



Inspiring the imagination  
and seeking new heights

**DE LA SALLE COLLEGE  
STUDENT HANDBOOK 2022**

**Learning Area / Subject:  
CHEMISTRY**

**CHEM201  
Year Level: 12**

**Curriculum  
Level: 7**

**NCEA LEVEL  
TWO**

**FACULTY OF SCIENCE**  
De La Salle College, 81 Gray Avenue, Mangere East, Manukau City





## CHE201 Assessment Statement 2022

Science

Course is endorsable

Year : 12

Course : Chemistry

Mr K Raukura

Total Credits : 23

This is a course based on Level 7 of the Chemistry Curriculum. Students develop practical skills in chemical analysis. The course also helps students develop an understanding of the structure of chemical compounds and how they behave in a range of different chemical reactions. Students will study topics ranging from identifying unknown ions, carrying out analysis, looking at the structure and bonding within molecules, gaining understanding of organic chemicals and chemical reactivity.

**Pre Requisites**

12 Level 1 Science Credits including the the Acid and Base Achievement Standards offered in either General Science or Advanced Science.

**Additional Requirements**

Year 12 Chemistry Student workbook \$40  
Scientific Calculator

No	Standard Number	Version	Level	Credits	Lit / Num	Full Title	Method of Assessment	Assessment Opportunities Offered	Approximate Date	Grade	Teacher Signature
1	91167	2	2	3		Chemistry 2.7 - Demonstrate understanding of oxidation-reduction	Practical	1	Week 10 Term 2		
2	91910	1	2	4	Num	Chemistry 2.1 - Carry out a practical investigation into a substance present in a consumer product using quantitative analysis	Assignment	1	Week 6 Term 1		
3	91911	1	2	3		Chemistry 2.2 - Carry out an investigation into chemical species present in a sample using qualitative analysis	Assignment	1	Week 4 Term 3		
4	91164	2	2	5	L1 Lit	Chemistry 2.4 - Demonstrate understanding of bonding, structure, properties and energy changes	Exam	External			
5	91165	2	2	4	L1 Lit	Chemistry 2.5 - Demonstrate understanding of the properties of selected organic compounds	Exam	External			
6	91166	2	2	4	L1 Lit	Chemistry 2.6 - Demonstrate understanding of chemical reactivity	Exam	External			

School Assessment Procedures - You can view your rights and obligations in the school's assessment procedures in the **Student Assessment Handbook**

Record your internal grades and ask your teacher to sign it off as correct. You can then use this as evidence of your achievement.

## 2022 Course Outline – Y12 Chemistry (CHEM201)

**Subject:** Chemistry

**NCEA Level:** Two

**Entry Requirements:** a minimum of 12 credits from NCEA Level One Science

**Number of credits gained:** 23

**Method of assessment:**

- Both internal and external assessment
- Internal assessments are given after a series of mock practice runs where practical
- Mock externals at the end of each unit of work
- Mid-Year Examinations
- Preliminary Examinations

**Looking Ahead:**

- Level 3 Chemistry
- Tertiary level study
- A diverse range of careers stem from Chemistry -  
e.g. brewery worker, baker, food technologist, community pharmacist, forensic scientist, fishery officer, geologist.

### Course Description

**Course aims:**

This course is aimed at those students who have achieved well in Year 11 and who know that they wish to pursue a career that requires. Such careers include engineering, medicine, materials, pharmaceuticals and much more.

The course consists of Achievement Standards from the Level 2 Chemistry course.

**Course learning outcomes:**

- To be able to carry out the correct procedures and to use knowledge of precipitation reactions to determine the ions present in a solution.
- To be able to carry out an acid-base volumetric analysis using a given titration procedure, therefore determining the concentration of an unknown solution.
- To be able to solve simple quantitative chemical problems
- To be able to describe the bonding in simple molecules and the nature of various types of solids.
- To be able to describe the structural formulae and reactions of compounds containing selected organic functional groups.
- To be able to understand the principles of chemical reactivity by describing and using simple thermochemical and equilibrium information.
- To be able to describe oxidation-reduction reactions using oxidation number, loss or gain of electrons and/or oxygen and /or hydrogen.

