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.

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- 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	Secure
							d
11	WS 2.2 Plan	WS 2.2 Plan	WS 1.1 Understand	WS 1.1 Understand			
	experiments or devise	experiments or devise	how scientific methods	how scientific			
Skills	procedures to make	procedures to make	and theories develop	methods and			
Covere	observations, produce	observations, produce	over time.	theories develop			
d	or characterise a	or characterise a		over time.			
	substance, test	substance, test					
	hypotheses, check	hypotheses, check data		WS 2.1 Use			
	data or explore	or explore phenomena.		scientific theories			
	phenomena.			and explanations			
		WS 2.3 Apply a		to develop			
	WS 2.3 Apply a	knowledge of a range of		hypotheses.			
	knowledge of a range	techniques,					

	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.	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.	Mauga	Triple esignee.		
Theme / Focus/ Conte nt	Covid Curriculum Forces: Newton's laws Acceleration Stopping distance Magnets Poles of magnets Electromagnet	 <u>Chemical Analysis:</u> Test for gases Test for chlorine chromatography 	 Waves Transverse and longitudinal waves Wave speed Electromagnetic waves The electromagnetic spectrum 	 Triple science: Space Life cycle of stars The solar system Red shift and the big bang Bang 		

			 Organic chemistry Alkanes and alkenes Fractional distillation of crude oil Cracking 				
10	S 1.4 Explain everyday and technological	WS 1.2 Use a variety of models such as	S 1.4 Explain everyday and technological	WS 1.2 Use a variety of models	WS 2.6 Make and record observations and	S 1.4 Explain everyday and	
Skills	applications of science;	representational,	applications of science;	such as	measurements using a	technological	
Covere	evaluate associated	spatial, descriptive,	evaluate associated	representational,	range of apparatus and	applications of	
d	personal, social,	computational and	personal, social,	spatial, descriptive,	methods.	science; evaluate	
	economic and	mathematical to solve	economic and	computational and	WS 2.7 Evaluate	associated personal,	
	environmental	problems, make	environmental	mathematical to	methods and suggest	social, economic and	
	implications; and make	predictions and to	implications; and make	solve problems,	possible improvements	environmental	
	decisions based on the	develop scientific	decisions based on the	make predictions	and further	implications; and	
	evaluation of evidence	explanations and	evaluation of evidence	and to develop	investigations	make decisions	
	and arguments.	understanding of familiar and unfamiliar	and arguments.	scientific		based on the	
	WS 2.5 Recognise	facts.	WS 2.6 Make and	explanations and understanding of		evaluation of evidence and	
	when to apply a		record observations	familiar and		arguments.	
	knowledge of sampling	WS 1.3 Appreciate the	and measurements	unfamiliar facts.		Evaluate risks both	
	techniques to ensure	power and limitations	using a range of			in practical science	
	any samples collected	of science and consider	apparatus and	WS 1.3 Appreciate		and the wider	
	are representative.	any ethical issues which	methods.	the power and		societal context,	
		may arise.	WS 2.7 Evaluate	limitations of		including perception	

			methods and suggest possible 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).	science and consider any ethical issues which may arise.		of risk in relation to data and consequences
Theme / Focus/ Conte nt	 Particle model of matter: Solids, liquids and gases Specific heat capacity Latent heat 	Homeostasis and Response The skin The nervous system Diabetes The kidneys	Homeostasis and Response • The skin • The nervous system • Diabetes • The kidneys Atomic Structure and Radiation • Structure of the atom • Alpha, beta and gamma radiation	The earth's atmosphere • The earth's atmospher e • Climate change	 Ecology Ecosystems Nutrient cycles Feeding relations Biodiversity 	 <u>Using resources</u> Earth's resources Phytomining and bioleaching Rusting

	 Exothermic reactions Endothermic reactions Bond energy 		 Half – life Inheritance, variation and evolution Sexual and asexual reproduction Genetic crosses Genetic diseases Evolution Manipulating genes Classification Quantitative Chemistry Relative formula mass Percentage mass Moles 		 Rates of reaction Electrolysis Catalysts Surface area Concentration Temperature 	
9 V	WS 1.1 Understand	WS 1.1 Understand how	mass	WS 1.1 Understand	WS 1.3 Appreciate the	
	how scientific methods	scientific methods and	power and limitations	how scientific	power and limitations	

