

Achievement Standard

Subject Reference Chemistry and Biology 1.2

Title Demonstrate understanding of chemical reactions in context

Level 1 **Credits** 6 **Assessment** Internal

Subfield Science

Domain Science - Core

Status Approved **Status date** December 2023

Planned review date December 2028 **Date version published** December 2023

Purpose Statement

Students are able to demonstrate understanding of chemical reactions in context.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Demonstrate understanding of chemical reactions in context 	<ul style="list-style-type: none"> Explain chemical reactions in context 	<ul style="list-style-type: none"> Interpret chemical reactions in context

Explanatory Notes

- 1 *Demonstrate understanding of chemical reactions in context* involves:
- describing a range of chemical reaction types and predictable patterns in chemical reactions, using observations
 - describing the reactants and products in the chemical reactions, with reference to conservation of mass
 - linking each chemical reaction to a context, modelled using generic word equations.

Explain chemical reactions in context involves:

- explaining conservation of mass for the chemical reactions, modelled using chemical word equations
- linking each explanation to a context, by linking the products and reactants of each reaction to predictable patterns, and observations.

Interpret chemical reactions in context involves:

- justifying conservation of mass for the chemical reactions, modelled using balanced chemical equations
- linking each justification to a context, with reference to the chemical reactions, products, reactants, predictable patterns and observations.

2 For the purposes of this standard, *chemical reaction types* are limited to:

- neutralisation
- combustion
- precipitation
- combination
- decomposition.

3 For the purpose of this achievement standard, *context* is a situation and environment the chemical reaction is occurring in. A context can be natural or human-made.

Examples of a context include:

- bacterial acid decaying a tooth is neutralised with toothpaste (neutralisation)
- fuel in a burner producing sooty smoke when burning (combustion)
- phosphate chemicals in polluted waterways (precipitation)
- iron and oxygen degrading tools via rust (combination)
- carbonic acid in soft drinks reacting to produce fizzy carbon dioxide gas (decomposition).

4 For the purpose of this achievement standard, *observations* can be primary or secondary data.

5 For the purpose of this achievement standard, examples of *equations* include the following:

- generic word equations such as:
acid + base → salt + water
- chemical word equations such as:
hydrochloric acid + magnesium hydroxide → magnesium chloride + water
- balanced chemical equations such as:
 $2\text{HCl} + \text{Mg}(\text{OH})_2 \rightarrow \text{MgCl}_2 + 2\text{H}_2\text{O}$.

6 Refer to the NCEA [glossary](#) for Māori, Pacific, and further subject-specific terms and concepts.

7 This achievement standard is derived from the Science Learning Area at Level 6 of *The New Zealand Curriculum*: Learning Media, Ministry of Education, 2007.

Replacement Information

This achievement standard and AS92020, AS92022, and AS92023 replaced AS90925-AS90934.

Quality Assurance

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

Consent and Moderation Requirements (CMR) reference 0233