## 2022 Course Assessment Statement – Y12 Chemistry (CHEM201)

### HOW WILL I BE ASSESSED IN THIS SUBJECT?

Achievement Standard	Level and Credit Value	Internal or External Assessment	Brief Description	My grade for prelims	My final grade for internals
<b>CHEM AS2.1</b> 91910 (NEW)	L2 4 credits	Internal	Carry out a practical investigation into a substance present in a consumer product using quantitative analysis.		
<b>CHEM AS2.2</b> 91911 (NEW)	L2 3 credits	Internal	Carry out an investigation into chemical species present in a sample using qualitative analysis.		
<b>CHEM AS2.7</b> 91167	L2 3 credits	Internal	Demonstrate understanding of oxidation–reduction – using taught knowledge on redox reactions you will show understanding of various examples in a written test.		
<b>CHEM AS2.4</b> 91164	L2 5 credits	External	Demonstrate understanding of bonding, structure, and energy changes – you will learn about diff. bond types and the 3D structure of molecules. Plus exo/endothemic reactions.		
<b>CHEM AS2.5</b> 91165	L2 4 credits	External	Demonstrate understanding of the properties of selected organic compounds – you will learn about carbon compounds. Their functional groups, preparation, and reactions.		
<b>CHEM AS2.6</b> 91166	L2 4 credits	External	Demonstrate understanding of chemical reactivity – this standard covers rates of reaction and equilibrium.		

**Note: Depending on class ability. Extra internal assessments might be added if required and if the challenge and time is warranted.**



