Ruislip High School

Subject: Science

Year 7	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	• How Science Works • Biology: Living organisms • Chemistry: Matter • Physics: Energy • *Let's think science*		• Biology: Reproduction and genetics • Chemistry: Physical and chemical changes • Physics: Space • *Let's think science*		• Biology: Interdependence • Chemistry: Acids and alkalis • Physics: Forces • *Let's think science*	
Key Content and Skills	• How to stay safe in the science lab • The names of key pieces of equipment • How to carry out a valid scientific experiment • How to draw graphs • Cells, tissues, organs and organ systems • States of matter, diffusion and gas pressure • Energy stores and energy resources • *To be able to identify variables and relationships between variables* • *To be able to write a method*		• Fertilisation, menstrual cycle, puberty and plant reproduction • Inheritance and continuous and discontinuous variation • Physical and chemical changes, solubility and separation techniques • Atoms, elements, compounds and mixtures • The solar system, seasons, phases of the moon, eclipses and telescopes • *To be able to classify information into groups and apply ratios and probability*		• Food chains and webs, bioaccumulation and predator- prey relationships • Acids and alkali, indicators, pH scale, making salts and neutralisation • Forces, mass, Weight, air resistance, friction and pressure. • *To be able to apply inverse probability to different examples*	

Assessment	Each student will complete: ● 3x mastery quizzes ● 2x teacher-assessed tasks (choice from living organisms, matter and energy) ● Yr7 cumulative assessment 1	Each student will complete: ● 3x mastery quizzes ● 2x teacher assessed tasks (choice from physical and chemical changes, reproduction and genetics, and space) ● Yr 7 cumulative assessment 2	Each student will complete: ● 3x mastery quizzes ● 2x teacher assessed tasks (choice from interdependence, acids and alkali & forces) ● Yr 7 cumulative assessment 3
How can students prepare beyond the classroom?	Students should: ● Find out what scientists do in real life - what kinds of scientists are there? ● Refresh their memory about how science investigations are done in school, especially the words 'input variable' and 'outcome variable'. Once the term has started students should: ● Learn the spellings and definitions of the keywords for the topic using the keyword glossaries/ knowledge organisers ● Revise topics using KS3 BBC Bitesize material online ● Revise the topics using the online textbook found on Kerboodle Username example: lhide (first initial followed by surname) Password example : lhide (first initial followed by surname OR the one you have reset it to) Institution code: uht6 ● Use exercise books to consolidate	Students should: ● Research our solar system and look up simple chemical reactions on the internet. Once the term has started students should: ● Learn the spellings and definitions of the keywords for the topic using the keyword glossaries/ knowledge organisers ● Revise topics using KS3 BBC Bitesize material online ● Revise the topics using the online textbook found on Kerboodle Username example: lhide (first initial followed by surname) Password example : lhide (first initial followed by surname OR the one you have reset it to) Institution code: uht6	Students should: ● Research different forces and how forces affect everyday scientific examples ● Look up simple chemical reactions on the internet ● Research different ecosystems and how plants and animals are adapted to survive ● Watch clips relating to the topics on *BBC Bitesize* KS3 Science https://www.bbc.co.uk/bitesize/subjects/zng4d2p Once the term has started students should: ● Learn the spellings and definitions of the keywords for the topic using the keyword glossaries/ knowledge organisers ● Revise topics using KS3 BBC Bitesize material online ● Revise the topics using the online textbook found on Kerboodle Username example: lhide (first initial

	learning and revise Revision suggestions include: - Make revision flashcards - Make a mind map - Complete practice questions - Complete an online quiz to test yourself - Get a family member or friend to test knowledge of the key definitions/concepts		followed by surname) Password example : lhide (first initial followed by surname OR the one you have reset it to) Institution code: uht6

Year 8	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	● Biology: Digestive system ● Chemistry: Types of reactions ● Physics: Electricity and magnetism ● *Let's think science*		● Biology: Microbes and inheritance ● Chemistry: The periodic table and metals ● Physics: Waves ● *Let's think science*		● Biology: Biological reactions ● Chemistry: The Earth and climate ● Physics: Forces and motion	
Key Content and Skills	● Food groups and food tests ● The digestive system and organs ● Enzymes ● Movement of substances ● Atoms in chemical reactions ● Chemical reactions and burning fuels ● Thermal decomposition, exothermic and endothermic reactions ● Electricity, current and circuits ● Conductors and insulators		● Microbes and immunity ● Vaccinations and antibiotics ● Organ donation and stem cells ● Stem cells ● Effects on health ● Inheritance, evolution and extinction ● The periodic table, metals and non-metals ● Trends in group 1, 7 and 0 ● Reactivity series and displacement		● Respiration, fermentation, breathing and gas exchange ● Photosynthesis in plants, uses of sugars and stomata for transport ● Structure of the Earth ● Different types of rocks ● The rock cycle and the atmosphere ● Effects of climate changes ● The Earth's resources and recycling ● Forces and their effects, pressure and	

