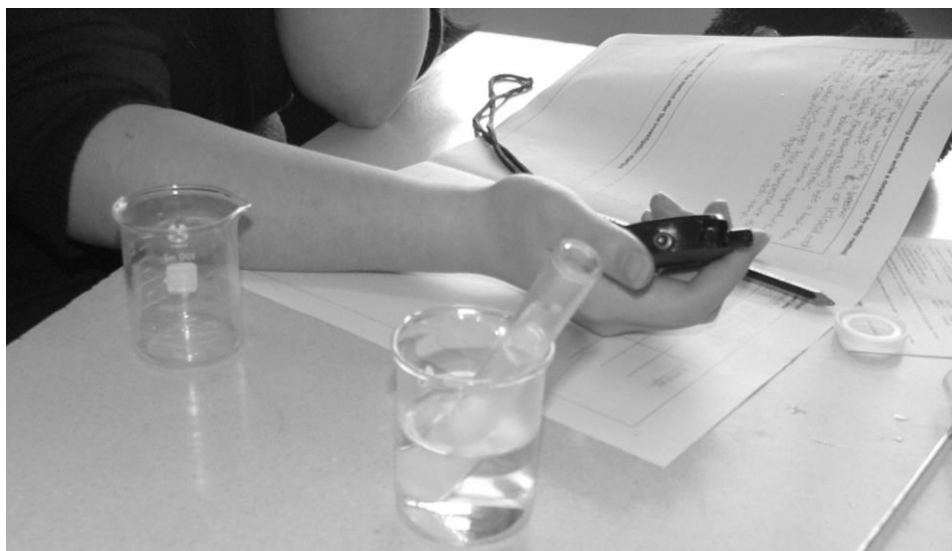


Year 11 SCIENCE (Level 1) 2016 Student Information



Science 101 Course Outline

Aims:

This course focuses on you understanding and investigating the living, physical, material and technological components of your environment. You will be provided with opportunities to develop scientific investigation skills to extend and develop your existing ideas about science.

Learning in science is fundamental to understanding the world in which you live. It helps people clarify ideas, to ask questions, to test explanations through measurement and observation, and to use their findings to establish the worth of an idea.

Science is a major influence in many aspects of your daily life, at work, at play and at home and the Level 1 course focuses on activities and ideas that are relevant to you.

To continue on with the specialist Sciences at Level 2 (Physics, Biology, Chemistry) you need to have at least 14 credits at level 1 Science, including the credits for the external in the subject you are looking to take at level 2. (I.e. to do Biology 201 you need to pass the Biology external (AS 90948) at level 1)

To continue on with Science 202 next year you need to have 10 credits from Science 101. Unlike the specialist Sciences, Science 202 does not lead to a Level 3 course.

Science 101 Course Assessment

The Science 101 Course contributes 24 credits towards the Level 1 National Certificate in Educational Achievement (NCEA) from the Science domain and is covered in 4 **major** topics of work. Topics 3 and 4 will be broken up into smaller sections for ease of learning. There are three internal and three external standards.

- Topic 1: Understanding the effects of astronomical cycles on planet Earth (Sci. 1.15) 90954
- Topic 2: Demonstrate understanding of genetic variation (Sci. 1.9) 90948
- Topic 3: Describe understanding of Acids and Bases (Sci. 1.5) 90944
Practical Chemistry investigation (Chem. 1.1) 90930
- Topic 4: Describe understanding of Mechanics (Sci. 1.1) 90940
Practical Physics investigation (Phys. 1.1) 90935

The **three external Achievement Standards** will be assessed in a 3-hour examination at the end of the year.

You can gain the following grades in the Achievement Standards.

Not Achieved	N	Did not meet the standard
Achieved	A	The standard was met (Shows ability to describe scientific ideas.)
Merit	M	The standard was met (Shows ability to describe and explain scientific ideas.)
Excellence	E	The standard was met (Shows ability to describe, explain and discuss scientific ideas.)

Standards that contribute to Level 1 Literacy and Numeracy

The Science 1.15 (Astronomical Cycles) standard contributes 4 credits to Level 1 Literacy. The Science 1.1 (Mechanics), Physics 1.1 (Physics practical) and Chemistry 1.1 (Chemistry practical) each contribute 4 credits towards Level 1 Numeracy.

