Department Curriculum Map

Department	Science

Skills required in Year 11

- **WS 1.1 Understand how scientific methods and theories develop over time.**
- **WS 2.1 Use scientific theories and explanations to develop hypotheses.**
- **WS 2.2 Plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena.**
- **WS 2.3 Apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment.**
- **WS 2.4 Carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations.**

Year	AUT1	AUT2	SPR1	SPR2	SUM1	SUM2	Secured
11 Skills Covered	**WS 2.2 Plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena.**	**WS 2.2 Plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena.**	**WS 1.1 Understand how scientific methods and theories develop over time.**	**WS 1.1 Understand how scientific methods and theories develop over time.** **WS 2.1 Use scientific theories and explanations to develop hypotheses.**			

	WS 2.3 Apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment. **WS 2.4 Carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations.**	**WS 2.3 Apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment.** **WS 2.4 Carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations.**					
Theme/ Focus/ Content	**<u>Organic chemistry</u>** • Alkanes and alkenes • Fractional distillation of crude oil • Cracking	**<u>Using resources</u>** • Earth's resources • Phytomining and bioleaching • Rusting	**<u>The earth's atmosphere</u>** • The earth's atmosphere • Climate change **<u>Magnets</u>** • Poles of magnets • Electromagnets **<u>Triple science: Space</u>**	**<u>Energy Changes</u>** • Exothermic reactions • Endothermic reactions • Bond energy	**<u>Waves</u>** • Transverse and longitudinal waves • Wave speed • Electromagnetic waves • The electromagnetic spectrum **<u>Ecology</u>**		

			• Life cycle of stars • The solar system • Red shift and the big bang		• Ecosystems • Nutrient cycles • Feeding relations • Biodiversity **Revision:** Targeted topic intervention for topics where students have performed poorly in the mocks.		
10 Skills Covered	**S 1.4 Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.** **WS 2.5 Recognise when to apply a knowledge of sampling techniques to ensure any samples collected are representative.**	**WS 1.2 Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts.** **WS 1.3 Appreciate the power and limitations of science and consider any ethical issues which may arise.**	**S 1.4 Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.** **WS 2.6 Make and record observations and measurements using a range of apparatus and methods.** **WS 2.7 Evaluate methods and suggest possible**	**WS 1.2 Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts.** **WS 1.3 Appreciate the power and limitations of science and consider any ethical issues which may arise.**	**WS 2.6 Make and record observations and measurements using a range of apparatus and methods.** **WS 2.7 Evaluate methods and suggest possible improvements and further investigations**	**S 1.4 Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.** **Evaluate risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences**	

			improvements and further investigations **WS 4.2 Recognise the importance of scientific quantities and understand how they are determined.** **WS 4.3 Use SI units (eg kg, g, mg; km, m, mm; kJ, J) and IUPAC chemical nomenclature unless inappropriate.** **WS 4.4 Use prefixes and powers of ten for orders of magnitude (eg tera, giga, mega, kilo, centi, milli, micro and nano).**				
Theme/ Focus/ Content	**Quantitative Chemistry** • Relative formula mass • Percentage mass • Moles **Bioenergetics:** • Respiration • Photosynthesis	**Atomic Structure :** • Structure of the atom • Alpha, beta and gamma radiation • Half – life Chemical Analysis: • Test for gases • Test for chlorine	**Waves** • Transverse and longitudinal waves • Wave speed • Electromagnetic waves • The electromagnetic spectrum	**Inheritance, variation and evolution** • Sexual and asexual reproduction • Genetic crosses • Genetic diseases • Evolution • Manipulating genes	**Forces:** • Newton's laws • Acceleration • Stopping distance **Homeostasis and Response** • The skin • The nervous system • Diabetes • The kidneys	**Homeostasis and Response** • The skin • The nervous system • Diabetes • The kidneys **Rate and Extent of chemical change** • Rates of reaction • Electrolysis • Catalysts • Surface area	

