multicellular organisms.	
3	Reproduction and health	Describe reproduction in humans and plants, and know the effects of recreational drugs on behaviour, health and life processes	
4	Energy in ecosystems (photosynthesis, respiration, cycles)	Know the word equations for photosynthesis, aerobic and anaerobic respiration Discuss the differences between aerobic and anaerobic respiration Explain the interdependence of organisms in an ecosystem	
5	Genetics and inheritance	Know why individuals and species have different characteristics, and why some are more likely to survive	



<b>Biology transition</b>			
<b>Lesson</b>	<b>Key concepts</b>	<b>Learning outcomes</b>	<b>Differentiation</b>
1	Diseases	Describe the relationship between health and disease Describe different types of diseases (including communicable and non-communicable diseases) Describe the interactions between different types of diseases	Outcomes, questioning, tasks and worksheets in all lessons.
2	Control systems	Identify the sense organs needed to respond to change Describe the role and organisation of the nervous system Explain the importance of the coordination of impulses by the brain in our responses to changes in the environment Analyse the differences between the nervous and endocrine systems	
3	Testing Medicines	Identify why animals are used for testing drugs Describe the process of drug testing Explain ethical issues surrounding the testing of drugs on animals	
4	Ecology	Recall the names of various sampling techniques Describe how different sampling techniques work Explain why samples need to be taken at random when collecting distribution data	
5	In and Out	Define the term osmosis Explain how surface area:volume ratio affects organisms Predict what happens to plant and animal cells when placed in different solutions	



Chemistry revision			
Lesson	Key concepts	Learning outcomes	Differentiation
1	Separating substances	Define the key terms, including mixture, soluble, dissolves, condenses and evaporates. Describe mixtures, diffusion, distillation and filtration. Explain the different ways that we can separate substances.	Outcomes, questioning, tasks and worksheets in all lessons.
2	Chemical reactions	Describe different reactions, including energy release and how to speed up chemical reactions. Explain what happens in a variety of chemical reactions.	
3	Physical and chemical changes	Describe the difference between chemical and physical changes Explain the difference between a chemical change and a chemical reaction	
4	The periodic table	Describe elements as metals and non-metals Describe the periodic table and how elements are arranged. Explain how the periodic table can be used to predict physical and chemical properties of certain elements.	
5	Earth and atmosphere	Describe the structure of the earth Describe and explain the importance of recycle for the earth	





Chemistry transition			
Lesson	Key concepts	Learning outcomes	Differentiation
1	Ions	Explain the difference between metallic and ionic bonding Know the charges of protons, neutrons and electrons	Outcomes, questioning, tasks and worksheets in all lessons.
2	Energy transfer	Represent energy transfers using diagrams and describe what happens to wasted energy in energy transfers Interpret diagrams that represent energy transfers and explain, using examples, that energy is conserved. Give examples of energy being transferred between different stores.	
3	Rates of reaction	Explain how reaction rates can be changed? How does concentration, temperature and surface area affect reaction rates?	
4	Chemical equations	Recall the symbols for certain elements Describe the importance of balancing equations with reference to numbers Demonstrate how to calculate balanced chemical equations	
5	Equilibria	Explain what dynamic equilibrium is What is meant by a reversible reaction	