Further assessment Opportunities

- AS 90954** NO further assessment opportunity will be made available.
- AS 90930** NO further assessment opportunity will be made available.
- AS 90935** NO further assessment opportunity will be made available.

However, there will be one **resubmission** opportunity for each internal Achievement Standard.

Class Tests and the School Exam

While the class tests and the school exam are not worth credits they are important. If a student misses the end of year exam and qualifies for a derived grade then their mark is taken **solely** from these practice assessments.

Refer to the Kāpiti College NCEA Policy and Procedures handbook for assessment procedures, including authenticity requirements, missed assessments and appeals.

KAPITI COLLEGE ASSESSMENT STATEMENT 2016

Subject:

Science 101

One week before each assessment you will be told
 * what learning outcomes will be assessed
 * how they will be assessed
 * how the assessment contributes towards your report.

Student to enter Achieved (A), Merit (M), Excellence (E) or Not Achieved (N)



Term	Week	Date	ASSESSMENT TASK	Int/Ext	Credits	NA, A, M, E
1	1	1-Feb-2016				
	2	9-Feb-2016				
	3	15-Feb-2016				
	4	22-Feb-2016				
	5	29-Feb-2016	Understanding astronomical cycles (AS90954)	Internal	4 (Lit.)	
	6	7-Mar-2016				
	7	14-Mar-2016				
	8	21-Mar-2016				
	9	29-Mar-2016				
	10	4-Apr-2016	Understanding of Genetic Variation – class test (AS 90948)	Ext	4	
	11	11-Apr-2016				
2	1	2-May-2016				
	2	9-May-2016				
	3	16-May-2016				
	4	23-May-2016				
	5	30-May-2016	Understanding of Acids and Bases class test (AS 90944)	Ext	4	
	6	7-Jun-2016				
	7	13-Jun-2016				
	8	20-Jun-2016				
	9	27-Jun-2016	Carry out a Practical Chemistry Investigation (AS 90930)	Internal	4 (num.)	
	10	4-Jul-2016				
3	1	25-Jul-2016				
	2	1-Aug-2016				
	3	8-Aug-2016				
	4	15-Aug-2016	School Exams: Two externals covered (AS 90948 and 90944)			
	5	23-Aug-2016				
	6	29-Aug-2016	Tournament week			
	7	5-Sep-2016				
	8	12-Sep-2016				
	9	19-Sep-2016	Carry out a Practical Physics Investigation (AS 90935)	Internal	4 (num.)	
4	1	10-Oct-2016				
	2	17-Oct-2016	Understanding of Mechanics class test (AS 90940)	Ext	4	
	3	25-Oct-2016	Revision			
	4	31-Oct-2016	Revision – School ends on Thursday			

Every effort will be made to keep to the schedule on the previous page. However, due to the dynamic nature of teaching and learning, assessment dates may change slightly. You will be informed of any changes well in advance.

Science Achievement Standards - 2016

Conditions of Assessment and other resources related to any of the internal achievement standards can be found at <http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards>.

Assessment Specifications and other resources related to any of the external achievement standards can be accessed through the Science Resources page found at www.nzqa.govt.nz/ncea/resources.

Following is an outline of what is required in each of the available Achievement Standards.

Subject Reference		Science 1.15			
Title		Understanding the effects of astronomical cycles on planet Earth			
Number		AS 90954		Version 3	
Level	1	Credits	4	Assessment	Internal
Assessment Type		Report	Further assessment		No

This achievement standard involves demonstrating understanding of the effects of astronomical cycles on planet Earth.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Demonstrate understanding of the effects of astronomical cycles on planet Earth. 	<ul style="list-style-type: none"> Demonstrate in-depth understanding of the effects of astronomical cycles on planet Earth. 	<ul style="list-style-type: none"> Demonstrate comprehensive understanding of the effects of astronomical cycles on planet Earth.

Explanatory Notes

- Demonstrate understanding* involves describing astronomical cycles and the effects on planet Earth using information, visual representations, and data.
- Demonstrate in-depth understanding* involves explaining astronomical cycles and the effects on planet Earth using information, visual representations, and data.
- Demonstrate comprehensive understanding* involves explaining thoroughly links between astronomical cycles and the effects on planet Earth using information, visual representations, and data. It may involve elaborating, applying, justifying, relating, evaluating, comparing and contrasting, or analysing.

