

NCEA Level 1 Science

Course Outline 2021



The 2021 course is based on the Science in New Zealand Curriculum Document and is structured around 6 units of work. Three of these units will be internally assessed and the remaining three will be assessed externally at the end of the year.

We will be using the Year 11 sciPAD Science micro-workbooks.

Investigate selected chemical reactions – selected from:

- Combination reactions. These are limited to simple reactions of elements with other elements (such as magnesium or sulfur with oxygen, iron with sulfur etc.).
- Exchange reactions. These are limited to precipitation reactions e.g. formation of:
 - chlorides of silver and lead
 - sulfates of barium and lead
 - hydroxides of copper, iron (II), calcium, and magnesium
 - carbonates of copper, iron (II), zinc, calcium, and magnesium.
- Decomposition reactions - limited to thermal decomposition of carbonates and hydrogen carbonates.
- Displacement reactions - limited to the displacement of metal ions in solution by other metals.

INTERNAL

Carry out a practical physics investigation that leads to a linear mathematical relationship with direction.

This assessment requires you to conduct an experiment, and draw a conclusion from it

- * You will perform a practical experiment using electrical circuits in groups and independently analyse your results
- * You will then process this information, plot a graph and draw a conclusion from this graph.
- * You will need to link your prior knowledge, in order to draw your conclusion

INTERNAL

Investigate biological ideas relating to interactions between humans and micro-organisms.

The context for this assessment is a report relating the structure and life-processes of micro-organisms to the conditions for healthy microbial growth.

- You will perform a practical experiment in groups and independently research the life-processes and conditions of microbes.
- You will then process this information, form a conclusion and present a report.
- You will need to link your prior knowledge, the information gathered on microbes, biological ideas relating to the interactions between humans and microbes.
- This assessment is based on the use of microbes in food production.

Demonstrate an understanding of aspects of carbon chemistry.

- Structure and names of carbon compounds using systematic nomenclature. Writing structural formulae, and explaining the relevance of the covalent bonding between atoms.
- Properties of carbon compounds, related to their solubility in water and trends in melting and/or boiling points.
- Compare and contrast complete and incomplete combustion reactions and discussing the effects of combustion products on human health and the environment.
- Describe polymerisation reactions of ethene and propene.
- Production usable components from crude oil describing the fractional distillation of crude oil and cracking of fractions. Compare and contrast fermentation to produce alcohol to the production of methanol from natural gas.
- State the uses and importance of fuels and polymers from ethene and propene.

Demonstrate understanding of electricity and magnetism.

- * Static Electricity: positive and negative charge, conductors and insulators, uniform and non-uniform charge distributions, earthing, electrical discharge in air, separation of charge by friction, charging by contact.
- * DC Electricity: voltage, current, resistance, power, series circuits and simple parallel circuits, circuit diagrams, the relationships
 $V = IR$, $P = IV$, $P = \frac{E}{t}$, $R_T = R_1 + R_2 + \dots$
- * Magnetism: magnetic field directions, interactions and the result of interactions (including magnetic field of bar magnets, the earth's magnetic field, magnetic fields due to currents in straight wires and solenoids), right-hand grip rule, electromagnets, the relationship $B = \frac{\mu_0 I}{d}$.

Demonstrate understanding of biological ideas relating to genetic variation

- the roles of DNA in both carrying instructions to the next generation and determining genotype and the resultant phenotype
- the relationship between DNA, alleles, genes, and chromosomes
- how chromosome pairs mean that individuals inherit two copies of each gene.
- how mutations form new 'alleles' - alternative versions of genes
- how meiosis generates gametes and the significance of sexual reproduction (in producing a new mix of alleles)
- patterns of inheritance involving simple monohybrid inheritance showing complete dominance, sex determination, possible genotypes, and phenotype ratios.
- Inheritable/non-inheritable variations that exist within a group of living organisms
- differing rates of survival by various members of a group may depend on their phenotype
- the importance of variation within populations (population and species survival) in a changing environment such as pest infestation, disease, drought, or flood
- the advantages and disadvantages of sexual reproduction.

The course offered is NCEA Level 1 Science. HIBS is offering the following mix of internal and external achievement standards, to give a total of 24 credits.

Unit	Standard	Description	INT/EXT	Credits
Physics 1.3	A.S. 90937	Demonstrate understanding of electricity and magnetism.	External	4
Chemistry 1.3	A.S. 90932	Demonstrate an understanding of aspects of carbon chemistry	External	4
Science 1.9	A.S. 90948	Demonstrate understanding of biological ideas relating to genetic variation	External	4
Science 1.8	A.S. 90947	Investigate selected chemical reactions	Internal	4
Physics 1.1	A.S. 90935	Carry out a practical physics investigation that leads to a linear mathematical relationship with direction.	Internal	4
Science 1.11	A.S. 90950	Investigate biological ideas relating to interactions between humans and micro-organisms	Internal	4

Year 11 Timeline

The following units will have a (non-credit), end of unit assessment which will take place at the conclusion of each unit of work, and an external end of year examination.

Unit	Provisional date
Physics 1.3 Electricity and Magnetism	March 19
Science 1.9 Genetics	July 8
Chemistry 1.3 Carbon Chemistry	September 30

The internal component of the subject will be assessed as follows:

Unit	Assessment	Provisional date
Phys 1.1 Investigate implications of electricity and magnetism for everyday life.	Practical investigation written report	Term 1 wk. 8 to 11
Science 1.11 Investigate biological ideas relating to interactions between humans and micro-organisms	Practical investigation written report	Term 2 wk.1 to 4
Science 1.8 Investigate selected chemical reactions	Practical investigation report	Term 3 wk. 1 to wk.4

2021 Specialised Science Course

W	Month	Date	Topic	Assessment	Assessment
1	February	1-5	Physics 1.3 Electricity and magnetism		
2	February	9-12			Waitangi Day 6 th and 8 th
3	February	15-19			
4	February	22-26			
5	March	1-5			
6	March	9-12			
7	March	15-19			Unit test
8	March	22-26	Physics 1.1 Physics investigation that leads to a linear mathematical relationship		
9	March/April	29-1			Good Friday 2nd April
10	April	7-9		Formative	Easter Monday and Tuesday 5 th and 6 th
11	April	12-16	Summative	Thursday 15 th April	
	April	19-23			
	April	26-30			Anzac Day Holiday 27 th
1	May	3-7	Science 1.11 Investigate biological ideas relating to interactions between humans and micro-organisms		
2	May	10-14			
3	May	17-21			ToD 11 th May
4	May	24-28			
5	May/June	31-4	Science 1.9 Genetics		
6	June	8-11			Queen's B' Day 7 th June
7	June	14-18			
8	June	21-25			
9	July	28-2			
10	July	5-9			Unit test July
	July	12-16			
	July	19-23			
1	July	26-30	Science 1.8 Investigate selected chemical reactions		
2	August	2-6			
3	August	9-23			ToD 5 th August
4	August	16-20			
5	August	23-27	Chemistry 1.3 Carbon Chemistry		
6	August/September	30-3			
7	September	6-11			Tournament week
8	September	13-17			
9	September	20-24			
10	September/October	27-1			Unit test September
	October	4-8			
	October	11-15			
1	October	18-22	HIBS Internal Evidence Exams		
2	October	26-29			Labour Day 25 th
3	November	1-5			Seniors last day Nov 3
4	November	8-12			
5	November	15-19			
6	November	22-26			
7	November/December	29-3			ToD 1 st December
8	December	6-10			