## De La Salle College – Chemistry Level 2 (CHEM201) - Year Planner 2022

Subject: 12 Chemistry

Teacher in charge: Mr. Kane Raukura

Year Level: 12

Curriculum Levels: 7

<p><b>Unit Title:</b> CHEM AS2.1: 91910 (NEW - Chemistry Internal) – Carry out a practical investigation into a substance present in a consumer product using quantitative analysis.</p> <p><b>Achievement objectives:</b></p> <ul style="list-style-type: none"><li>Investigate and measure the chemical and physical properties of a range of groups of substances, for example, acids and bases, oxidants, and reductants, and selected organic and inorganic compounds.</li><li>Develop an understanding of and use the fundamental concepts of chemistry (for example, equilibrium and thermochemical principles) to interpret observations.</li></ul> <p><b>Learning outcomes/skills:</b></p> <ul style="list-style-type: none"><li>To be able to carry out an acid-base volumetric analysis using a given titration procedure, therefore determining the concentration of an unknown solution.</li></ul> <p><b>Assessment tasks/method:</b></p> <ul style="list-style-type: none"><li>developing a workable plan to determine if the consumer product sample and/or titration procedure requires modification</li><li>collecting, recording, and processing a sufficient quantity of data to enable a conclusion to be reached</li><li>determining the concentration of a substance relevant to the investigation</li><li>describing how significant variables were controlled in the investigation.</li></ul> <p><b>Key competencies:</b> Thinking, managing self, Using language, symbols, and texts.</p> <p><b>Values:</b> Innovation, inquiry and curiosity, excellence</p> <p><b>Approximate time required:</b> 6 weeks</p>	<p><b>Unit Title:</b> CHEM AS2.2: 91911 (NEW - Chemistry Internal) – Carry out an investigation into chemical species present in a sample using qualitative analysis.</p> <p><b>Achievement objectives:</b></p> <ul style="list-style-type: none"><li>Investigate and measure the chemical and physical properties of a range of groups of substances, for example, acids and bases, oxidants, and reductants, and selected organic and inorganic compounds.</li><li>Develop an understanding of and use the fundamental concepts of chemistry (for example, equilibrium and thermochemical principles) to interpret observations.</li></ul> <p><b>Learning outcomes/skills:</b></p> <ul style="list-style-type: none"><li>To be able to carry out the correct procedures and to use knowledge of precipitation reactions to determine the ions present in a solution.</li></ul> <p><b>Assessment tasks/method:</b></p> <ul style="list-style-type: none"><li>collecting primary data using an identification procedure</li><li>identifying chemical species present by matching primary data to the procedure</li><li>linking the chemical species to the compound present in the sample</li><li>describing the significance of an identified chemical species for people and/or the environment.</li></ul> <p><b>Key competencies:</b> Thinking, managing self, using language, symbols, and texts, Participating, and contributing.</p> <p><b>Values:</b> Inquiry and curiosity, excellence, respect.</p> <p><b>Approximate time required:</b> 3 weeks</p>	<p><b>Unit Title:</b> AS91167 (AS2.7 Chemistry Internal) – Demonstrate understanding of oxidation – reduction.</p> <p><b>Achievement objectives:</b></p> <ul style="list-style-type: none"><li>Investigate and measure the chemical and physical properties of a range of groups of substances, for example, acids and bases, oxidants, and reductants, and selected organic and inorganic compounds.</li><li>Develop an understanding of and use the fundamental concepts of chemistry (for example, equilibrium and thermochemical principles) to interpret observations.</li></ul> <p><b>Learning outcomes/skills:</b></p> <ul style="list-style-type: none"><li>To be able to describe oxidation-reduction reactions using oxidation number, loss or gain of electrons and/or oxygen and /or hydrogen.</li></ul> <p><b>Assessment tasks/method:</b></p> <ul style="list-style-type: none"><li>A written report showing a clear understanding of a variety of different oxidation-reduction reactions.</li><li>Using oxidation numbers</li><li>Balancing <math>\frac{1}{2}</math> and full redox equations</li><li>Relating observations to theory.</li></ul> <p><b>Key competencies:</b> Thinking, managing self, using language, symbols, and texts, Participating, and contributing.</p> <p><b>Values:</b> Inquiry and curiosity, excellence.</p> <p><b>Approximate time required:</b> 3 weeks</p>
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<p><b>Unit Title:</b> AS91164 (AS2.4 Chemistry External) – Demonstrate understanding of bonding, structure, and energy changes.</p> <p><b>Achievement objectives:</b></p> <ul style="list-style-type: none"> <li>• Relate properties of matter to structure and bonding.</li> <li>• Develop an understanding of and use the fundamental concepts of chemistry (for example, equilibrium and thermochemical principles) to interpret observations.</li> <li>• Apply knowledge of chemistry to explain aspects of the natural world and how chemistry is used in society to meet needs, resolve issues, and develop new technologies.</li> </ul> <p><b>Learning outcomes/skills:</b></p> <ul style="list-style-type: none"> <li>• To be able to describe the bonding in simple molecules and the nature of various types of solids.</li> </ul> <p><b>Assessment tasks/method:</b></p> <ul style="list-style-type: none"> <li>• Mid-Year Mock Examinations (Term 2).</li> <li>• Preliminary Mock Examinations (Term 3).</li> <li>• External NCEA examination at year's end.</li> </ul> <p><b>Key competencies:</b> Thinking, managing self, using language, symbols, and texts, Participating, and contributing.</p> <p><b>Values:</b> Inquiry and curiosity, Excellence.</p> <p><b>Approximate time required:</b> 6 weeks</p>	<p><b>Unit Title:</b> AS91165 (AS2.5 Chemistry External) – Demonstrate understanding of properties of selected organic compounds.</p> <p><b>Achievement objectives:</b></p> <ul style="list-style-type: none"> <li>• Investigate and measure the chemical and physical properties of a range of groups of substances, for example, acids and bases, oxidants, and reductants, and selected organic and inorganic compounds.</li> <li>• Apply knowledge of chemistry to explain aspects of the natural world and how chemistry is used in society to meet needs, resolve issues, and develop new technologies.</li> </ul> <p><b>Learning outcomes/skills:</b></p> <ul style="list-style-type: none"> <li>• To be able to describe the structural formulae and reactions of compounds containing selected organic functional groups.</li> </ul> <p><b>Assessment tasks/method:</b></p> <ul style="list-style-type: none"> <li>• Mid-Year Mock Examinations (Term 2).</li> <li>• Preliminary Mock Examinations (Term 3).</li> <li>• External NCEA examination at year's end.</li> </ul> <p><b>Key competencies:</b> Thinking, managing self, using language, symbols, and texts, Participating, and contributing.</p> <p><b>Values:</b> Inquiry and curiosity, excellence, innovation.</p> <p><b>Approximate time required:</b> 6 weeks</p>	<p><b>Unit Title:</b> AS91166 (AS2.6 Chemistry External) – Demonstrate understanding of chemical reactivity.</p> <p><b>Achievement objectives:</b></p> <ul style="list-style-type: none"> <li>• Develop an understanding of and use the fundamental concepts of chemistry (for example, equilibrium and thermochemical principles) to interpret observations.</li> <li>• Apply knowledge of chemistry to explain aspects of the natural world and how chemistry is used in society to meet needs, resolve issues, and develop new technologies.</li> </ul> <p><b>Learning outcomes/skills:</b></p> <ul style="list-style-type: none"> <li>• To be able to understand the principles of chemical reactivity by describing and using simple rate, thermochemical and equilibrium information.</li> </ul> <p><b>Assessment tasks/method:</b></p> <ul style="list-style-type: none"> <li>• Mid-Year Mock Examinations (Term 2).</li> <li>• Preliminary Mock Examinations (Term 3).</li> <li>• External NCEA examination at year's end.</li> </ul> <p><b>Key competencies:</b> Thinking, managing self, using language, symbols, and texts, Participating, and contributing.</p> <p><b>Values:</b> Inquiry and curiosity, Excellence.</p> <p><b>Approximate time required:</b> 6 weeks</p>
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### Achievement Standard