- 4 *Astronomical cycles* are:
- Spin of the Earth
 - Orbit of Earth around Sun
 - Orbit of Moon around Earth
 - Effect of the Earth's tilt and the heating effect of the Sun.

- 5 *Effects on planet Earth* may be selected from:
- Day and night
 - Seasons
 - Changes of temperature during the day and night
 - Seasonal changes at the North and South poles, latitude of New Zealand, Tropics of Cancer and Capricorn, and the Equator
 - Formation and direction of winds in the Southern hemisphere - direction of surface ocean current flows in the Pacific Ocean
 - Phases of the Moon
 - Formation of tides
 - Neap and Spring tides.



Subject Reference		Science 1.9			
Title		Describe understanding of biological ideas relating to genetic variation			
Number		AS90948		Version 3	
Level	1	Credits	4	Assessment	External
Assessment Type		NZQA Exam	Further assessment		No

This achievement standard involves demonstrating understanding of biological ideas relating to genetic variation.

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> • Demonstrate understanding of biological ideas relating to genetic variation. 	<ul style="list-style-type: none"> • Demonstrate in-depth understanding of biological ideas relating to genetic variation. 	<ul style="list-style-type: none"> • Demonstrate comprehensive understanding of biological ideas relating to genetic variation.

Explanatory Notes

- 1 *Demonstrate understanding* involves recognising, naming, drawing, and giving characteristics of, or an account of, genetic variation.
- 2 *Demonstrate in-depth understanding* involves explaining how or why genetic variation occurs.
- 3 *Demonstrate comprehensive understanding* involves linking biological ideas about genetic variation. It may involve explaining, elaborating, applying, justifying, relating, evaluating, comparing and contrasting, or analysing.

- 4 *Biological ideas relating to genetic variation* are limited to concepts and processes connected with:
- the continuity of life based on the inheritable nature of DNA
 - links between DNA and variation in phenotypes
 - variation in phenotypes as adaptive features.
- 5 Biological concepts and processes relating to the inheritable nature of DNA will be selected from:
- the roles of DNA in both carrying instructions to the next generation and determining phenotype
 - the relationship between DNA, alleles, genes, and chromosomes
 - the way in which genotype determines phenotype
 - the way chromosomes exist as pairs so that individuals inherit two copies of each gene.
- 6 Biological concepts and processes relating to variation in phenotype will be selected from:
- the significance of an allele as an alternative version of a gene
 - the role of mutations in forming new alleles
 - the role of meiosis in generating gametes (students are not required to provide the names of the stages of meiosis)
 - the significance of sexual reproduction (in producing a new mix of alleles)
 - the patterns of inheritance involving simple monohybrid inheritance showing complete dominance, sex determination, possible genotypes, and phenotype ratios.
- 7 Biological concepts and processes relating to variation in phenotypes as adaptive features will be selected from:
- inheritable and 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.
- 8 The student must be familiar with the following genetic language and conventions: gene, allele, mutation, genotype, phenotype, gamete, zygote, dominant, recessive, homozygous, heterozygous, pure breeding, Punnett square, and pedigree chart.

Subject Reference		Science 1.4			
Title		Describe understanding of aspects of acids and bases			
Number		AS90944		Version 4	
Level	1	Credits	4	Assessment	External
Assessment Type		NZQA Exam	Further assessment		No

This achievement standard involves demonstrating understanding of atomic structure, particle theory and rates of reaction relating to acids and base properties, uses and reactions.

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> • Demonstrate understanding of aspects of acids and bases. 	<ul style="list-style-type: none"> • Demonstrate in-depth understanding of aspects of acids and bases. 	<ul style="list-style-type: none"> • Demonstrate comprehensive understanding of aspects of acids and bases.

