Title	**Demonstrate knowledge of the biochemistry of cells**		
Level	**4**	**Credits**	**5**

Purpose	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.

Classification	Science > Biology

Available grade	Achieved

Guidance Information

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

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.

Replacement information	This unit standard and unit standard 12812 replaced unit standard 8107.

Planned review date	31 December 2020

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	N/A
Rollover	4	27 January 2015	N/A
Rollover and Revision	5	15 June 2017	N/A
Revision	6	26 October 2017	N/A

Consent and Moderation Requirements (CMR) reference	0113

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

Comments on this unit standard

Please contact NZQA National Qualifications Services nqs@nzqa.govt.nz if you wish to suggest changes to the content of this unit standard.