

<b>Title</b>	<b>Demonstrate knowledge of the biochemistry of cells</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>5</b>

<b>Purpose</b>	People credited with this unit standard are able to outline: the structure and functions of carbohydrates, lipids, proteins, and nucleic acids; and the metabolic processes occurring in cells.
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<b>Classification</b>	Science > Biology
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<b>Available grade</b>	Achieved
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### Guidance Information

It is not expected that outlines will include molecular formulae or molecular structures.

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### Outcomes and performance criteria

#### Outcome 1

Outline the structure and functions of carbohydrates.

#### Performance criteria

- 1.1 Monosaccharides, disaccharides, and polysaccharides are outlined in terms of structure.
- 1.2 Carbohydrates are described in terms of their cellular function.
- Range monosaccharides, polysaccharides; evidence of four carbohydrates.

#### Outcome 2

Outline the structure and functions of lipids.

Range fatty acids, triglycerides, phospholipids, cholesterol.

#### Performance criteria

- 2.1 Lipid structure is outlined using simple diagrams.
- 2.2 Lipid structure is described in terms of function.

**Outcome 3**

Outline the structure and functions of proteins.

**Performance criteria**

- 3.1 An amino acid is drawn to outline its structure.
- 3.2 Protein structure is described in terms of levels of organisation.  
Range primary, secondary, tertiary, quaternary.
- 3.3 Proteins are outlined using examples of function.  
Range may include – structural, enzyme, transport, recognition, defence, hormone, storage.
- 3.4 Activity of enzymes is outlined in relation to factors affecting enzyme structure.  
Range may include – temperature, inhibitors, activators, substrate, pH.

**Outcome 4**

Outline the structure and functions of nucleic acids.

**Performance criteria**

- 4.1 Arrangement of deoxyribose, phosphate, and bases is outlined in relation to double stranded deoxyribonucleic acid (DNA).
- 4.2 Differences between ribonucleic acid (RNA) and DNA are outlined in terms of structure.
- 4.3 DNA replication is outlined in terms of structure.
- 4.4 Cellular transcription and translation are outlined using flow diagrams to illustrate the formation of proteins.  
Range DNA, rRNA, mRNA, tRNA.

**Outcome 5**

Outline the metabolic processes occurring in cells.

**Performance criteria**

- 5.1 Role of adenosine – 5'- triphosphate (ATP) is outlined in relation to energy pathways in cells.

5.2 Stages of photosynthesis are outlined using flow diagrams in relation to energy pathways.

Range light dependent reaction, light independent reaction.

5.3 Stages of aerobic respiration are outlined using flow diagrams in relation to energy pathways.

Range glycolysis, tricarboxylic acid cycle, electron transport chain.

<b>Replacement information</b>	This unit standard and unit standard 12812 replaced unit standard 8107.
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**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	24 February 1998	31 December 2014
Review	2	23 November 1999	31 December 2014
Review	3	21 May 2010	31 December 2022
Rollover	4	27 January 2015	31 December 2022
Rollover and Revision	5	15 June 2017	31 December 2022
Revision	6	26 October 2017	31 December 2022
Review	7	22 October 2020	31 December 2022

<b>Consent and Moderation Requirements (CMR) reference</b>	0113
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.