Meadow Park School - Curriculum Map 2021-2022

Key Stage	Year Group	Subject	Teacher	Programme of Study
KS4	Year 11	BTEC Science	Rachel Lyon	Edexcel Pearson's BTEC Level 1/Level 2 in Principles of Applied Science (Code: 600/4787/2)

Autumn a	Autumn b	Spring a	Spring b	Summer a
Topic(s)	Topic(s)	Topic(s)	Topic(s)	Topic(s)
UNIT 2: Chemistry and Our Earth Unit 2C: Controlling industrial conditions Unit 2D: Affecting the environment	**UNIT 1: Principles of Applied Science** (Externally assessed exam unit)	**UNIT 2: Chemistry and Our Earth** Unit 2A: Chemical reactivity and bonding **Unit 3: Energy and Our Universe** Unit 3A: Ionising radiation	**Unit 3: Energy and Our Universe** Unit 3C: The final frontier	**UNIT 2: Chemistry and Our Earth** **UNIT 3: Energy and Our Universe** **Unit 4: Biology and Our Environment** **UNIT 1: Principles of Applied Science** (Externally assessed exam unit)
Assessment Tasks	Assessment Tasks	Assessment Tasks	Assessment Tasks	Assessment Task
Internally assessed **Unit 2C:** P6 - Describe the factors that can affect the rates of chemical reactions. P7 - Identify the number and types of atoms in balanced chemical equations. M5 - Explain how different factors affect the rate of industrial reactions. M6 - Explain the terms 'yield' and 'atom economy' in relation to specific chemical reactions. D4 - Analyse how different factors affect the rate and yield of an industrial reaction **Unit 2D:** P8 - Describe the human activities that affect the Earth and its environment. P9 - Describe natural factors that have changed the surface and atmosphere of the Earth. M7 - Discuss the extent to which human activity has changed the environment, in comparison to natural activity. D5 - Evaluate possible solutions to changes in the environment, occurring from natural or human activity.	**RECAP/REVISE UNIT 1(MOCK EXAM)** **Unit 1: Biology** * Comparing the structure of animal and plant cells. * Comparing specialised plant and animal cells. * Modelling the structure of DNA * Predicting genotypes and phenotypes. * Comparing parts of the nervous system. * Comparing parts of the endocrine system. * Comparing mechanisms of homeostasis. **Unit 1: Chemistry** * Modelling atomic structure. * Comparing atomic mass and atomic number. * Comparing elements, compounds and mixtures and using chemical formulae to represent them. * Comparing groups and periods in the Periodic Table. **Unit 1: Chemistry** * Investigating chemical reactions. * Representing chemical reactions with word equations and balanced symbol equations. **Unit 1: Physics** * Comparing forms of energy and describing energy transfers. * Calculating efficiency/ work done/ power. * Interpreting wave diagrams. * Calculating wave frequency and speed. * Modelling the EM spectrum. * Comparing characteristics of the waves in the EM spectrum. * Comparing renewable and non-renewable energy resources. • Exam Practice (applying knowledge on the above assessment tasks to answer exam questions). • **Mock Exam**	Internally assessed **Unit 2A:** P1 – Describe the physical and chemical properties of group 1 and 7 elements. P2 – Compare properties of ionic and covalent substances. P3 – Draw dot-and-cross diagrams of simple ionic and covalent substances. M1 – Describe trends in the physical and chemical properties of group 1 and 7 elements. M2 – Explain the properties of ionic and covalent substances. M3 – Describe the formation of ionic and covalent substances. D1 – Explain the trends in chemical properties of group 1 and 7 elements in terms of electronic structure. **Unit 3A:** P1 – Describe half-life in terms of radioactive decay. P2 – Describe the different types of ionising radiation. P3 – Describe the problems associated with the use of radioactive isotopes. P4 – Describe how controllable nuclear fission and fusion reactions are M1 – Use graphs to explain radioactive decay and half-life. M2 – Compare the benefits and drawbacks of using radioactive isotopes in the home or workplace. M3 – Describe the environmental impact of radioactive material from nuclear fission reactors released into the environment. D1 – Calculate the half-life of radioactive isotopes. D2 – Justify the selection of a radioactive isotope for a given use within the home or workplace. D3 – Evaluate the environmental impacts of a nuclear fission reactor accident, in terms of half-life.	Internally assessed **Unit 3C:** P8 – Describe the structure of the Universe and our Solar System. P9 – Describe the suitability of different methods for observing the Universe. P10 – Identify evidence that shows the dynamic nature of the Universe. M6 – Describe how the Universe and the Solar System were formed. M7 – Explain how evidence shows that the Universe is changing. D5 – Evaluate the evidence leading to the Big Bang theory of how the Universe was formed.	Externally assessed **RECAP/REVISE UNIT 1(EXAM)** Unit 1: Biology * Comparing the structure of animal and plant cells. * Comparing specialised plant and animal cells. * Modelling the structure of DNA * Predicting genotypes and phenotypes. * Comparing parts of the nervous system. * Comparing parts of the endocrine system. * Comparing mechanisms of homeostasis. Unit 1: Chemistry * Modelling atomic structure. * Comparing atomic mass and atomic number. * Comparing elements, compounds and mixtures and using chemical formulae to represent them. * Comparing groups and periods in the Periodic Table. Unit 1: Chemistry * Investigating chemical reactions. * Representing chemical reactions with word equations and balanced symbol equations. Unit 1: Physics * Comparing forms of energy and describing energy transfers. * Calculating efficiency/ work done/ power. * Interpreting wave diagrams. * Calculating wave frequency and speed. * Modelling the EM spectrum. * Comparing characteristics of the waves in the EM spectrum. * Comparing renewable and non-renewable energy resources. • **External Exam**