kills covere	and theories develop over time.	theories develop over time.				
		ume.	any ethical issues	theories develop	any ethical issues which	
			which may arise.	over time.	may arise.	
	WS 1.3 Appreciate the	WS 1.2 Use a variety of	•		-	
	power and limitations	models such as	S 1.4 Explain everyday	WS 1.2 Use a	S 1.4 Explain everyday	
	of science and	representational,	and technological	variety of models	and technological	
	consider any ethical	spatial, descriptive,	applications of science;	such as	applications of science;	
	issues which may	computational and	evaluate associated	representational,	evaluate associated	
	arise.	mathematical to solve	personal, social,	spatial, descriptive,	personal, social,	
		problems, make	economic and	computational and	economic and	
	Evaluate risks both in	predictions and to	environmental	mathematical to	environmental	
	practical science and	develop scientific	implications; and make	solve problems,	implications; and make	
	the wider societal	explanations and	decisions based on the	make predictions	decisions based on the	
		U		-		
	• •		and arguments.		•	
		facts.		•		
	consequences			•	•	
	units.				• •	
				•		
					consequences	
	•			•		
	calculation.					
	WC 4.2 December the					
	-			and consequences	•	
	•				methods.	
	-				WS 2 7 Evaluate	
	they are determined.					
	WS 4.3 Use SI units (eg				•	
					-	
					•	
					•	
	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 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.	explanations and understanding of familiar and unfamiliar facts.	decisions based on the evaluation of evidence and arguments.	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	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 apparatus and methods. WS 2.7 Evaluate methods and suggest possible improvements and further investigations WS 2.2 Plan experiments or devise procedures to make observations, produce	

	WS 4.4 Use prefixes and powers of ten for orders of magnitude (eg tera, giga, mega, kilo, centi, milli, micro and nano).				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.		
Theme / Focus/ Conte nt	Cell biology Cells Cell division Diffusion Osmosis Active transport 	 Energy Types of Energy Kinetic Energy Energy transfers 	 Organisation Communicable and non- communicable diseases Plant tissues 	Electricity Ohmic conductors Non-ohmic conductors 	 <u>Chemical Changes</u> Metals and acids Metal carbonates and acids Neutralisation Chromatography <u>Bioenergetics:</u> 	Bioenergetics: Photosynthesis	

 The periodic table Communicable and non-communicable diseases Elements, compounds and mixtures History of the atom Flectron configuration Electron Electron Circuit symbols Series circuits Non-ohmic conductors Non-ohmic 	 table Elements , compounds and mixtures History of the atom Groups 1, 7 and O Electron 	 Communicable and non- communicable diseases 	 States of matter Ionic, covalent and metallic compounds Electricity Circuit symbols Series circuits Parallel circuits Ohmic conductors Non-ohmic 	 and disease Viral, bacterial and protists Immunity Treating diseases Developing 	• Respiration	Revision	
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8 Skills	Planning an investigation	Planning an investigation	Planning an investigation	Planning an investigation	Making accurate observations	Making accurate observations	
Covere d	Making accurate observations	Making accurate observations	Making accurate observations	Making accurate observations	Presenting data	Presenting data	
	Making measurements	Making measurements	Presenting data	Presenting data	Analysis Drawing conclusions	Analysis Drawing conclusions	
	Recording data Presenting data	Recording data Presenting data	Analysis Drawing Conclusions	Analysis Drawing	Evaluations	Evaluations	
	Analysis	Analysis	Evaluation	Conclusions	Research	Research	
	Drawing conclusions	Drawing conclusions		Evaluation			
	Evaluation	Evaluation					
Theme / Focus/ Conte nt	Introduction to Science - Variables - Graphs (scaling, plotting, lines of best fit, anomalous results)	Photosynthesis Environment	Periodic table Chemical Reactions	Energetics Earth and Rocks STEM WEEK	Earth's atmosphere Respiration and health	Gas exchange Revision Crest Awards - Bronze	
	Electricity						

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7	Planning an	Planning an	Planning an	Planning an	Making accurate	Making accurate	
	investigation	investigation	investigation	investigation	observations	observations	
Skills							
Covere	Making accurate	Making accurate	Making accurate	Making accurate	Presenting data	Presenting data	
d	observations	observations	observations	observations			
					Analysis	Analysis	
	Recording data	Presenting data	Making measurements	Making			
	-	-		measurements	Drawing conclusions	Drawing conclusions	
	Presenting data	Analysis	Presenting data		5		
		· · · · · · · · · · · · · · · · · · ·		Presenting data	Evaluations	Evaluations	
	Analysis	Drawing Conclusions	Analysis				
	-11019515	Drawing conclusions	Analysis	Analysis	Research	Research	
	Drawing Conclusions	Evaluation	Drawing conclusions	Anarysis	Research	Research	
	Drawing conclusions	Evaluation	Drawing conclusions	Drawing			
	Evaluation		Evaluation	conclusions			
	Evaluation		Evaluation	conclusions			
		-		Evaluation			
	Introduction to science	States of matter	Light	Pure and impure	Forces	Magnets	
Theme	- Lab rules			substances			
/	- Safety	Atoms and elements	Waves		Space	Revision for end of	
Focus/	equipment			Acids and alkalis		year test	
Conte	- Measurements		Nutrition and diet				
nt	 Recording and 			STEM WEEK		Crest Awards -	
	presenting					Bronze	
	- Basic bar charts						
	and line graphs						
	5 1						
	Cells						
	Nuts and bolts						