

# Year 11 Science (Level 1)

## Science 102

### Course information



# 2016

The Science 102 Course contributes 24 credits towards the Level 1 National Certificate in Educational Achievement (NCEA) and is covered in 9 units of work.

### **Standards that contribute to Level 1 Numeracy**

The Science 1.2 (Electricity and Magnetism) and Physics 1.1 (Physics practical) each contribute 4 credits towards Level 1 Numeracy.

To continue on with Science 202 next year you need to have 16 credits from Science 102. However, Science 202 does not lead to any Level 3 Science course.

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

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

**KAPITI COLLEGE ASSESSMENT STATEMENT 2016**

**Subject:**

# Science 102

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	Body Maintenance US 18969 V5	int	2	
	6	7-Mar-2016				
	7	14-Mar-2016				
	8	21-Mar-2016				
	9	29-Mar-2016	Matter US 18973 V6	int	2	
	10	4-Apr-2016				
	11	11-Apr-2016	Chemical Reactions US 18974 V5	int	2	
2	1	2-May-2016				
	2	9-May-2016				
	3	16-May-2016				
	4	23-May-2016				
	5	30-May-2016				
	6	7-Jun-2016	Investigate metals & their uses AS 90946 V3	int	4	
	7	13-Jun-2016				
	8	20-Jun-2016				
	9	27-Jun-2016	Earth in Space US 18989 V6	int	2	
	10	4-Jul-2016				
3	1	25-Jul-2016				
	2	1-Aug-2016	Simple Practical US 21611 V5	int	2	
	3	8-Aug-2016				
	4	15-Aug-2016	<b>Senior exams:</b> Physics Practical AS 90935 V3	int	4	
	5	23-Aug-2016				
	6	29-Aug-2016	<b>Tournament week</b>			
	7	5-Sep-2016				
	8	12-Sep-2016				
	9	19-Sep-2016	Electricity and Magnetism AS 90941 V3	int	4	
4	1	10-Oct-2016				
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	3	25-Oct-2016	Earth Science US 18982 V6	int	2	
	4	31-Oct-2016	<b>Seniors finish</b>			

## Science Standards Outline – 2016

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

<b>Subject Reference</b>		<b>Body Maintenance</b>			
<b>Title</b>		<b>Demonstrate knowledge of the characteristics of living things, organs, and an organ system</b>			
<b>Number</b>		<b>US 18969</b>		<b>Version 5</b>	
<b>Level</b>	<b>1</b>	<b>Credits</b>	<b>2</b>	<b>Assessment</b>	<b>Internal</b>
<b>Assessment Type</b>		<b>Class test</b>	<b>Further assessment</b>		<b>Yes</b>

### Outcomes and evidence requirements

#### Outcome 1

Describe characteristics of living things.

1.1 The description identifies life processes carried out by living things.

Range life processes include – growth, respiration, feeding, reproduction, sensitivity, movement, excretion; evidence of four life processes is required.

1.2 The description identifies units of living things.

Range units of living things include – cells, tissues, organs, organ systems, organisms; evidence of three units of living things is required.



#### Outcome 2

Describe the function of organs.

Range organs include – brain, heart, lungs, stomach, intestines, kidneys, liver, skin; evidence of four organs is required.

2.1 The description identifies organs.

2.2 The description links each organ to its function.

#### Outcome 3

Describe the function and structure of an organ system.

Range organ systems include – digestive, circulatory, excretory, gas exchange; evidence of one organ system is required.

3.1 The description identifies the function of the organ system.

3.2 The description outlines links between parts of the organ system.

<b>Subject Reference</b>		<b>Matter</b>			
<b>Title</b>		<b>Demonstrate knowledge of matter</b>			
<b>Number</b>		<b>US 18973</b>		<b>Version 6</b>	
<b>Level</b>	<b>1</b>	<b>Credits</b>	<b>2</b>	<b>Assessment</b>	<b>Internal</b>
<b>Assessment Type</b>		<b>Class test</b>	<b>Further assessment</b>		<b>Yes</b>

### Outcomes and evidence requirements

#### Outcome 1

Describe types of matter.

Range types of matter include – element, compound, mixture; evidence of two types of matter is required.

1.1 The description identifies one significant characteristic for each of the matter types.

#### Outcome 2

Describe methods used to separate substances in a mixture.

Range methods include – filtering, sieving, evaporating, simple distillation, magnetism, chromatography; evidence of three methods is required.

2.1 The description identifies how the stated method works to separate the substances in the mixture.

#### Outcome 3

Describe a simple model of an atom.

- 3.1 The description identifies parts in the model of an atom.  
Range protons, electrons, neutrons.
- 3.2 The description outlines characteristics of parts in the model of an atom.  
Range characteristics include – location, charge, number of protons compared to number of electrons.