	• Voltage and resistance • Magnets and electromagnetism • *Making predictions, reasoning probability and correlations*	• Extraction of metals • Waves, light and colours • Reflection and refraction • The speed of sound, hearing and changing sounds • *Understanding formal models and compound variables*	friction • Speed and distance-time graphs • Hook's law and moments
Assessment	Each student will complete: • 3x mastery quizzes • 2x teacher assessed tasks (choice from digestive system, types of reactions and electricity and magnetism) • Yr8 cumulative assessment 1	Each student will complete: • 3x mastery quizzes • 2x teacher assessed tasks (choice from microbes and inheritance, the periodic table and metals and waves) • Yr8 cumulative assessment 2	Each student will complete: • X3 mastery quizzes • 2x teacher assessed tasks (Choice from biological reactions, the Earth and climate and forces and motion) • Yr8 cumulative assessment 3
How can students prepare beyond the classroom?	Students should: • Learn the spellings and definitions of the keywords for the topic using the keyword glossaries • Revise topics using KS3 of BBC Bitesize material online • Revise the topics using the online textbook found on Kerboodle Username example: lhide (first initial followed by surname) Password example : lhide (first initial followed by surname OR the one you have reset it to) Institution code: uht6 • Use the topic sheet to check learning • Use exercise books to consolidate learning and revise	Students should: • Review their knowledge of chemical reactions from Year 7 • Research the Group 1 metals and their reactivity with water • Research different types of forces and their effects	Students should: • Recall Year 7 knowledge on the different types of waves and how they can be used in everyday life • Research different ecosystems and how plants and animals are adapted to survive • Research the meaning of motion in physics • Watch clips relating to the topics on *BBC Bitesize* KS3 Science https://www.bbc.co.uk/bitesize/subjects/zng4d2p

Year 9	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	**Biology:** ● B1 Cell structure and transport **Chemistry:** ● C1 Atomic structure **Physics:** ● P1 Conservation and dissipation of energy		**Biology:** ● B2 Cell division **Chemistry:** ● C2 The periodic table **Physics:** ● P3 Energy resources		**RHSE- relationships** ● starting out in romantic relationships ● capacity to consent ● preventing STIs ● contraception ● unplanned pregnancy and pregnancy choices ● relationship expectations ● **Biology** ● B3 - Organisation of animal and plant cells ● B16 - Adaptations and Interdependence	
Key Content and Skills	**Biology:** ● To know how to use a microscope properly ● To explain the difference between animal and plant cells ● To compare the three types of transport - osmosis, active transport and diffusion. **Chemistry:** ● To correctly label an atom ● To be able to tell the difference between ions and isotopes ● To balance equations **Physics:**		**Biology:** ● To explain the different stages of the cell cycle ● To evaluate the use of stem cells **Chemistry:** ● To describe the history of the periodic table ● To explain trends of the periodic table **Physics:** ● To describe the differences between non renewable and renewable energy with examples ● Explain the differences between renewable energy sources		**RHSE- relationships** ● How to be safe in relationships ● How to prevent STIs **Biology** ● To outline the stages of digestion with functions of organs ● To describe how enzymes work with examples ● To explain why certain animals and plants have certain adaptations ● To be able to describe how to use a quadrat and transect to measure abundance of a species	

	● To recall the 8 energy stores ● To correctly calculate energy using the correct equation		
Assessment	Each student will complete: ● 3x mastery quizzes (B1, C1 & P1) ● Teacher assessed task ● Yr9 cumulative assessment 1	Each student will complete: ● 3x mastery quizzes (B2, C2 & P3) ● Teacher assessed task ● Yr9 cumulative assessment 2	Each student will complete: ● 1x mastery quizzes (B3, B16) ● Teacher assessed task ● Yr9 cumulative assessment 3
How can students prepare beyond the classroom?	Students should: ● Revise KS3 knowledge using the KS3 BBC bitesize Once the term has started, students should: ● Use their keyword lists/ knowledge organisers to revise definitions and spellings for keywords for the topic ● Use exercise books to consolidate learning and revise ● Use the online kerboodle textbook (topics B1, C1, P1) ● Example username: lhide (first initial followed by surname) Example password: lhide (first initial followed by surname OR the password you set it to) Institution code: uht6 - Create flashcards for the topic - Create a mind map for the topic - Create ten questions with answers for the topic	Once the term has started, students should: ● Use their keyword lists/ knowledge organisers to revise definitions and spellings for keywords for the topic ● Use exercise books to consolidate learning and revise ● Use the online kerboodle textbook (topics B2, C2, P2) Example username: lhide (first initial followed by surname) Example password: lhide (first initial followed by surname OR the password you set it to) Institution code: uht6 - Create flashcards for the topic - Create a mind map for the topic - Create ten questions with answers for the topic	Once the term has started, students should: ● Use their keyword lists/ knowledge organisers to revise definitions and spellings for keywords for the topic ● Use exercise books to consolidate learning and revise ● Use the online kerboodle textbook (topics B3, P3) Example username: lhide (first initial followed by surname) Example password: lhide (first initial followed by surname OR the password you set it to) Institution code: uht6 - Create flashcards for the topic - Create a mind map for the topic - Create ten questions with answers for the topic

