Meadow Park School - Curriculum Map 2021-2022

Key Stage	Year Group	Subject	Teacher	Programme of Study
KS4	**10**	**BTEC Science**	**Rachel Lyon**	**Edexcel Pearson's BTEC Level 1/Level 2 in Principles of Applied Science (600/4787/2)**

Autumn a	Autumn b	Spring a	Spring b	Summer a	Summer b
Topic(s)	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 2: Chemistry and Our Earth** Unit 2A: Chemical reactivity and bonding Unit 2B: Useful chemical products	**Unit 3: Energy and Our Universe** Unit 3A: Ionising radiation Unit 3B: Green electricity	**Unit 3: Energy and Our Universe** Unit 3C: The final frontier	**Unit 4: Biology and Our Environment** Unit 4A: Is survival in the genes?	**Unit 4: Biology and Our Environment** Unit 4B: How polluted is the environment? Completion of outstanding tasks from Unit 2 and Unit 3
Assessment Tasks	Assessment Tasks	Assessment Tasks	Assessment Tasks	Assessment Task	Assessment Tasks
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.	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 2B:** P4 – Describe how chemical substances are used based on their physical properties. P5 – Describe how chemical substances are used based on their chemical properties. M4 – Explain how physical and chemical properties of chemical substances make them suitable for their uses. D3 – Assess the suitability of different types of substance for a specified use.	Internally assessed **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. **Unit 3B:** P5 – Describe methods of producing a.c. and d.c. electricity. P6 – Use V = IR to predict values in electric circuit investigations. P7 – Describe how electricity is transmitted to the home or industry. M4 – Compare the efficiency and environmental impact of electricity generated by different sources. M5 – Assess, in qualitative terms, ways to minimise energy losses when transmitting electricity. D4 – Assess, in quantitative terms, ways to minimise energy losses either when transmitting electricity or when transforming electricity into other forms for consumer applications.	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.	Internally assessed **Unit 4A:** P1 – Describe the role of genes and the environment in variation P2 – Describe how characteristics are used to classify organisms. P3 – Describe the different ways in which organisms show interdependence. M1 – Explain the role of genes and the environment in evolution. M2 – Discuss the factors that affect the relationship between different organisms. D1 – Evaluate the impact of genes and the environment on the survival or extinction of organisms.	Internally assessed **Unit 4B:** P4 - Describe the impact that different human activities have on ecosystems. P5 - Describe how living and non-living indicators can be used to measure levels of pollutants. P6 - Describe the different methods used to help reduce the impact of human activities on ecosystems. M3 - Analyse the effects of pollutants on ecosystems. M4 - Discuss the advantages and disadvantages of methods used to reduce the impact of human activity on ecosystems. D2 - Explain the long-term effects of pollutants on living organisms and ecosystems. D3 - Evaluate the success of methods to reduce the impact of human activity on an ecosystem, for a given scenario. **Unit 2 and Unit 3** Completion of outstanding assessment tasks.

Personal Development/CEIAG	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…	**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** Discussing the impacts of human activities on wildlife, particularly the increase in the number of endangered and extinct animals. Researching ways to reduce the impact.
Reading & Writing	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.	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. Reading from a range of research materials about the uses of chemical products/ recording key facts as bullet points in a leaflet/ reading methods accurately/recording information in conclusions clearly using the correct scientific terminology and full sentences.	Researching nuclear disasters and highlighting key facts/writing in different styles (articles/reports etc.)/ recording information in tables clearly and neatly. Reading from a variety of resources to find key comparisons about ac and dc electricity/ writing comparisons in full sentences using punctuation and correct grammar to explain how the National Grid is inefficient/ reading written practical methods and writing reports analysing results.	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 from a range of research materials to highlight key facts about the causes of variation/ spelling key words correctly and writing in full sentences structured into paragraphs when comparing the causes of Evolution and Natural Selection.	Using the correct terminology when writing conclusions for results/ recording results in a suitable format/ reading research on the impacts of human activities on the environment and writing comparisons clearly spelling key words correctly.
Speaking & Listening	Speaking & Listening	Speaking & Listening	Speaking & 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 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 instructions during practical lessons / discussing practical results and evaluating methods.	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 short documentary clips about Evolution and Natural Selection and then sharing their ideas verbally with their peers/ verbally contributing ideas to given examples of different types of variation/ listening respectfully to the ideas of their peers.	Listening carefully to instructions during the practical lessons to analyse water samples/ joining in class discussions to compare results/ using the correct terminology when verbally explaining ideas.
Numeracy & Mathematical Reasoning	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.	Interpretation of secondary and primary data to provide evidence for opinions. Recording data accurately and using precise scales to accurately measure chemicals.	Interpreting data on radioactive decay to calculate half-life/ using the correct units when comparing radioactive properties. Using equations to calculate voltage, current and resistance/ rearranging equations/ calculating averages/ interpreting data from graphs to make comparisons.	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.	Using a timeline to record the stages of Evolution for a chosen species/ understanding how to interpret large numbers and represent in written form.	Using the correct scales to make accurate measurements/ recording results using the correct units/ forming accurate conclusions from sets of data/ using data to support key facts.
Creative Media	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 word/ power point to produce an article or presentation to compare key properties of chemicals. Using short clips to help students visualise how ionic and covalent bonds take place.	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 show how electricity is transmitted through the national grid/ using excel or word to record results and conclusions	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.	Watching short clips showing how Natural Selection and Evolution happen/ using the internet to research their own information and using power point or word to record their findings.	Using the internet to research key facts about the different types of pollution various human activities produce and how these impact on the environment.

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