Achievement Standard

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Subject Reference		Chemistry and Biology 1.2					
Title		Demonstra	te unders	tanding of che	emical reaction	is in context	
Level	1	Credits	6		Assessment	Internal	
Subfield	Science						
Domain	Science - Core						
Status		Approved		Status date		September 2024	
Planned review date		December 2028		Date version published		December 2024	

Purpose Statement

Students are able to demonstrate understanding of chemical reactions in contexts beyond the laboratory.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
 Demonstrate understanding of chemical reactions in context 	 Explain chemical reactions in context 	 Interpret chemical reactions in context

Explanatory Notes

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

Explain chemical reactions in context involves:

- explaining the relationship between the reactants and products for the range of chemical reactions using equations, with reference to conservation of mass
- explaining how each chemical reaction links to a context, using predictable patterns and observations.

Interpret chemical reactions in context involves:

- discussing the implications of conservation of mass in the context of each chemical reaction, with reference to predictable patterns, observations, and equations.
- 2 For the purpose of this achievement 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 beyond the laboratory. 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, *equations* include generic word equations, chemical word equations, and balanced chemical equations.

Examples include:

- acid + base -> salt + water
- hydrochloric acid + magnesium hydroxide -> magnesium chloride + water
- 2HCl + Mg(OH)₂ -> MgCl₂ + 2H₂O.
- 6 Refer to the NCEA <u>glossary</u> 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