KS4 Long Term Curriculum Plan: Year 9 2021-2022/GCSE Transition

Curriculum Aim: In Science we aim to prepare students for their GCSE exams whilst also allowing students to be able to understand and interpret the world that they live in. In year 9 we will begin by covering key stage 3 topics before beginning the GCSE combined science which prepares students to leave school with a strong understanding of how science works as well as preparing them for future careers, courses and employment in science.
Link to prior learning: This course will build on the knowledge and skills developed during study in Year 7 and 8, they will also develop their practical, problem solving and investigative skills.
Rationale of sequencing: The topics have been ordered in a way that allows them to build on the following topics skills.

	Focus / Topic	Knowledge & Skills (from NC/Programmes of Study)	Assessment
Autumn 1	KS3 P1 Electricity and magnetism KS3 P2 Energy	**P1** - Explain electric current, measured in amps, in series and parallel circuits. Explain potential difference, measured in volts, in series and parallel circuits. Describe and explain resistance, measured in ohms. Explain static electricity in terms of positive and negative charges. Use plotting compasses to identify a magnetic field around a magnet. Describe the magnetic effect of a current. **P2** -Compare energy values of different foods in kJ. Compare power ratings of appliances in kW. Compare amounts of energy transferred. Use ideas about energy to explain domestic fuel bills, fuel use and costs. Describe heating and thermal equilibrium in terms of conduction, convection and radiation. Skills: Make predictions using scientific knowledge and understanding. Interpret observations and data, identifying patterns and using observations to draw conclusions. Identify further questions arising from your results. Make and record observations and measurements using a range of methods. Use and derive simple equations and carry out appropriate calculations.	P1 Electricity and magnetism end of topic test P3 Energy end of topic test
Autumn 2	KS3 P3 Motion and pressure	**P3** - Describe speed and the quantitative relationship between average speed, distance and time. Explain the representation of a journey on a distance-time graph. Explain atmospheric pressure in terms of weight of air above. Explain pressure in gases and liquids. Describe pressure measured by ratio of force over area. Describe a moment as the turning effect of a force. Skills: Ask questions and develop a line of enquiry based on observations of the real world alongside prior knowledge and experience.	P3 Motion and pressure end of topic test B15, B16 End of topic test

	GCSE Transition Topics **B15** Adaptation, interdependence and competition **B16** Organising an ecosystem	**B15** To be able to understand how scientific methods and theories develop over time and to interpret evolutionary trees. **B16** To be able to record first-hand observations of organisms and extract and interpret information from charts, graphs and tables.	Required practicals: B15 Field Investigations
Spring 1	**B17** Biodiversity and ecosystems	**B17** To be able to interpret and explain the processes in diagrams of the carbon cycle, the water cycle and to explain how waste, deforestation and global warming have an impact on biodiversity. To be able to discuss and understand the conflict between the need for cheap available compost to increase food production and the need to conserve peat bogs and peatlands as habitats for biodiversity and to reduce carbon dioxide emissions.	B17 End of topic test
Spring 2	**C1** Atomic Structure	**C1** To know that all substances are made of atoms. An atom is the smallest part of an element that can exist and to safely use a range of equipment to separate chemical mixtures. To know how to represent the electronic structures of the first twenty elements of the periodic table in both forms.	C1 End of topic test
Summer 1	**C2** The periodic table **B1** Cell structure and transport	**C2** To know that the early periodic tables were incomplete and some elements were placed in inappropriate groups if the strict order of atomic weights was followed and to be able to explain how testing a prediction can support or refute a new scientific idea. **B1** To be able to recognise, draw and interpret images of cells and to be able to explain the importance of cell differentiation. To be able to use the prefixes centi, milli, micro and nano and to recognise, draw and interpret diagrams that model diffusion.	C2, B1 End of topic test Required practicals: B1 microscopy B1 Osmosis
Summer 2	**B2** Cell division **B3** Organisation and the digestive system	**B2** To know that cells divide in a series of stages called the cell cycle. To evaluate the practical risks and benefits, as well as social and ethical issues, of the use of stem cells in medical research and treatments. **B3** To develop an understanding of size and scale in relation to cells, tissues, organs and systems and to be able to use other models to explain enzyme action. To use investigative skills to complete food tests for sugar, starch, protein and lipids.	B2, B3 End of topic test Required practicals: B3 Enzymes B3 Food tests

Further Information

AQA Specification: https://www.aqa.org.uk/subjects/science/gcse/combined-science-trilogy-8464
Chace GCSE Science website: https://sites.google.com/chace.enfield.sch.uk/year11revision
Seneca: https://senecalearning.com/en-GB/
Kerboodle: https://www.kerboodle.com/users/login
BBC bitesize:https://www.bbc.co.uk/bitesize/examspecs/z8r997h