<b>Subject Reference</b>	Chemistry 2.1		
<b>Title</b>	Carry out a practical investigation into a substance present in a consumer product using quantitative analysis		
<b>Level</b>	2	<b>Credits</b>	4
		<b>Assessment</b>	Internal
<b>Subfield</b>	Science		
<b>Domain</b>	Chemistry		
<b>Status</b>	Registered	<b>Status date</b>	29 November 2018
<b>Planned review date</b>	31 December 2020	<b>Date version published</b>	29 November 2018

This achievement standard involves carrying out a practical investigation into a substance present in a consumer product using quantitative analysis.

#### Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Carry out a practical investigation into a substance present in a consumer product using quantitative analysis.</li> </ul>	<ul style="list-style-type: none"> <li>Carry out an in-depth practical investigation into a substance present in a consumer product using quantitative analysis.</li> </ul>	<ul style="list-style-type: none"> <li>Carry out a comprehensive practical investigation into a substance present in a consumer product using quantitative analysis.</li> </ul>

#### Explanatory Notes

- 1 This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 7. The standard is aligned to the Nature of Science achievement objectives and the Material World achievement objectives:
- Investigating in Science – Develop and carry out investigations that extend their science knowledge, including developing their understanding of the relationship between investigations and scientific theories and models
  - Communicating in Science – Use accepted science knowledge, vocabulary, symbols, and conventions when evaluating accounts of the natural world and consider the wider implications of methods of communication and/or representation employed;
- and is related to the material in the *Teaching and Learning Guide for Chemistry*, Ministry of Education at <http://seniorsecondary.tki.org.nz>.

This standard is also derived from *Te Marautanga o Aotearoa*. For details of *Te Marautanga o Aotearoa* outcomes to which this standard relates, see the [Papa Whakaako](#) for the relevant learning area.

Safety procedures outlined in *Safety and Science: A Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000, should be followed: <https://stanz.nzase.org.nz/app/uploads/2015/05/Safety-and-Science.pdf>.

- 2 Carry out a practical investigation into a substance present in a consumer product using quantitative analysis involves:
- developing a workable plan to determine if the consumer product sample and/or titration procedure requires modification
  - collecting, recording and processing a sufficient quantity of data to enable a conclusion to be reached
  - determining the concentration of a substance relevant to the investigation
  - describing how significant variables were controlled in the investigation.

Carry out an in-depth practical investigation into a substance present in a consumer product using quantitative analysis involves:

- using results from preliminary trials to develop a valid plan to modify the consumer product sample and/or titration procedure
- collecting, recording and processing quality data that enables a valid conclusion to be reached
- accurately determining the concentration of the standard solution; and the substance present
- explaining how control of variables improved the quality of the investigation.

Carry out a comprehensive practical investigation into a substance present in a consumer product using quantitative analysis involves:

- accurately determining the concentration of the substance in the consumer product, including correct use of significant figures and units
- justifying how modifying the consumer product sample and/or the titration procedure improved the validity and accuracy of the investigation
- evaluating the outcome of the investigation in relation to the consumer product.

- 3 A practical investigation is an activity involving planning and carrying out the investigation, collecting primary data, processing and interpreting data, and reporting on the investigation. Students may make changes to their initial method as they work through the investigation.
- 4 Quantitative analysis involves using a titration procedure to determine the concentration of a substance present in a given sample.
- 5 The titration must be one of:
- acid-base
  - complexometric
  - precipitation
  - oxidation-reduction.
- 6 Determination of the concentration of a substance must involve the use of stoichiometric principles and both the relationships  $n=m/M$  and  $c=n/V$ .
- 7 Conditions of Assessment related to this achievement standard can be found at <http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards>.



### Achievement Standard

<b>Subject Reference</b>	Chemistry 2.2		
<b>Title</b>	Carry out an investigation into chemical species present in a sample using qualitative analysis		
<b>Level</b>	2	<b>Credits</b>	3
		<b>Assessment</b>	Internal
<b>Subfield</b>	Science		
<b>Domain</b>	Chemistry		
<b>Status</b>	Registered	<b>Status date</b>	29 November 2018
<b>Planned review date</b>	31 December 2020	<b>Date version published</b>	29 November 2018

This achievement standard involves carrying out an investigation into chemical species present in a sample using qualitative analysis.

#### Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Carry out an investigation into chemical species present in a sample using qualitative analysis.</li> </ul>	<ul style="list-style-type: none"> <li>Carry out an in-depth investigation into chemical species present in a sample using qualitative analysis.</li> </ul>	<ul style="list-style-type: none"> <li>Carry out a comprehensive investigation into chemical species present in a sample using qualitative analysis.</li> </ul>

#### Explanatory Notes

- 1 This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 7. The standard is aligned to the Nature of Science achievement objectives and the Material World achievement objectives:
- Investigating in Science – Develop and carry out investigations that extend their science knowledge, including developing their understanding of the relationship between investigations and scientific theories and models
  - Communicating in Science – Use accepted science knowledge, vocabulary, symbols, and conventions when evaluating accounts of the natural world and consider the wider implications of methods of communication and representation employed
  - Participating and Contributing - Use relevant information to develop a coherent understanding of socio-scientific issues that concern them, to identify possible responses at both personal and societal levels;
- and is related to the material in the *Teaching and Learning Guide for Chemistry*, Ministry of Education at <http://seniorsecondary.tki.org.nz>.

This standard is also derived from *Te Marautanga o Aotearoa*. For details of *Te Marautanga o Aotearoa* outcomes to which this standard relates, see the [Papa Whakaako](#) for the relevant learning area.

Safety procedures outlined in *Safety and Science: A Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000, should be followed: <https://stanz.nzase.org.nz/app/uploads/2015/05/Safety-and-Science.pdf>.

- 2 Carry out an investigation into chemical species present in a sample using qualitative analysis involves:
- collecting primary data using an identification procedure
  - identifying chemical species present by matching primary data to the procedure
  - linking the chemical species to the compound present in the sample
  - describing the significance of an identified chemical species for people and/or the environment.
- Carry out an in-depth investigation into chemical species present in a sample using qualitative analysis involves:
- explaining the identification of chemical species present by linking the primary data to the procedure
  - writing relevant equations to explain all the changes occurring during the identification procedure
  - explaining the significance of an identified chemical species for people and/or the environment.
- Carry out a comprehensive investigation into chemical species present in a sample using qualitative analysis involves:
- justifying the identification of chemical species present by linking secondary data and chemical principles to the reactions occurring during the analysis
  - discussing the significance of an identified chemical species for people and/or the environment.
- 3 An identification procedure may include:
- identifying ions based on solubility rules and the formation of complex ions
  - identifying organic compounds based on functional group reactions.
- 4 Secondary data may include:
- solubility rules and formulae of complex ions
  - a functional group reaction map
  - relevant scientific literature.
- 5 Conditions of Assessment related to this achievement standard can be found at <http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards>.

#### Replacement Information

This achievement standard replaced AS91162.

### Achievement Standard

<b>Subject Reference</b>	Chemistry 2.4		
<b>Title</b>	Demonstrate understanding of bonding, structure, properties and energy changes		
<b>Level</b>	2	<b>Credits</b>	5
		<b>Assessment</b>	External
<b>Subfield</b>	Science		
<b>Domain</b>	Chemistry		
<b>Status</b>	Registered	<b>Status date</b>	17 November 2011
<b>Planned review date</b>	31 December 2018	<b>Date version published</b>	20 November 2014

This achievement standard involves demonstrating understanding of bonding, structure, properties and energy changes.

#### Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Demonstrate understanding of bonding, structure, properties and energy changes.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate in-depth understanding of bonding, structure, properties and energy changes.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate comprehensive understanding of bonding, structure, properties and energy changes.</li> </ul>

#### Explanatory Notes

- This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 7. The standard is aligned to the Nature of Science achievement objectives and the Material World achievement objectives, and is related to the material in the *Teaching and Learning Guide for Chemistry*, 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](#) for the relevant learning area.

- Procedures outlined in *Safety and Science: a Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000 should be followed.
- Demonstrate understanding* involves describing, identifying, naming, drawing, calculating, or giving an account of bonding, structure and properties of different substances and the energy involved in physical and chemical changes. This requires the use of chemistry vocabulary, symbols and conventions.

*Demonstrate in-depth understanding* involves making and explaining links between the bonding, structure and properties of different substances and the energy involved in physical and chemical changes. This requires explanations that use chemistry vocabulary, symbols and conventions.

*Demonstrate comprehensive understanding* involves elaborating, justifying, relating, evaluating, comparing and contrasting, or analysing links between bonding, structure and properties of different substances and the energy involved in physical and chemical changes. This requires the consistent use of chemistry vocabulary, symbols and conventions.