Year 10	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	**Combined Science** ● P2- Energy by heating ● B4 Organising plants and animals ● C3 Structure & bonding ● P4 Electric circuits ● B5 Communicable diseases ● C4 Chemical calculations ● P5 Domestic electricity **Triple Science:** **Biology:** ● B4 Organising plants animals ● B5 Communicable diseases ● B6 Preventing and treating diseases **Chemistry:** ● C3 Structure & bonding ● C4 Chemical calculations ● C5 Chemical changes **Physics:** ● P2- Energy by heating ● P3 Energy resources ● P4 Electric circuits ● P5 Domestic electricity		**Combined Science:** ● B6 Preventing and treating diseases ● C5 Chemical changes ● P6 Molecules and matter ● B7 Non communicable diseases ● C6 Electrolysis ● P7 Radioactivity **Triple Science:** **Biology:** ● B7 Non-communicable diseases ● B8 Photosynthesis **Chemistry:** ● C6 Electrolysis ● C7 Energy changes ● C8 Rates and equilibrium **Physics:** ● P6 Molecules and matter ● P7 Radioactivity		**Combined Science:** ● B8 Photosynthesis ● C7 Energy changes ● P8 Forces in balance ● B9 Respiration ● P9 Motion **Triple Science:** **Biology:** ● B9 Respiration ● B10 The Human Nervous System **Chemistry:** ● C8 Rates and Equilibrium ● C9 Crude oil and fuels ● C10 Organic reactions ● C11 Polymers **Physics:** ● P9 Motion ● P10 Forces & motion	
Key Content and Skills	**Combined Science** **Biology**		**Combined Science:** **Biology**		**Combined Science:** **Biology**	

	• Identify the four types of pathogens and describe how each of them can harm the body. • To label the heart and describe how each section carries out its role • To describe transpiration in plants after observing it during the required practical. **Chemistry** • Be able to explain the differences between ionic, covalent and metallic bonding • Describe features and properties of giant structures • Carry out calculations that are relevant to chemical equations **Physics** • Build and use electric circuits • Describe how the national grid works • Be able to identify wires in a plug and their function **Triple Science:** **Biology:** • To label the heart and describe how each section carries out its role • To describe transpiration in plants after observing it during the required practical.	• Describe how a vaccine works • Name the defence systems that the body has • Name a few non communicable diseases, how they occur and the risk factors associated **Chemistry** • Be able to write out reactions with metals and describe how they behave with different substances • Make a salt using appropriate techniques • Explain how electrolysis works and be able to write out half equations **Physics** • Plan a method to investigate density for regular and irregular objects. • Calculate density • Identify the differences of alpha, beta and gamma radiation • Calculate half life **Triple Science:** **Biology:** • Name a few non communicable diseases, how they occur and the risk factors associated • Write out the balanced symbol equation for photosynthesis • Describe which factors influence the	• Write out the balanced symbol equation for photosynthesis • Describe which factors influence the rate of photosynthesis and carry out a practical to investigate this **Chemistry** • Describe the difference between endothermic and exothermic • Calculate bond enthalpy **Physics** • Describe the centre of mass for objects • Draw parallelogram of forces • Analyse and explain speed-distance and velocity-time graphs **Triple Science:** **Biology:** • Explain the difference between aerobic and anaerobic respiration • Describe what role the liver plays in metabolism • Describe and explain how the nervous and hormonal system work • Describe features of the eye and the brain **Chemistry:**

	• Identify the four types of pathogens and describe how each of them can harm the body. • Correctly plate bacteria on agar and identify the colonies • Describe plant diseases and defences • Describe how a vaccine works • Explain the role of monoclonal antibodies **Chemistry:** • Be able to explain the differences between ionic, covalent and metallic bonding • Describe features and properties of giant structures • Carry out calculations that are relevant to chemical equations • Successfully carry out a titration. • Be able to write out reactions with metals and describe how they behave with different substances • Make a salt using appropriate techniques **Physics:** • Explain the difference between non-renewable and renewable energy with named examples. • Build and use electric circuits • Describe how the national grid works • Be able to identify wires in a plug and	rate of photosynthesis and carry out a practical to investigate this **Chemistry:** • Explain how electrolysis works and be able to write out half equations • Describe the difference between endothermic and exothermic • Calculate bond enthalpy • Calculate rate and explain how it can be influenced by factors. • Explain how equilibrium can shift dependent on conditions • Investigate rate using appropriate techniques and equipment **Physics:** • Plan a method to investigate density for regular and irregular objects • Understand and calculate Boyle's law • Calculate density • Identify the differences of alpha, beta and gamma radiation • Calculate half life • Explain the difference between nuclear fission and nuclear fusion. • Describe the centre of mass for objects • Calculate moments and resultant force • Draw parallelogram of forces	• Calculate rate and explain how it can be influenced by factors • Explain how equilibrium can shift dependent on conditions • Investigate rate using appropriate techniques and equipment • Explain how crude oil is split into useful hydrocarbons • Identify, draw and name different organic compounds • Describe condensation and addition polymerisation • Explain how DNA, amino acids and glucose are natural polymers **Physics:** • Analyse and explain speed-distance and velocity-time graphs • Calculate acceleration • Explain forces and braking • Calculate momentum • Identify safety features of cars