				• Classification		• Concentration • Temperature	
9 Skills Covered	**WS 1.1 Understand how scientific methods and theories develop over time.** **WS 1.3 Appreciate the power and limitations of science and consider any ethical issues which may arise.** **Evaluate risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences** **WS 4.5 Interconvert units.** **WS 4.6 Use an appropriate number of significant figures in calculation.**	**WS 1.1 Understand how scientific methods and theories develop over time.** **WS 1.2 Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts.**	**WS 1.3 Appreciate the power and limitations of science and consider any ethical issues which may arise.** **S 1.4 Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.**	**WS 1.1 Understand how scientific methods and theories develop over time.** **WS 1.2 Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts. Evaluate risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences**	**WS 1.3 Appreciate the power and limitations of science and consider any ethical issues which may arise.** **S 1.4 Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments. Evaluate risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences** **WS 2.6 Make and record observations and measurements using a range of**		

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Theme/ Focus/ Content	**Cell biology (required practicals first to build skills)** • Cells • Cell division • Diffusion • Osmosis • Active transport • **Atomic structure and the periodic table** • The periodic table • Elements , compounds and mixtures	• History of the atom • Groups 1, 7 and O • Electron configuration **Energy** • Types of Energy • Kinetic Energy • Energy transfers	**Bonding, structure and properties of substances** • States of matter • Ionic, covalent and metallic compounds **Infection and response** • Pathogens and disease • Viral, bacterial and protists • Immunity • Treating diseases • Developing new drugs	**Electricity** • Circuit symbols • Series circuits • Parallel circuits • Ohmic conductors • Non-ohmic conductors	**Chemical Changes** • Metals and acids • Metal carbonates and acids • Neutralisation • Chromatography	**Particle model of matter:** • Solids, liquids and gases • Specific heat capacity • Latent heat **Organisation** • Specialised cells • Digestion • Blood and circulation • Communicable and non-communicable diseases • Plant tissues	

8 Skills Covered	**Planning an investigation** **Making accurate observations** **Making measurements** **Recording data** **Presenting data** **Analysis** **Drawing conclusions** **Evaluation**	**Planning an investigation** **Making accurate observations** **Making measurements** **Recording data** **Presenting data** **Analysis** **Drawing conclusions** **Evaluation**	**Planning an investigation** **Making accurate observations** **Presenting data** **Analysis** **Drawing Conclusions** **Evaluation**	**Planning an investigation** **Making accurate observations** **Presenting data** **Analysis** **Drawing Conclusions** **Evaluation**	**Making accurate observations** **Presenting data** **Analysis** **Drawing conclusions** **Evaluations** **Research**	**Making accurate observations** **Presenting data** **Analysis** **Drawing conclusions** **Evaluations** **Research**	
Theme/ Focus/ Content	Introduction to Science Nutrition and diet	Electricity and Magnets Pure and Impure substances	Magnets	Photosynthesis and the environment	Energetics Respiration, Gas exchange and health	Earth and Rocks Periodic Table and Chemical Reactions	

7 Skills Covered	**Planning an investigation** **Making accurate observations** **Recording data** **Presenting data** **Analysis** **Drawing Conclusions** **Evaluation**	**Planning an investigation** **Making accurate observations** **Presenting data** **Analysis** **Drawing Conclusions** **Evaluation**	**Planning an investigation** **Making accurate observations** **Making measurements** **Presenting data** **Analysis** **Drawing conclusions** **Evaluation**	**Planning an investigation** **Making accurate observations** **Making measurements** **Presenting data** **Analysis** **Drawing conclusions** **Evaluation**	**Making accurate observations** **Presenting data** **Analysis** **Drawing conclusions** **Evaluations** **Research**	**Making accurate observations** **Presenting data** **Analysis** **Drawing conclusions** **Evaluations** **Research**	
Theme/ Focus/ Content	Introduction to science Cells	Particle nature of matter Forces	Nuts and Bolts Atoms and Elements	Waves Pure and Impure Substances	Space Nutrition and Digestion	Acids and Alkalis Light	