- Bonding, structure and energy changes* are limited to:
  - ionic, covalent and metallic bonding
  - intermolecular forces (the distinction between the different types of intermolecular forces is not required)
  - Lewis structures, shape and polarity of simple molecules. Simple molecules have no more than four electron pairs about any atom (including multiple-bonded species)
  - molecular, ionic, metallic and covalent network substances
  - exothermic and endothermic reactions including energy (enthalpy) changes associated with differing amounts of substances and changes of state and enthalpy changes associated with the making and breaking of chemical bonds
  - calculations of energy changes using  $\Delta_r H$  and reaction stoichiometry, and bond enthalpy.
- Properties* are limited to hardness, malleability, ductility, electrical conductivity, melting and boiling points and solubility.
- Assessment Specifications for this achievement standard can be accessed through the Chemistry Resources page found at <http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/ncea-subject-resources/>.

#### Replacement Information

This achievement standard replaced unit standard 8944 and AS90308.

### Achievement Standard

<b>Subject Reference</b>	Chemistry 2.5		
<b>Title</b>	Demonstrate understanding of the properties of selected organic compounds		
<b>Level</b>	2	<b>Credits</b>	4
		<b>Assessment</b>	External
<b>Subfield</b>	Science		
<b>Domain</b>	Chemistry		
<b>Status</b>	Registered	<b>Status date</b>	17 November 2011
<b>Planned review date</b>	31 December 2018	<b>Date version published</b>	20 November 2014

This achievement standard involves demonstrating understanding of the properties of selected organic compounds.

#### Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Demonstrate understanding of the properties of selected organic compounds.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate in-depth understanding of the properties of selected organic compounds.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate comprehensive understanding of the properties of selected organic compounds.</li> </ul>

#### Explanatory Notes

- This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 7. The standard is aligned to the Nature of science achievement objectives and the Material World achievement objectives, and is related to the material in the *Teaching and Learning Guide for Chemistry*, 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](#) for the relevant learning area.

- Procedures outlined in *Safety and Science: a Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000 should be followed.
- Demonstrate understanding* involves naming and/or drawing structural formulae of selected organic compounds (no more than eight carbons in the longest chain) and

giving an account of their chemical and physical properties. This requires the use of chemistry vocabulary, symbols and conventions.

*Demonstrate in-depth understanding* involves making and explaining links between structure, functional groups and the chemical properties of selected organic compounds. This requires explanations that use chemistry vocabulary, symbols and conventions.

*Demonstrate comprehensive understanding* involves elaborating, justifying, relating, evaluating, comparing and contrasting, or using links between the structure, functional groups and the chemical properties of selected organic compounds. This requires the consistent use of chemistry vocabulary, symbols and conventions.

*Selected organic compounds* are limited to: alkanes, alkenes, alkynes, haloalkanes, primary amines, alcohols, and carboxylic acids.

*Properties* are limited to:

- constitutional and geometric (*cis and trans*) isomers
- classification of alcohols and haloalkanes as primary, secondary or tertiary
- solubility, melting and boiling points
- chemical reactions.

- Chemical reactions are limited to:
  - addition reactions of alkenes with  $H_2/Pt$ ,  $Cl_2$ ,  $Br_2$ ,  $H_2O/H^+$  (conc.  $H_2SO_4/H_2O$ ) and hydrogen halides (including identification of major and minor products on addition to asymmetric alkenes), polymerisation
  - substitution reactions of:
    - alkanes with halogens (limited to monosubstitution)
    - alcohols with hydrogen halides,  $PCl_3$ ,  $PCl_5$ ,  $SOCl_2$
    - haloalkanes with ammonia and aqueous potassium hydroxide
  - oxidation of:
    - primary alcohols to form carboxylic acids with  $MnO_4^-/H^+$  or  $Cr_2O_7^{2-}/H^+$
    - alkenes with  $MnO_4^-$
  - elimination of (including identification of major and minor products for asymmetric reactants):
    - water from alcohols
    - hydrogen halides from haloalkanes
  - acid-base reactions of carboxylic acids and amines.
- Assessment Specifications for this achievement standard can be accessed through the Chemistry Resources page found at <http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/ncea-subject-resources/>.

#### Replacement Information

This achievement standard replaced AS90309.