	their function ● Describe what electrical fields and charges are					
Assessment Year 10 Combined GCSE	Teacher assessed task	Yr 10 cumulative assessment 1	Teacher assessed task	Yr 10 cumulative assessment 2	Teacher assessed task	Yr 10 cumulative assessment 3
Assessment Year 10 Triple GCSE	Teacher assessed task	Yr 10 cumulative assessment 1 biology, chemistry, physics	Teacher assessed task	Yr 10 cumulative assessment 2 Biology, Chemistry, Physics	Teacher assessed task	Yr 10 cumulative assessment 3 Biology, Chemistry, Physics
How can students prepare beyond the classroom?	Students should: ● Revise the topics they studied in Year 9 using bbc bitesize or use the online kerboodle textbook (B1, B2, B3, C1, C2, P1 and P2) Example username: lhide (first initial followed by surname) Example password: lhide (first initial followed by surname OR the password you set it to) Institution code: uht6 - Create flashcards for the topic - Create a mind map for the topic - Create ten questions with answers for the topic Once the term has started, students should:		Students should: ● Use revision guides to pre-read before the lessons ● Visit BBC bitesize GCSE - revision notes, tests and videos https://www.bbc.com/bitesize/subjects/zrkw2hv ● Visit My GCSE Science - video tutorials providing support and recap https://www.my-gcsescience.com/ ● Use their keyword lists/ knowledge organisers to revise definitions and spellings for keywords for the topic ● Use exercise books to consolidate learning and revise ● Use the online kerboodle textbook Example username: lhide (first initial followed by surname)		Students should: ● BBC bitesize or freescience lessons ● complete past paper questions ● Use their keyword lists/ knowledge organisers to revise definitions and spellings for keywords for the topic ● Use exercise books to consolidate learning and revise ● Use the online kerboodle textbook Example username: lhide (first initial followed by surname) Example password: lhide (first initial followed by surname OR the password you set it to) Institution code: uht6 - Create flashcards for the topic - Create a mind map for the topic - Create ten questions with answers for	

	● Use their keyword lists/ knowledge organisers to revise definitions and spellings for keywords for the topic ● Use exercise books to consolidate learning and revise ● Use the online kerboodle textbook Example username: lhide (first initial followed by surname) Example password: lhide (first initial followed by surname OR the password you set it to) Institution code: uht6 - Create flashcards for the topic - Create a mind map for the topic - Create ten questions with answers for the topic	Example password: lhide (first initial followed by surname OR the password you set it to) Institution code: uht6 - Create flashcards for the topic - Create a mind map for the topic - Create ten questions with answers for the topic	the topic

Year 11	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	**<u>Combined Science:</u>** ● B10 The human nervous system ● B11 Hormonal control ● B12 Reproduction ● C8 Rates and equilibrium ● C9 Crude oil and fuels ● P10 Forces and motion ● P11 Wave properties ● P12 Electromagnetic waves		**<u>Combined Science:</u>** ● B13 Variation and evolution ● B14 Genetics and evolution ● B16 Organising the ecosystem ● B17 Biodiversity and ecosystem ● C10 Chemical analysis ● C11 The Earth's atmosphere ● C12 The Earth's resources ● P12 Electromagnetic waves		**<u>Combined Science:</u>** Revision and summer examination series **<u>Triple Science:</u>** Revision and summer examination series	

	Triple Science: **Biology:** ● B12 Homeostasis in action ● B13 Reproduction ● B14 Variation and evolution ● B15 Adaptation, interdependence and competition **Chemistry:** ● C12 Chemical analysis - required practicals ● C13 Chemistry of the atmosphere ● C14 The Earth's resources **Physics** ● P10 Forces and motion ● P11 Forces and pressure ● P12 Wave properties ● P13 Electromagnetic waves	● P13 Electromagnetism **Triple Science:** **Biology:** ● B17 Organising an ecosystem ● B18 Biodiversity and ecosystems **Chemistry:** ● C14 The Earth's resources ● C15 Using our resources **Physics** ● P14 Light ● P15 Electromagnetism ● P16 Space	
Key Content and Skills	**Combined Science:** ● Describe and explain how the nervous and hormonal system work ● Describe sexual and asexual reproduction ● Understand the basic principles of single gene inheritance ● Describe and explain factors which speed up chemical reactions ● Know what a hydrocarbon is and describe the structure and chemical properties of alkanes and alkenes	**Combined Science** ● Describe and explain the meaning of evolution and natural selection and give examples ● Describe single gene inheritance ● Understand feeding relationships ● Describe how organisms are adapted to their environment ● Compare analytical techniques to identify compounds ● Describe the evolution of the atmosphere of the earth over the	Exam practice

