Achievement Standard

Subject Reference	Science 3.4				
Title	Describe selected organic compounds and their uses				
Level	3	**Credits**	4	**Assessment**	External
Subfield	Science				
Domain	Science – Core				
Registration date	9 November 2005	**Date version published**	9 November 2005		

This achievement standard involves describing selected organic compounds and their uses.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Describe selected organic compounds and their uses.	• Explain selected organic compounds and their uses.	• Discuss selected organic compounds and their uses.

Explanatory Notes

1 This achievement standard is derived from *Science in the New Zealand Curriculum,* Learning Media, Ministry of Education, 1993, achievement objectives 2 and 4 of the Making Sense of the Material World strand, pp. 104–105. This achievement standard is also related to *Pūtaiao i roto i te Marautanga o Aotearoa*, Learning Media, Ministry of Education, 1996, Ō Kawekawe: Te Whē, pp. 68–69.

2 *Selected organic compounds* refers to the structure, and physical and chemical properties of alkanes, alkenes, alcohols, carboxylic acids, fats and oils within the limitations of Explanatory Notes 4 to 7.

3 *Uses* refers to uses and/or effects of organic compounds in household, health, environmental, and industrial contexts, within the limitations of Explanatory Notes 4 to 7.

4 Alkanes and alkenes
- limited to unbranched chains
- properties include solubility, melting and boiling point, and degree of saturation
- effect on properties of increasing carbon chain length
- reactions are limited to combustion, addition reactions with hydrogen, and the addition polymerisation of ethene
- uses could include fuels.

5 Alcohols
- limited to unbranched, primary alcohols
- properties include solubility, and melting and boiling points
- reactions are limited to complete oxidation of alcohols and esterification
- uses could include solvents and fuels.

6 Carboxylic acids
- limited to mono carboxylic acids
- properties include pH and solubility
- reactions are limited to esterification
- uses could include formation of esters including triglycerides.

7 Fats and oils
- properties include melting point, degree of saturation, and shape of molecules
- reactions will be limited to the tests for unsaturation using bromine or iodine
- effect on melting point of increasing fatty acid chain length, and degree of saturation
- uses could include: fats and oils as foods and their effect on human health considering the degree of saturation, and cis and trans structures; action of the soap and detergent anion on triglycerides and hydrocarbons.

8 Terms
- *Describe* requires the student to recognise, name, draw, give characteristics of or an account of.
- *Explain* requires the student to provide a reason as to how or why something occurs.
- *Discuss* requires the student to show understanding by linking scientific ideas. It may involve students in justifying, relating, evaluating, comparing and contrasting, analysing.

Quality Assurance

1 Providers and Industry Training Organisations must be accredited by the Qualifications Authority before they can register credits from assessment against achievement standards.

2 Accredited providers and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Accreditation and Moderation Action Plan (AMAP) reference 0226