#### Outcome 4

Describe metals and non-metals.

- Range metals include – iron, aluminium, magnesium, copper, zinc;  
non-metals include – sulfur, carbon, oxygen, nitrogen, chlorine.
- 4.1 Identify metals and non-metals by their location on the periodic table.  
Range name, symbol, atomic number;  
evidence of two metals and two non-metals is required.
- 4.2 The description outlines the physical properties of metals and non-metals.  
Range physical properties include – lustre, colour, conductivity, malleability, state, magnetism;  
evidence of two properties for metals and two properties for non-metals is required.

<b>Subject Reference</b>		<b>Chemical Reactions</b>			
<b>Title</b>		<b>Demonstrate knowledge of chemical change</b>			
<b>Number</b>		<b>US 18974</b>		<b>Version 5</b>	
<b>Level</b>	<b>1</b>	<b>Credits</b>	<b>2</b>	<b>Assessment</b>	<b>Internal</b>
<b>Assessment Type</b>		<b>Class test</b>	<b>Further assessment</b>		<b>Yes</b>

### Outcomes and evidence requirements

#### Outcome 1

Describe chemical and physical changes.

- Range two chemical changes, two physical changes.
- 1.1 The description identifies each change as being chemical or physical.
- 1.2 The description identifies features that indicate whether each change is chemical or physical.

#### Outcome 2

Describe chemical changes.

- Range chemical changes include – neutralisation, rusting, burning, precipitation;  
evidence of two chemical changes is required.
- 2.1 The description identifies the reactants or products.
- 2.2 The description outlines changes in properties.



#### Outcome 3

Describe how changing factors affect the rate of chemical reaction.

- Range factors include – temperature, concentration, surface area, reactivity, prevention methods;  
evidence of two factors is required.
- 3.1 The description links the changing factors to the rate of chemical reaction.

<b>Subject Reference</b>		<b>Science 1.7</b>			
<b>Title</b>		<b>Investigate the implications of the properties of metals for their use in society</b>			
<b>Number</b>		<b>AS90946</b>		<b>Version 3</b>	
<b>Level</b>	<b>1</b>	<b>Credits</b>	<b>4</b>	<b>Assessment</b>	<b>External</b>
<b>Assessment Type</b>		<b>Research</b>	<b>Further assessment</b>		<b>No</b>

This achievement standard involves carrying out practical activities to investigate the implications of the properties of metals for the way that they are used in society.

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Investigate the implications of the properties of metals for their use in society.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate, in depth, the implications of the properties of metals for their use in society.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate, comprehensively, the implications of the properties of metals for their use in society.</li> </ul>

### Explanatory Notes

- 1 This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 6. It is aligned with the Nature of Science and the Material World strands, and is related to the material in the *Teaching and Learning Guide for Science*, Ministry of Education, 2010 at <http://seniorsecondary.tki.org.nz>.

This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the [Papa Whakaako](#).

- 2 This investigation involves collecting information about the implications of the properties of metals for their use in society. The information could come from a variety of sources such as direct observations, collection of experimental data, resource sheets, photos, videos, websites and reference texts.

The procedures outlined in *Safety and Science: A Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000, must be followed during any practical component of the investigation.

- 3 *Investigate* involves gathering primary data, making and recording experimental observations of the physical and chemical properties of metals, and also typically includes describing, gathering, processing, interpreting, identifying, classifying and giving an account of the properties of metals and the implications for their use in society. This requires the use of chemistry vocabulary, symbols and conventions (including names and formulae), and writing word equations.

- 4 *Investigate in depth* involves making links between the physical and chemical properties of metals and the implications for their use in society. This requires explanations that use chemistry vocabulary, symbols and conventions (including names and formulae), and completing symbol equations.

- 5 *Investigate comprehensively* typically involves explaining, elaborating, justifying, relating, evaluating, comparing and contrasting, or analysing the links between the chemical and physical properties of metals and the implications of their use in society. This includes the activity series of metals and requires explanations that consistently use chemistry vocabulary, symbols and conventions (including names and formulae), including writing balanced symbol equations.

- 6 *Implications* include the consequences of particular properties for the ways that metals are extracted from their ores, treated to prevent corrosion, or used for specific purposes.

- 7 *Properties* include:

- Physical properties may include - melting point, colour, lustre, hardness, ductility and malleability, electrical and thermal conductivity, density.
- Chemical properties may include - reaction with oxygen, water and acids (HCl, H<sub>2</sub>SO<sub>4</sub>).

- 8 Conditions of Assessment related to this achievement standard can be found at <http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards>.