	● Know the properties of transverse and longitudinal waves ● Describe the uses and properties of EM waves **Triple Science:** **Biology:** **Describe and explain how the body responds to changing conditions** ● Describe sexual and asexual reproduction including the advantages and disadvantages of each ● Explain how water levels are controlled by the body ● Describe and explain the meaning of evolution and natural selection and give examples ● Describe single gene inheritance and explain what Mendel contributed to genetics ● Describe and explain theories of evolution including natural selection ● Describe how organisms are adapted to their environment and the relationships between organisms **Chemistry:** ● Describe and explain how chemists test analyse chemicals	history of the earth ● Consider the impact of a product on the environment over its lifetime ● Explain how a magnet behaves ● Know the properties of transverse and longitudinal waves ● Recall the electromagnetic spectrum and list uses of each **Triple Science:** **Biology** ● Describe how organisms are adapted to their environment ● Understand feeding relationships ● Explain how food is produced and how farming techniques are linked to the food chain **Chemistry** ● Explain how the atmosphere has changed over time ● Explain how we obtain resources and how we use them in everyday life **Physics** ● Describe the behaviour of lightwaves ● Explain how a magnet behaves ● Describe how a motor works ● Explain the formation and organisation of the Universe	

	● Describe the evolution of the atmosphere of the earth over the history of the earth ● Consider the impact of a product on the environment over its lifetime **<u>Physics</u>** ● Describe how forces interact ● Explain the factors which affect pressure ● Know the properties of transverse and longitudinal waves ● Describe the uses and properties of EM waves **<u>Physics</u>** ● Describe a force as a push or pull acting on an object due to an interaction with another force. ● Recall that speed is measured by the distance travelled in a certain time. ● Describe how reactions affect thinking distance, braking distance and stopping distance. ● Describe how a driver's reaction time can be affected by tiredness, drugs and alcohol and distractions. ● Explain how the braking distance of a vehicle can be affected by adverse road		

	and weather conditions and the poor condition of the vehicle					
Assessment **Year 11** **Combined GCSE**	Yr 11 October assessment -Biology paper 1 topics only	Yr 11 PPE paper 1's combined science biology, chemistry and physics - Chemistry and Physics paper 1 topics only		Year 11 Physics combined paper 2 PPE	In class paper 1 and paper 2	
Assessment **Year 11 Triple GCSE**	October cumulative assessment	Yr 11 PPE paper 1's biology, chemistry and physics		Yr 11 PPE paper 2 biology, chemistry and physics	In class paper 1 and paper 2	
How can students prepare beyond the classroom?	Students should: ● Read relevant chapters in their revision guides ● Read relevant sections on BBC Bitesize ● Use Seneca Learning to develop knowledge skills ● Use the kerboodle textbook		Students should: ● Using their revision guides and revision cards to consolidate lessons. ● BBC bitesize GCSE (AQA specification) - revision notes, tests and videos https://www.bbc.com/bitesize/subjects/zrkw2hv ● My GCSE Science - video tutorials providing support and recap https://www.my-gcsescience.com/		Students should: ● Revise and prepare for exams ● Complete as many past paper questions as possible	

Year 12	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2

What students are learning	**Biology:** ● Biological molecules ● Cells and cell division ● Enzymes ● DNA and RNA ● Transport across membranes ● The immune response **Physical Chemistry:** ● Atomic Structure ● Amount of Substance ● Bonding ● Energetics ● Redox ● Equilibria and Kc **Inorganic Chemistry:** ● Periodicity ● Group 2 alkaline earths ● Group 7 Halogens **Physics:** ● Particles ● Interactions ● Antimatter ● Quarks ● Wave particle duality **Waves:** ● Diffraction ● Interference ● Diffraction gratings	**Biology:** ● Exchange and transport in animals and plants ● The Circulatory system ● DNA, genes and protein synthesis ● Genetic diversity **Physical Chemistry:** ● Equilibria and Kc ● Kinetics **Organic Chemistry:** ● Intro to organic ● Alkanes ● Haloalkanes ● Alkenes ● Alcohols ● Organic analysis **Physics:** **Mechanics:** ● Equilibrium and moments ● Momentum & Impulse ● Collisions ● Conservation of Energy ● Hooke's Law ● Young Modulus **Electricity:** ● Circuits ● Component characteristics ● Emf and internal resistance	**Biology:** ● Populations in ecosystems ● Classification ● Energy transfers in ecosystems ● Nutrient cycles **Chemistry:** ● Introduction to organic chemistry ● Alkanes and haloalkanes ● Alkenes ● Alcohols ● Organic analysis ● Thermodynamics ● The rate equation and Arrhenius **Physics:** **Circular motion:** ● Centripetal force ● Centripetal acceleration **Simple harmonic motion:** ● Oscillating systems ● Energy in SHM system ● Resonance **Thermal Physics:** ● Brownian motion ● Ideal gases ● Kinetic theory