Explanatory Notes

- 1 *Demonstrate understanding* typically involves describing, identifying, naming, drawing, or giving an account of aspects of acids and bases. This may require the use of chemistry vocabulary, symbols and conventions (including names and formulae), and completing word equations.
- 2 *Demonstrate in-depth understanding* typically involves explaining aspects of acids and bases. This may require explanations that use chemistry vocabulary, symbols and conventions (including names and formulae) and writing word equations or completing given symbol equations.
- 3 *Demonstrate comprehensive understanding* typically involves linking aspects of acids and bases. It may involve explaining, elaborating, justifying, relating, evaluating, comparing and contrasting, or analysing. This may require the use of chemistry vocabulary, symbols and conventions (including names and formulae), and writing balanced symbol equations.
- 4 *Aspects of acids and bases* will be selected from:
 - Atomic structure
 - electron arrangement of atoms and monatomic ions of the first 20 elements (a periodic table will be provided)
 - ionic bonding
 - names and formulae of ionic compounds using a given table of ions.
 - Properties
 - acids release hydrogen ions in water
 - reactions (of acids with bases) to form salts
 - pH and effects on indicators.
 - Rates of reaction and particle theory.
 - Uses
 - neutralisation
 - carbon dioxide formation
 - salt formation.
- 5 *Acids and bases* are restricted to HCl, H₂SO₄, HNO₃, metal oxides, hydroxides, carbonates and hydrogen carbonates. Other acids may be included in examination questions. The names and formulae of any such acids will be given in the question.

Subject Reference		Chemistry 1.1			
Title		Carry out a practical chemistry investigation, with direction			
Number		AS90930		Version 3	
Level	1	Credits	4	Assessment	Internal
Assessment Type		Practical	Further assessment		No

This achievement standard involves carrying out a procedure to collect and process primary data and interpret the results, with direction.



Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none">Carry out a practical chemistry investigation, with direction.	<ul style="list-style-type: none">Carry out an in-depth practical chemistry investigation, with direction.	<ul style="list-style-type: none">Carry out a comprehensive practical chemistry investigation, with direction.

Explanatory Notes

- With direction* means that general instructions for the investigation will be specified in writing and direction will be given in the form of a purpose, an outline of the method, and the equipment and/or chemicals from which to choose. A template or suitable format for planning the investigation will be provided for the student to use.
- A *practical chemistry investigation* includes collecting, processing, and interpreting primary data to reach a conclusion in a chemistry context using chemistry vocabulary, symbols, conventions and equations as appropriate. Suitable contexts could include: acid-metal reactions, acids and bases, rates of reaction, energy output of fuels, fermentation.
- Carry out a practical chemistry investigation* involves:
 - developing a method for collecting primary data with units, relevant to the purpose, based on the manipulation of the independent variable over a range of values
 - processing and representing the data in an appropriate way (graph, table, calculation etc)
 - writing a conclusion based on the processed data.
- Carry out an in-depth practical chemistry investigation* involves:
 - developing a procedure for collecting primary data, with units, relevant to the purpose, based on the manipulation of the independent variable over a valid range of values with repetition to show reliability
 - controlling the variable(s) that could have a significant effect on the results
 - using techniques to increase the accuracy of the measured values of the dependent (and independent) variable
 - processing and representing the data to enable a conclusion to be reached
 - writing a conclusion based on the processed data that links to the purpose of the investigation.
- Carry out a comprehensive practical chemistry investigation* involves an in-depth investigation that also:
 - justifies the choices made to increase accuracy during the investigation
 - justifies the conclusion in terms of the processed data and the purpose of the investigation
 - relates investigation findings to applicable chemistry ideas.

Subject Reference		Science 1.1			
Title		Describe understanding of aspects of mechanics			
Number		AS90940		Version 3	
Level	1	Credits	4	Assessment	External
Assessment Type		NZQA Exam	Further assessment		No

This achievement standard involves demonstrating understanding of aspects of mechanics and may include using methods when solving related problems.



Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Demonstrate understanding of aspects of mechanics. 	<ul style="list-style-type: none"> Demonstrate in-depth understanding of aspects of mechanics. 	<ul style="list-style-type: none"> Demonstrate comprehensive understanding of aspects of mechanics.

