

Title	Demonstrate knowledge of the periodic table and properties of selected elements		
Level	4	Credits	7

Purpose	People credited with this unit standard are able to: demonstrate knowledge of the periodic table; describe atomic properties of the elements; explain the shapes of molecules and ions; and describe the acid-base behaviour of oxides and halides, and the redox properties of halogens.
----------------	---

Classification	Science > Chemistry
-----------------------	---------------------

Available grade	Achieved
------------------------	----------

Guidance Information

- All work must be carried out in accordance with the quality management system, documented protocol system or Standard Operating Procedures typically acceptable in a commercial or research laboratory.
- Health and Safety practices must conform to Australian/New Zealand Standard AS/NZS 2243:2010 Set – *Safety in Laboratories*, available at <http://www.standards.co.nz> and <http://infostore.saiglobal.com/store>.
- Legislation applicable to this unit standard includes:
Health and Safety at Work Act 2015;
Hazardous Substances and New Organisms Act 1996.
- Glossary
VSEPR theory refers to valence shell electron pair repulsion theory which is a model used to predict the shape of individual molecules and ions based upon the extent of electron-pair electrostatic repulsion.
- Selected elements are limited to elements of atomic number 1-38; plus Ag, Cd, In, Sn, Sb, Te, I, Xe, Cs, Ba, Au, Hg, Tl, Pb, Bi, Rn, Fr, Ra.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of the periodic table.

Performance criteria

- 1.1 The periods, groups, and blocks of elements are described according to their chemical properties and position in the periodic table.
- 1.2 Elements are ordered according to their atomic number and electron configuration in the periodic table.
- 1.3 Metals, metalloids, and non-metals are indicated on the periodic table.

Outcome 2

Describe atomic properties of the elements.

Performance criteria

- 2.1 Atomic properties of elements are described and defined according to their position in the periodic table.
- Range properties include - atomic radius, covalent radius, ionic radius, ionisation energy, electron affinity, electronegativity, atomic volume.
- 2.2 Trends in atomic properties are identified and explained in relation to the periodic table.

Outcome 3

Explain the shapes of molecules and ions.

Range molecules and ions which can be classified as AX_xE_y where A is the central atom, X a peripheral atom, and E a non-bonding electron pair.

Performance criteria

- 3.1 The shapes of molecules and ions are explained consistent with VSEPR theory.
- Range shapes include – tetrahedral, octahedral, square planar.

Outcome 4

Describe the acid-base behaviour of oxides.

Performance criteria

- 4.1 Acid-base behaviour of oxides is described with regard to position in the periodic table.
- Range oxides include – s block, p block.

Outcome 5

Describe the acid-base behaviour of halides, and the redox properties of halogens.

Performance criteria

- 5.1 Acid-base behaviour of halides is described with regard to position in the periodic table.
- 5.2 The redox properties of halogens are described in relation to the periodic table.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	23 November 1999	31 December 2014
Review	2	18 June 2010	31 December 2022
Rollover	3	27 January 2015	31 December 2022
Rollover and Revision	4	15 June 2017	31 December 2022
Revision	5	26 October 2017	31 December 2022
Review	6	22 October 2020	31 December 2022

Consent and Moderation Requirements (CMR) reference	0113
--	------

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.