	• Polarisation **<u>Mechanics:</u>** • Scalars and vectors • Equations of Motion	• Resistivity	
Key Content and Skills	**<u>Biology:</u>** • To be able to use and interpret data collected for quantitative tests • Identify variables that must be controlled in their investigation into rate of reaction • Be able to calculate uncertainties in measurements and represent data in graphically • Be able to describe the structure and functions of carbohydrates, lipids, proteins, enzymes, water, ions, ATP and DNA • To compare and contrast eukaryotic and prokaryotic cells • To be able to calculate mitotic index • Be able to determine water potential of different plant tissues • To understand how the body recognises antigen and brings about phagocytosis • To discuss ethical issues associated with vaccinations and monoclonal antibodies **<u>Chemistry:</u>**	**<u>Biology:</u>** • Participate in dissections and explain gas exchange systems for a variety of organisms • Interpret information relating to the effects of lung disease on gas exchange and/or ventilation • Interpret data relating to the effects of pollution and smoking on the incidence of lung disease • Evaluate the way in which experimental data led to statutory restrictions on the sources of risk factors • Recognise correlations and causal relationships. • Interpret data relating to pressure and volume changes during the cardiac cycle • Analyse and interpret data associated with specific risk factors and the incidence of cardiovascular disease • Be able to use and set up a potometer to describe transpiration • Relate the base sequence of nucleic acids to the amino acid sequence of polypeptides, when provided with	**<u>Biology:</u>** • To be able to calculate gross primary productivity • To be able to devise investigations into the effect of named minerals on plant growth • To be able to understand the need to manage the conflict between human needs and conservation in order to maintain the sustainability of natural resources • Evaluate evidence and data concerning issues relating to the conservation of species and habitats and consider conflicting evidence • use given data to calculate the size of a population estimated using the mark-release-recapture method. • To describe different nutrient cycles and understand their importance to different organisms • To be able to classify organisms appropriately **<u>Chemistry:</u>**

	There are 2 exams papers for AS (Y12) Chemistry. The two links below provide a breakdown of each topic that is examined in each paper AS Paper 1 Exam breakdown AS Paper 2 Exam breakdown The key content and skills for each topic are listed on the specification which is on the link below. Scroll down to page 8 to find the list of topics detailed in the documents above. If you click the topic they will hyperlink to a page detailing all of the required learning **AQA Chemistry Specification 7404 7…** **Physics:** There are 2 exam papers for AS combining all sections covered up to the Easter break		suitable data about the genetic code ● To describe how variation occurs and its important in biodiversity ● To use data to calculate index of diversity **Chemistry:** For a student version of the specification (PLC) please click the link below. This is a tick sheet of all the required learning, topic by topic Year 1 PLC For further specific revision resources and links click the links below Revision Resources AS Paper 1 Revision Resources AS Paper 2 KS5 Useful Chemistry Resources **Physics:** Use the interactive plc found here to assess strengths and weaknesses and complete past paper questions set on Google Class.		For past paper practice questions listed topic by topic please click the two links below https://www.aqa.org.uk/subjects/science/as-and-a-level/chemistry-7404-7405/assessment-resources https://drive.google.com/drive/folders/1_P8Qr-dfwsMePvrXs9OASzF18IO-FNW0?usp=share_link https://drive.google.com/drive/folders/1S2RUxaBF1E0erCSYjRbTvvt5OinM93tc?usp=share_link **Physics:** Relate the areas of mechanics and waves so far studied to circular motion and thermal physics.	
Assessment **Year 12 Biology**	● Settling in assessment ● Cumulative MTA ● 2x Mastery	● 2x End of topic tests (Cells and Biological molecules)	● Cumulative long assessment ● 3X Mastery quizzes	● 2x End of topic tests ● 1x Mastery quiz	● 2x Cumulative MTA	● Full paper 1 and 2 (AS Level) ● 2x Mastery quizzes

	quizzes	• Cumulative MTA • 2x Mastery quizzes				
Assessment **Year 12 Chemistry**	• Settling in test • Amount of Substance EOT • Bonding EOT	• Energetics EOT • Redox Grp2 Grp7 EOT	• Equilibria Kc EOT • Full AS Paper 1	• Intro to organic and Alcohols EOT • Alkanes and Alkenes EOT	• Full AS Paper 1 and Paper 2	• Link to resources for whole year https://classroom.google.com/r/NTQ1MzYzMzc5ODUz/sort-last-name
Assessment **Year 12 Physics**	• Settling In Test • Quantum Phenomena	• Waves • Refractive Index • Cumulative	• Forces In Equilibrium • Motion • Newtons Laws • Momentum	• Work & Power • Electric Circuits • Resistivity	• Cumulative • Materials • Practical Electricity	• Circular Motion • SHM • Cumulative
How can students prepare beyond the classroom?	Students should: **Biology:** • Review their knowledge of GCSE Biology applicable to each new topic • Use lesson time for discussing difficulties encountered during pre-reading and for practice in applying new knowledge • Use their textbook and notes to review knowledge • Use the textbook to read the relevant content on the new topics • Use their PLCs and glossaries to check learning		Students should: **Biology:** • Review their knowledge of GCSE Biology applicable to each new topic • Use lesson time for discussing difficulties encountered during pre-reading and for practise in applying new knowledge • Use their textbook and notes to review knowledge • Use the textbook to read the relevant content on the new topics • Use their PLCs and glossaries to check learning		Students should: **Biology:** • Review their knowledge of GCSE Biology applicable to each new topic • Use lesson time for discussing difficulties encountered during pre-reading and for practise in applying new knowledge • Use their textbook and notes to review knowledge • Use the textbook to read the relevant content on the new topics • Use their PLCs and glossaries to check learning	