Personal Development/CEIAG	Personal Development/CEIAG	Personal Development/CEIAG	Personal Development/CEIAG	Personal Development/CEIAG
Career focus: Trip to Lush store to experience alternative Science related jobs. Career talk from a representative at Biograd (research centre) to consider jobs and career paths within the Health sector. **PD Focus: Health and Well-being** Consider the impacts that human activities such as increase in pollution caused by transport have on health conditions such as asthma. Research what measures could be taken to reduce impacts on health.	**Career focus:** Trip to Lush store to experience alternative Science related jobs. Career talk from a representative at Biograd (research centre) to consider jobs and career paths within the Health sector. **PD Focus: Health and Well-being** Discussion about exam stress. If possible arrange a session with Mrs Cortman (Therapist) to teach some relaxation techniques.	**Career focus:** Trip to Jodrell Bank or the Catalyst Museum to experience alternative Science related jobs. **PD Focus: Relationships** Discussion about the importance of developing positive relationships within the workplace. Discussion about how to do this/ prevent conflict/ maintain a professional relationship.	**Career focus:** Trip to Jodrell Bank or the Catalyst Museum to experience alternative Science related jobs. **PD Focus: Relationships** Discussion about the importance of developing positive relationships within the workplace. Discussion about how to do this when working in a small environment such as on a Space Station. Consider what qualities are important for individuals working on space stations or similarly stressful jobs that require you working closely with someone.	**Career focus:** Trip to the zoo or career talk from a professional linked to Animal Rescue like the RSPCA to experience careers within those sectors that students may not have [previously considered. **PD Focus: Living in the wider world** Researching potential wages from a range of careers and apprentice opportunities. Creating a budget sheet to explore potential earnings against essential living costs/ rent or mortgage…
Reading & Writing	Reading &Writing	Reading & Writing	Reading &Writing	Reading &Writing
Reading methods accurately/ recording information in conclusions clearly using the correct scientific terminology/ finding the correct definitions of key words and spelling them correctly in written explanations. Reading from a variety of research materials to highlight key comparisons about the effects of human activity on the environment/ writing comparisons in full sentences using punctuation and correct grammar.	Reading a variety of different styles of revision notes/aids to find the most suitable. Interpreting exam questions correctly. Recording answers to exam questions that include the correct key words and terminology. Practice at writing longer answers including the use of punctuation and grammar to complete 6 mark questions.	Using the correct terminology when writing conclusions for results/ reading research on the properties of ionic and covalent bonding and writing comparisons clearly spelling key words correctly. Researching nuclear disasters and highlighting key facts/writing in different styles (articles/reports etc.)/ recording information in tables clearly and neatly.	Reading from a range of research materials and highlighting key pieces of information about the solar system/ writing in different styles (bullet points/written reports etc.)/ using the correct terminology when writing about the Big Bang and Red Shift.	Reading a variety of different styles of revision notes/aids to find the most suitable. Interpreting exam questions correctly. Recording answers to exam questions that include the correct key words and terminology. Practice at writing longer answers including the use of punctuation and grammar to complete 6 mark questions.