**Achievement Standard**

<b>Subject Reference</b>	Chemistry 2.6		
<b>Title</b>	Demonstrate understanding of chemical reactivity		
<b>Level</b>	2	<b>Credits</b>	4
		<b>Assessment</b>	External
<b>Subfield</b>	Science		
<b>Domain</b>	Chemistry		
<b>Status</b>	Registered	<b>Status date</b>	17 November 2011
<b>Planned review date</b>	31 December 2018	<b>Date version published</b>	20 November 2014

This achievement standard involves demonstrating understanding of chemical reactivity.

**Achievement Criteria**

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Demonstrate understanding of chemical reactivity.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate in-depth understanding of chemical reactivity.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate comprehensive understanding of chemical reactivity.</li> </ul>

**Explanatory Notes**

- 1 This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 7. The standard is aligned to the Nature of Science achievement objectives and the Material World achievement objectives; and is related to the material in the *Teaching and Learning Guide for Chemistry*, 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](#) for the relevant learning area.

- 2 Procedures outlined in *Safety and Science: a Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000 should be followed.
- 3 *Demonstrate understanding* involves describing, identifying, naming, drawing, calculating, or giving an account of chemical reactivity. This requires the use of chemistry vocabulary, symbols and conventions.

*Demonstrate in-depth understanding* involves explaining chemical reactivity. This requires explanations that use chemistry vocabulary, symbols and conventions.

*Demonstrate comprehensive understanding* involves elaborating, justifying, relating, evaluating, comparing and contrasting, or analysing chemical reactivity. This requires the consistent use of chemistry vocabulary, symbols and conventions.

*Chemical reactivity* is limited to rates of reaction and equilibrium principles.

- 4 Rates of reaction involve:
- factors affecting rates of reaction – restricted to changes in concentration, temperature, surface area, and the presence of a catalyst
  - using collision theory to explain the factors (includes activation energy).
- 5 *Equilibrium principles* are limited to:
- the dynamic nature of equilibrium
  - the effect of changes in temperature, concentration, pressure, or addition of a catalyst on equilibrium systems
  - the significance of the equilibrium constant ( $K_c$ ) for homogeneous systems. This may involve calculations
  - the nature of acids and bases in terms of proton transfer
  - properties of aqueous solutions of strong and weak acids and bases including ionic species. The properties are restricted to conductivity, rate of reaction, and pH
  - calculations involving  $K_w$  and pH (restricted to strong acids and bases).
- 6 Assessment Specifications for this achievement standard can be accessed through the Chemistry Resources page found at <http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/ncea-subject-resources/>.

**Replacement Information**

This achievement standard replaced AS90310.

**Quality Assurance**

- 1 Providers and Industry Training Organisations must have been granted consent to assess by NZQA before they can register credits from assessment against achievement standards.
- 2 Organisations with consent to assess and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Consent and Moderation Requirements (CMR) reference 0233

**Achievement Standard**

<b>Subject Reference</b>	Chemistry 2.7		
<b>Title</b>	Demonstrate understanding of oxidation-reduction		
<b>Level</b>	2	<b>Credits</b>	3
		<b>Assessment</b>	Internal
<b>Subfield</b>	Science		
<b>Domain</b>	Chemistry		
<b>Status</b>	Registered	<b>Status date</b>	17 November 2011
<b>Planned review date</b>	31 December 2018	<b>Date version published</b>	20 November 2014

This achievement standard involves demonstrating understanding of oxidation-reduction.

**Achievement Criteria**

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Demonstrate understanding of oxidation-reduction.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate in-depth understanding of oxidation-reduction.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate comprehensive understanding of oxidation-reduction.</li> </ul>

**Explanatory Notes**

- This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 7. The standard is aligned to the Nature of Science achievement objectives and the Material World achievement objectives, and is related to the material in the *Teaching and Learning Guide for Chemistry*, 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](#) for the relevant learning area.

- Procedures outlined in *Safety and Science: a Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000 should be followed.
- Demonstrate understanding* involves describing, identifying, naming, giving an account of oxidation-reduction and describing oxidation-reduction reactions. This requires the use of chemistry vocabulary, symbols and conventions.

*Demonstrate in-depth understanding* involves making and explaining links between oxidation-reduction reactions, observations and equations. This requires explanations that use chemistry vocabulary, symbols and conventions.

*Demonstrate comprehensive understanding* involves justifying, evaluating, comparing and contrasting, or analysing links between oxidation-reduction reactions, observations and equations. This requires the consistent use of chemistry vocabulary, symbols and conventions.