	<u>Chemistry</u>: ● Review their knowledge of GCSE chemistry applicable to each new topic. Consider using previous notes, revision guides and *BBC Bitesize* ● Ensure they pre-read the relevant sections in the textbook before coming to class ● Use lesson time for discussing difficulties encountered during pre-reading and for practise in applying new knowledge **<u>Physics</u>:** ● Use Kerboodle to consolidate knowledge ● Complete all “flip-learning” as set ● Complete all google class quizzes and make amendments as necessary	● Review the revision guide sections after every lesson and attempt the warm up and exam questions to self-assess topic understanding **<u>Chemistry</u>:** ● Review their knowledge of GCSE chemistry applicable to each new topic. Consider using previous notes, revision guides and *BBC Bitesize* ● Ensure they pre-read the relevant sections in the textbook before coming to class ● Use lesson time for discussing difficulties encountered during pre-reading and for practise in applying new knowledge **<u>Physics</u>:** ● Use the revision guides, exam questions and PLCs provided to test knowledge ● Research the bulk properties of materials ● Research uses of superconductors ● Use the Kerboodle knowledge quizzes and the weekly tasks set on google classroom to build your knowledge	**<u>Chemistry</u>:** ● Review their knowledge of GCSE chemistry applicable to each new topic ● Ensure they pre-read the relevant sections in the textbook before coming to class ● Use lesson time for discussing difficulties encountered during pre-reading and for practise in applying new knowledge **<u>Physics</u>:** ● Use flipperty flash cards for each topic ● Complete past paper examination questions ● Complete multiple choice growth tasks

Year 13	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	**Biology:** ● Homeostasis ● Photosynthesis ● Respiration ● Nervous system ● Survival responses **Chemistry:** **Physical chemistry:** ● Gaseous Equilibria Kp ● Acids and bases **Inorganic chemistry:** ● Transition metals ● Reactions of aqueous ions ● Period 3 elements and their oxides **Physics:** ● Thermal physics ● Gravitational fields ● Electric fields ● Astrophysics		**Biology:** ● Muscle structures ● Populations and Evolution ● Mutations and Gene Expression ● Genome projects and Gene technologies **Chemistry:** **Physical chemistry:** ● Electrode Potentials ● Transition Metals **Organic chemistry:** ● Aldehydes and ketones ● Carboxylic acids and derivatives ● Optical isomerism ● Aromatic chemistry ● Amines ● Polymers ● Amino acids, DNA and proteins ● Chromatography and NMR ● Organic synthesis **Physics:** **Nuclear Physics:** ● NZ Stability ● Inverse Square Law ● Mass-energy		● Revision	

		• Electron diffraction **Electromagnetism:** • Capacitors • Magnetic fields • Electromagnetic induction • Charges particles and accelerators • AC circuits	
Key Content and Skills	**Biology:** • To be able to identify environmental factors that limit the rate of photosynthesis • Evaluate data relating to common agricultural practices used to overcome the effect of these limiting factors. • To use chromatography to investigate the pigments isolated from leaves of different plants, eg, leaves from shade-tolerant and shade-intolerant plants or leaves of different colours. • To investigate the effect of a named factor on the rate of dehydrogenase activity in extracts of chloroplasts. • To investigate the effect of a named variable on the rate of respiration of cultures of single-celled organisms. • To investigate the effect of an environmental variable on the movement of an animal using either a choice chamber or a maze. • To understand the importance of	**Biology:** • To compare the structure, location and general properties of slow and fast skeletal muscle fibres • To calculate allele, genotype and phenotype frequencies from appropriate data using the Hardy–Weinberg equation. • To explain why individuals within a population of a species may show a wide range of variation in phenotype • To explain why genetic drift is important only in small populations • To explain how natural selection and isolation may result in change in the allele and phenotype frequency and lead to the formation of a new species • To explain how evolutionary change over a long period of time has resulted in a great diversity of species. • To relate the nature of a gene mutation to its effect on the encoded polypeptide.	**Chemistry:** For past paper practice questions listed topic by topic please click the two links below https://www.aqa.org.uk/subjects/science/as-and-a-level/chemistry-7404-7405/assessment-resources https://drive.google.com/drive/folders/1S2RUxaBF1E0erCSYjRbTvvt5OinM93tc?usp=share_link https://drive.google.com/drive/folders/1X2Y-yO9wuXTTSUffzKUB3NEmlVLiLF7D?usp=share_link **Physics:** The weekly tasks this term concentrate on multiple choice skills.