Explanatory Notes

- Demonstrate understanding of aspects of mechanics* typically involves providing evidence that shows awareness of how simple facets of phenomena, concepts or principles relate to given situations. This may include using methods for solving problems involving aspects of mechanics.
- Demonstrate in-depth understanding of aspects of mechanics* typically involves providing evidence that shows how or why phenomena, concepts or principles relate to given situations.
- Demonstrate comprehensive understanding of aspects of mechanics* typically involves providing evidence that shows how or why phenomena, concepts and principles are connected in the context of given situations. Statements must demonstrate understanding of connections between concepts.
- Evidence may be written, mathematical, graphical or diagrammatic.
- Aspects of mechanics will be limited to a selection from the following:
 - Distance, speed, interpretation of distance and speed time graphs, average acceleration and deceleration in the context of everyday experiences such as journeys, sport, getting going. The relationships $v = \frac{\Delta d}{\Delta t}$ $a = \frac{\Delta v}{\Delta t}$.
 - Mass, weight and the acceleration due to gravity, balanced and unbalanced forces, in the context of everyday experiences such as being stationary, moving at constant speed, accelerating. The relationship $F_{\text{net}} = ma$.
 - Force and pressure in the context of everyday experiences. The relationship $P = \frac{F}{A}$.
 - Work and power, gravitational potential energy, kinetic energy, and the conservation of mechanical energy in free fall situations in the context of everyday experiences such as sports performance, dropping things, tossing balls. The relationships $\Delta E_P = mg\Delta h$ $E_K = \frac{1}{2}mv^2$ $W = Fd$ $P = \frac{W}{t}$.



Subject Reference		Physics 1.1			
Title		Carry out a practical physics investigation that leads to a linear mathematical relationship, with direction			
Number		AS90935		Version 3	
Level	1	Credits	4	Assessment	Internal
Assessment Type		Practical	Further assessment		No

This achievement standard involves carrying out a practical physics investigation that requires the graphical representation and mathematical description of a linear relationship, with direction.

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Carry out a practical physics investigation, with direction, that leads to a linear mathematical relationship. 	<ul style="list-style-type: none"> Carry out an in-depth practical physics investigation, with direction, that leads to a linear mathematical relationship. 	<ul style="list-style-type: none"> Carry out a comprehensive practical physics investigation, with direction, that leads to a linear mathematical relationship.

Explanatory Notes

- With direction* means that general instructions for the investigation will be specified in writing and direction will be given in the form of a purpose, an outline of the method, and the equipment and/or materials from which to choose. A template or suitable format for planning the investigation will be provided for the student to use.
- A *practical investigation* is an activity that includes collecting, processing and interpreting data. The investigation must lead to a linear mathematical relationship.
- Carry out a practical physics investigation* involves:
 - developing a method for collecting the data
 - collecting primary data, with units, relevant to the purpose, based on the manipulation of the independent variable over a reasonable range and number of values
 - drawing a graph, based on the data
 - writing a conclusion that links the processed data to the identified trend on the graph.
- Carry out an in-depth practical physics investigation* involves:
 - controlling the variable(s) that could have a significant effect on the results
 - using technique(s) that increase the accuracy of the measured values of the dependent (and independent, if appropriate) variable
 - drawing a linear graph, valid for the data
 - writing a conclusion that states the equation of the relationship.
- Carry out a comprehensive practical physics investigation* involves writing a discussion that validates the conclusion. The discussion may include as appropriate:
 - a justification for the accuracy-improving techniques used
 - a reason that there is a limit to either end of the value chosen for the independent variable
 - a justification why a variable needs to be controlled.
 - a description of any difficulties encountered when making measurements and how these difficulties were overcome
 - a link between investigation findings and applicable physics ideas
 - a description of any unexpected outcomes of the processing of the results and a suggestion of how these outcomes could have been caused and/or the effect they had on the validity of the conclusion.

Your record of Results.

This is an important record for you to keep as results sometimes get entered incorrectly in NZQA files and this will help you check whether your results have been entered incorrectly. You should check this record with your school reports.

Internals

Number	Standard Title	No. of Credits	Grade Achieved	Parent/Guardian signature
AS 90954	Understanding the effects of astronomical cycles on planet Earth	4		
AS 90930	Carry out a practical Chemistry investigation	4		
AS90935	Carry out a practical Physics investigation	4		

Externals

Number	Achievement Standard	No. of Credits		Grade Achieved	Parent/Guardian signature
AS90948	Describe understanding of biological ideas relating to genetic variation	4	Class Test:		
			Exam:		
AS90944	Describe understanding of aspects of acids and bases	4	Class Test:		
			Exam:		
AS90940	Describe understanding of aspects of mechanics	4	Class Test:		