Speaking & Listening	Speaking & Listening	Speaking and Listening	Speaking & Listening	Speaking & Listening
Listening to instructions during practical lessons and verbally relaying that information to working partners/ discussing practical results as a class/ listening to the ideas of other peers/ verbally evaluating methods.	Listening to revision methods/strategies and engaging in revision sessions. Sharing knowledge verbally as a group and feeling confident to ask questions.	Listening to class ideas from group practical tasks and sharing ideas verbally to help form conclusions/ using the scientific terminology during class discussions. Listening to class discussions about the dangers of radiation and the impacts of nuclear disasters/ verbally contributing thoughts and opinions about nuclear disasters.	Listening to information about the solar system and the Big Bang from internet clips and verbally sharing key facts with the class/peers/ discussing ideas about what will happen to our solar system in the future/ listening to the ideas of others.	Listening to revision methods/strategies and engaging in revision sessions. Sharing knowledge verbally as a group and feeling confident to ask questions.
Numeracy & Mathematical Reasoning	Numeracy & Mathematical Reasoning	Numeracy & Mathematical Reasoning	Numeracy & Mathematical Reasoning	Numeracy & Mathematical Reasoning
Using graphs to extrapolate information about industrial yields and optimum conditions/ using the correct units when analysing data. Reading scales accurately/ recording results using the correct units/ calculating averages accurately. Interpret graphs to find data to support statements about the impacts that human activities have on the environment.	Interpreting primary and secondary evidence. Using equations to calculate efficiency/frequency/probability of inheriting certain genotypes/ calculating atomic mass.	Interpretation of secondary and primary data to provide evidence for opinions. Interpreting data on radioactive decay to calculate half-life/ using the correct units when comparing radioactive properties.	Understanding how to use timelines to place events in chronological order/ using the correct units when comparing the temperatures, size and distances from the sun of different planets.	Interpreting primary and secondary evidence. Using equations to calculate efficiency/frequency/probability of inheriting certain genotypes/ calculating atomic mass.
Creative Media	Creative Media	Creative Media	Creative Media	Creative Media

Use a range of internet research sites to find information about industrial chemical reactions/ watch internet clips to see how chemical reactions happen. Watching sort clips showing how the environment and humans have altered the environment. Using power point to present research.	Use ICT to aid revision (BBC Bitesize or SENECA)	Use word/ power point to produce an article or presentation to compare key properties of chemicals. Using you tube clips to watch simulations of how nuclear fission and fusion reactions happen/ using the internet to research the impacts of nuclear disasters/ using word or power point to record information.	Using you tube clips to visualise the Big Bang and to show images taken from a range of telescopes in space/using the internet to research key facts about our Universe.	Use ICT to aid revision (BBC Bitesize or SENECA)

KEY SKILLS:

Stating/describing processes and concepts

Modelling processes and concepts

Explaining processes and concepts/ making comparisons

Following a method to carry out practicals and record accurate observations

Applying knowledge to answer questions/ make connections

Carrying out practical investigations

Analysing data/ forming conclusions

Using equations in calculations

Evaluating the reliability and validity of results

Rearranging equations to answer questions

Applying knowledge from investigations to prove/ disprove a statement (critical thinking)

Critically analysing theories