<b>Subject Reference</b>		<b>Space</b>			
<b>Title</b>		<b>Demonstrate knowledge of Earth and space</b>			
<b>Number</b>		<b>US 18989</b>		<b>Version 6</b>	
<b>Level</b>	<b>1</b>	<b>Credits</b>	<b>2</b>	<b>Assessment</b>	<b>Internal</b>
<b>Assessment Type</b>		<b>Class test</b>	<b>Further assessment</b>		<b>Yes</b>

## Outcomes and evidence requirements

### Outcome 1

Describe Earth cycles.

Range Earth cycles include – day, seasons, year, solstice, equinox, tides; evidence of two cycles is required.

1.1 Earth cycles are described in terms of their cause.

Range causes may include but are not limited to – rotation, tilt of the Earth, position of the sun, position of the moon in orbit.

### Outcome 2

Use given information to describe astronomical objects in space.

Range evidence of two astronomical objects is required.

2.1 The information is used to identify the objects.

2.2 The information is used to produce a description of the object.

### Outcome 3

Identify star patterns.

Range evidence of two star patterns is required.

3.1 The star patterns are identified by name.

Range patterns may include but are not limited to – Pleiadies, Crux, Orion, Scorpius, Taurus, Sagittarius.

<b>Subject Reference</b>		<b>Simple Practical</b>			
<b>Title</b>		<b>Follow instructions to carry out and report on a practical scientific activity</b>			
<b>Number</b>		<b>US 21611</b>		<b>Version 5</b>	
<b>Level</b>	<b>1</b>	<b>Credits</b>	<b>2</b>	<b>Assessment</b>	<b>Internal</b>
<b>Assessment Type</b>		<b>Class test</b>	<b>Further assessment</b>		<b>Yes</b>

## Outcomes and evidence requirements

### Outcome 1

Follow instructions to carry out and report on a practical scientific activity.

1.1 The activity is carried out in accordance with the instructions and reported on.

Range the report on the activity includes – recording results or data, processing results or data, reaching a valid conclusion.

<b>Subject Reference</b>		<b>Physics Practical</b>			
<b>Title</b>		<b>Carry out a practical physics investigation that leads to a linear mathematical relationship, with direction</b>			
<b>Number</b>		<b>AS 90935</b>		<b>Version 3</b>	
<b>Level</b>	<b>1</b>	<b>Credits</b>	<b>4</b>	<b>Assessment</b>	<b>Internal</b>
<b>Assessment Type</b>		<b>Class test</b>	<b>Further assessment</b>		<b>No</b>

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 Criteria

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

### Explanatory Notes

- 1 This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 6. It is aligned with the Physical Inquiry and Physics Concepts achievement objective in the Physical World strand and the Investigating in Science achievement objectives in the Nature of Science strand, and is related to the material in the *Teaching and Learning Guide for Physics*, Ministry of Education, 2010 at <http://seniorsecondary.tki.org.nz>.

This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the [Papa Whakaako](#).

- 2 The procedures outlined in *Safety and Science: A Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000, must be followed during the practical investigation.
- 3 *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.
- 4 A *practical investigation* is an activity that includes collecting, processing and interpreting data. The investigation must lead to a linear mathematical relationship.
- 5 *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.
- 6 *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.

7 *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.

8 Conditions of Assessment related to this achievement standard can be found at <http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards>.

<b>Subject Reference</b>		<b>Electricity and Magnetism</b>			
<b>Title</b>		<b>Investigate implications of electricity and magnetism for everyday life</b>			
<b>Number</b>		<b>AS 90941</b>		<b>Version 3</b>	
<b>Level</b>	<b>1</b>	<b>Credits</b>	<b>4</b>	<b>Assessment</b>	<b>Internal</b>
<b>Assessment Type</b>		<b>Class test</b>	<b>Further assessment</b>		<b>No</b>

This achievement standard involves investigating implications of electricity and magnetism for everyday life. *Mutual exclusion exists between this standard and AS90937.*

#### Achievement Criteria

<b>Achievement</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>
<ul style="list-style-type: none"> <li>• Investigate implications of electricity and magnetism for everyday life.</li> </ul>	<ul style="list-style-type: none"> <li>• Investigate, in- depth, implications of electricity and magnetism for everyday life.</li> </ul>	<ul style="list-style-type: none"> <li>• Investigate, comprehensively, implications of electricity and magnetism for everyday life.</li> </ul>

#### Explanatory Notes

1 This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 6. It is aligned with the Nature of Science and the Physical World strands, and is related to the material in the *Teaching and Learning Guide for Science*, Ministry of Education, 2010 at <http://seniorsecondary.tki.org.nz>.

This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the [Papa Whakaako](#).

2 *Implications of electricity and magnetism for everyday life* may relate to issues involving individuals, groups of people, society in general, the environment, or natural phenomena.