	receptors • To use information provided to predict and explain the effects of specific drugs on a synapse. • To interpret information relating to examples of negative and positive feedback. • Evaluate the positions of health advisers and the food industry in relation to the increased incidence of type II diabetes. **Chemistry:** There are 3 papers for the Y13 Chemistry A level Exam. Please click the links below to see the topics examined in each paper Paper 1 Exam breakdown Paper 2 Exam breakdown Paper 3 Exam breakdown The key content and skills for each topic are listed on the specification which is on the link below. Scroll down to page 8 to find the list of topics detailed in the documents above. If you click the topic they will hyperlink to a page detailing all of the required learning **AQA Chemistry Specification 7404 …** **Physics:**	• To evaluate the use of stem cells in treating human disorders. • To interpret data provided from investigations into gene expression • Evaluate appropriate data for the relative influences of genetic and environmental factors on phenotype. • To interpret information relating to the use of recombinant DNA technology • Evaluate the ethical, financial and social issues associated with the use and ownership of recombinant DNA technology in agriculture, in industry and in medicine • Be able to balance the humanitarian aspects of recombinant DNA technology with the opposition from environmentalists and anti-globalisation activists • To relate recombinant DNA technology to gene therapy. • Explain the biological principles that underpin genetic fingerprinting techniques • Interpret data showing the results of gel electrophoresis to separate DNA fragments • Explain why scientists might use genetic fingerprinting in the fields of forensic science, medical diagnosis, animal and plant breeding.	

	There are 3 exam papers for the A-level exam. Paper 1 is focused on Year 12 work; Paper 2 on Year 13 work and Paper 3 is focused on practical skills and the optional Astrophysics unit.		**Chemistry:** For a student version of the specification (PLC) please click the links below. These are tick sheets of all the required learning, topic by topic Year 1 PLC Year 2 PLC For further specific revision resources and links click the links below Revision Paper 1 Revision Paper 2 Revision Paper 3 KS5 Useful Chemistry Resources **Physics:** There are weekly revision tasks set on Google class as well the interactive plc. The weekly tasks are designed to improve confidence on Paper 3 questions and are mainly practical-style past papers.			
Assessment **Year 13 Biology**	• Full paper 1 • End of topic test (Ecology) • 2x Mastery quizzes	• X2 End of topic tests (Homeostasis and photosynthesis and respiration) • 1x Cumulative	• Combined paper 1 and 2 • 2x Cumulative MTA	• 2x End of topic tests (Organisms response to changes and Genetics, populations, evolution and ecosystems)	• Paper 3	

		• MTA • 2x Mastery quizzes				
Assessment **Year 13 Chemistry**	• Cumulative assessment in class • Acids EOT • Electrode Potentials EOT	• Transition Metals EOT • Aqueous Ions EOT	• Full A Level P1 • Carboxylic acids EOT • Aromatic EOT	• Polymers, Amino acids, DNA EOT • NMR and analysis EOT • Full Paper 2 • Full Paper 3	• Full papers 1, 2 & 3	Link to resources for whole year https://drive.google.com/drive/folders/1cNmeqD_qENok_iZUm7JY42sGedHkFOzm?usp=sharing
Assessment **Year 13 Physics**	• Full paper 1 • Further Mechanics MTA • Gravitation MTA	• Electric Fields MTA • Astrophysics MTA	• Full paper 1 • Combined paper 2 & 3 • Electromagnetism MTA	• Nuclear Physics MTA	• Full papers 1, 2 & 3	
How can students prepare beyond the classroom?	Students should: **Biology:** • Read around the topics, eg. New Scientist • Use the textbook to familiarise with the content • Review and update Year 12 PLC • Thoroughly revise Year 12 Biology as these new topics will build upon what was taught last year • Use lesson time for discussing difficulties encountered during pre-reading and for practise in applying new knowledge		Students should: **Biology:** • Review their knowledge of GCSE Biology applicable to each new topic • Use lesson time for discussing difficulties encountered during pre-reading and for practise in applying new knowledge • Use their textbook and notes to review knowledge • Use the textbook and notes to review knowledge • Use the textbook to read the relevant content on the new topics • Use their PLCs and glossaries to check		Students should: • Revise and prepare for exams	

	<u>Chemistry</u>: ● Review and update Year 12 PLCs ● Thoroughly revise Year 12 chemistry as these new topics will build upon what was taught last year ● Ensure they pre-read the relevant sections in the textbook before coming to class ● Use lesson time for discussing difficulties encountered during pre-reading and for practise in applying new knowledge **<u>Physics</u>:** ● Read around the topics, eg. New Scientist ● Use the Kerboodle textbook to familiarise with the content *Complete the weekly revision tasks set in Google Classroom	learning ● Review the revision guide sections after every lesson and attempt the warm up and exam questions to self-assess topic understanding **<u>Chemistry</u>:** ● Review and update Y12 PLCs for organic chemistry ● Thoroughly revise Yr 12 organic chemistry as these new topics will build upon what was taught last year ● Ensure they pre-read the relevant sections in the textbook before coming to class ● Use lesson time for discussing difficulties encountered during pre-reading and for practice in applying new knowledge **<u>Physics</u>:** ● Organise folders ● Revise Y12 work thoroughly ● Complete state and explain ppqs on google ● Research cyclotrons ● Research mass spectrometry ● Use the Kerboodle knowledge quizzes and the weekly tasks set on google classroom to build your knowledge	