- Oxidation-reduction* is limited to:
  - oxidation numbers
  - electron transfer in reactions
  - oxidants and/or reductants
  - observations for reactions
  - balanced oxidation-reduction half equations
  - overall balanced oxidation-reduction equations.
- Knowledge of the appearance of redox reactants and their products includes a selection from, but is not limited to:
  - oxidants include a selection from, but not limited to:  $O_2$ ,  $I_2$ ,  $Br_2$ ,  $Cl_2$ ,  $OCI^-$ ,  $H^+$ ,  $Fe^{3+}$ ,  $Cu^{2+}$ ,  $H_2O_2$ ,  $MnO_4^-/H^+$ ,  $Cr_2O_7^{2-}/H^+$ , concentrated  $HNO_3$ ,  $IO_3^-$
  - reductants include a selection from, but not limited to, metals, C,  $H_2$ ,  $Fe^{2+}$ ,  $Br^-$ ,  $I^-$ ,  $H_2S$ ,  $SO_2$ ,  $SO_3^{2-}$ ,  $HSO_3^-$ ,  $H_2O_2$
- Conditions of Assessment related to this achievement standard can be found at <http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards>.

**Replacement Information**

This achievement standard replaced unit standard 8947 and AS90311.

**Quality Assurance**

- Providers and Industry Training Organisations must have been granted consent to assess by NZQA before they can register credits from assessment against achievement standards.
- Organisations with consent to assess and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Consent and Moderation Requirements (CMR) reference

0233

## **2022 Chemistry Level 2 (CHEM201) – Student Guide to Bibliographies / Referencing**

A bibliography is the ‘trail’ of reading that you did to inform your thinking for your essay or assignment. A bibliography is organised alphabetically by the author’s last name.

Setting up a bibliography

(a) Books

- Author’s last name and initial
- Date published – in brackets
- Name of book underlined
- Place of publication
- Publisher

Single Author

E.g. Ward, M. (1995) Celebrating Women Cambridge, University Press

More than one author

E.g. Edwards, B., Horrocks, N. (1992) Reporting for Television Palmerston North, Dunmore Press

(b) Journals, Magazines, Newspapers

- Author’s name and initial
- Date published – in brackets
- Title of the article in quotation marks
- Name of paper or magazine –underlined
- Place of publication
- Volume (if applicable)
- Page number

E.g. Booth, P. (1986) “The Arthur Thomas Case Revisited” NZ Herald Feb 11, 2: 13

(c) Internet

- Author’s name and initial if available
- Article name if appropriate
- Full date of resource if available
- Date of access
- Site address

E.g. Midbon, M (2000), Jan 13 2004 A Day Without Yesterday: George Lemaitre and the Big Bang  
<http://catholiceducation.org/articles/science/sc0022.html>

To create automatically correct references, the following website is useful. It will create references for ISBN numbers and webpages.

[www.harvardgenerator.com](http://www.harvardgenerator.com)

**De La Salle College  
Assessment Result Appeal Form 2022**

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Name/number of standard being appealed: \_\_\_\_\_

Subject: \_\_\_\_\_

Teacher who marked work: \_\_\_\_\_

Grade awarded for standard: \_\_\_\_\_

Date work returned to student: \_\_\_\_\_

Date of appeal: \_\_\_\_\_

Reason for appeal:

Student signature: \_\_\_\_\_

Caregiver's signature: \_\_\_\_\_

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**OFFICE USE ONLY**

Teacher response:

HOF response:

Principal's Nominee response:

Final decision:

**De La Salle College**  
**Absence from Internal Assessment**  
**Application for Extension 2022**

Student: \_\_\_\_\_ Class: \_\_\_\_\_  
Subject: \_\_\_\_\_ Teacher: \_\_\_\_\_

Assessment title: \_\_\_\_\_

Standard number: \_\_\_\_\_

Type of assessment activity (*test, practical, assignment etc*).

Date of assessment or due date: \_\_\_\_\_

**Reason for application:**

- Illness or injury: *medical certificate or a letter from parent / caregiver* must be attached.
- Family / personal trauma: documentation must be attached (*e.g. a letter from parent / caregiver, counsellor, or Dean*).
- School activity (*sporting or cultural*) \_\_\_\_\_

Signature of the teacher-in-charge of the activity: \_\_\_\_\_

**Decision by Principal's Nominee:**

- Extension granted, new due date: \_\_\_\_\_
- New assessment granted, new date: \_\_\_\_\_
- Compassionate consideration will be used to determine a grade. HOD / TIC to attach documentation of evidence used to determine the grade and the grade awarded.
- Application denied. Comment: \_\_\_\_\_
- \_\_\_\_\_

The reason for this has been explained to me and I accept the decision.

Signed: \_\_\_\_\_ (Student) \_\_\_\_\_ (Teacher)