- 3 *Investigate* involves showing awareness of how science is involved in an issue that students encounter in their everyday lives. This requires at least one of the following:
- the collection of primary evidence from an investigation and relating it to the scientific theory relevant to the issue
  - the collection of secondary evidence and the identification of the scientific theory relevant to the issue under investigation. The issue must involve two different views, positions, perspectives, arguments, explanations, or opinions.

- 4 *Investigate in depth* involves providing reasons for the way science is involved in this issue. This requires at least one of the following:
- the collection of primary evidence from an investigation and relating it to the scientific theory relevant to the issue in order to give an explanation of the issue being investigated
  - the collection of sufficient relevant secondary evidence and the application of the identified scientific theory relevant to the issue to explain the different views, positions, perspectives, arguments, explanations, or opinions of the issue under investigation.

- 5 *Investigate comprehensively* involves providing reasons and linking them in a way that clearly explains the science that is involved in this issue. This requires at least one of the following:
- the collection of primary evidence from an investigation and relating it to the scientific theory relevant to the issue in order to give a comprehensive and critical explanation of the issue being investigated
  - the collection of sufficient relevant secondary evidence and the application of the identified scientific theory relevant to the issue to critically evaluate the different views, positions, perspectives, arguments, explanations, or opinions of the issue under investigation.

- 6 Aspects of *electricity and magnetism* may be chosen by the student, and include but are not limited to:

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.

Direct Current Electricity: voltage, current, resistance, power, series circuits and simple parallel circuits, circuit diagrams, the relationships that are relevant to the investigation.

Magnetism: magnetic field directions (bar magnets, the earth's magnetic field, magnetic fields due to currents in straight wires and solenoids); the right-hand grip rule; electromagnets; the relationships that are relevant to the investigation.

- 7 The procedures outlined in *Safety and Science: A Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000, must be followed during any practical component of the investigation.

- 8 Conditions of Assessment related to this achievement standard can be found at <http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards>.

<b>Subject Reference</b>		<b>Earth Science</b>			
<b>Title</b>		<b>Demonstrate knowledge of Earth science</b>			
<b>Number</b>		<b>US 18982</b>		<b>Version 6</b>	
<b>Level</b>	<b>1</b>	<b>Credits</b>	<b>2</b>	<b>Assessment</b>	<b>Internal</b>
<b>Assessment Type</b>		<b>Class test</b>	<b>Further assessment</b>		<b>Yes</b>

## Outcomes and evidence requirements

### Outcome 1

Describe the structure of the Earth.

- 1.1 The description outlines features of the Earth's structure.  
 Range features include – mantle, core, crust, plates;  
 evidence of three features is required.

### Outcome 2

Describe the formation of rocks.

- 2.1 The description outlines the process of rock formation.  
 Range processes include – sedimentary, igneous, metamorphic;  
 evidence of two processes is required.

### Outcome 3

Describe the breakdown of rocks.

- 3.1 The description outlines natural processes that break down rocks.  
 Range natural processes include – rain, wind, ice, temperature changes, mechanical weathering, chemical weathering, biological weathering;  
 evidence of three natural processes is required.

### Outcome 4

Identify rocks in a local area.

- 4.1 Rocks in a local area are identified by name and type.  
 Range types of rock include – sedimentary, igneous, metamorphic;  
 evidence of two named rocks, of any type is required.

## Further assessment Opportunities

**ONE** further assessment opportunity will be made available for all assessments **except** for AS 90941, AS90946 and AS 90935 where **NO** further assessment opportunities will be available.

**KAPITI COLLEGE ASSESSMENT STATEMENT 2016**

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During the year make sure you visit the **Kapiti College Science Web Page** on **MyKC**

The Year 11 Science page on the school's MyKC (Moodle) website (Accessible by clicking the link for Year 11 Science on the Science department page on the MyKC website)  
These web pages have material to help you with your study.

The screenshot shows the MyKC website interface. At the top, there is a search bar with the text "Search courses:" and a "Go" button. Below this is a breadcrumb trail: "Course categories: Departments / Science / Science / Year 11". A dropdown menu is open, showing "Sub-categories" with three options: "Science 101 and 111", "Science 102", and "Health Science 101". To the right of this menu is another search bar with "Add a new course" and "Search courses:" text, and a "Go" button. On the left side, there is a vertical navigation menu with the following items: "LEARNING", "DEPARTMENTS", "APPS", "STUDENTS", "STAFF", and "CO-CURRICULAR". Below this is a horizontal breadcrumb trail: "HOME > COURSES > DEPARTMENTS > SCIENCE > SCIENCE > YEAR 11". At the bottom, there is a "NAVIGATION" section with a list of links: "Home", "My home", "Site pages", "My profile", "My courses", "Courses", "Departments", "AMOL", "English", "Maths", "PE & Health", "Science", "Biology", "Chemistry", "Physics", "Science", "Year 9", "Year 10", "Year 11", "Science 101 and 111", and "Science 102".