

<b>Title</b>	<b>Discuss the cellular metabolism of glucose, amino acids, and fatty acids</b>		
<b>Level</b>	<b>6</b>	<b>Credits</b>	<b>6</b>

<b>Purpose</b>	People credited with this unit standard are able to: discuss the metabolism of glucose and amino acids; describe metabolism of fatty acids; and discuss the role of adenosine triphosphate (ATP) in metabolism.
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<b>Classification</b>	Science > Biochemistry
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<b>Available grade</b>	Achieved
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### Guidance Information

- 1 Glossary  
*Pathway* refers to a series of biochemical reactions occurring in cells. For example, glycolysis is a pathway in the respiration process.
- 2 Recommended for entry: Unit 26489, *Demonstrate knowledge of the structure and function of lipids*; and Unit 26490, *Demonstrate knowledge of the structure, properties, and functions of amino acids and proteins*.

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### Outcomes and performance criteria

#### Outcome 1

Discuss the metabolism of glucose.

#### Performance criteria

- 1.1 The metabolism of glucose is discussed in terms of relationships between pathways and cellular location.  
  
Range glycolysis, gluconeogenesis, Krebs cycle, electron transport chain, glycogen metabolism.
- 1.2 The fates of pyruvate are discussed in relation to fermentation products.

#### Outcome 2

Discuss the metabolism of amino acids.

**Performance criteria**

- 2.1 The general metabolic reactions of amino acids are discussed.  
Range amination, deamination, decarboxylation, transamination.
- 2.2 The fate of amino acids in the respiratory process is discussed.
- 2.3 Ketogenic and glucogenic amino acids are distinguished.
- 2.4 The processes for excretion of excess nitrogen in animals are discussed.

**Outcome 3**

Describe the metabolism of fatty acids.

**Performance criteria**

- 3.1 The pathways of fatty acid metabolism are described.  
Range  $\beta$ -oxidation, Krebs cycle, formation and function of ketone bodies.
- 3.2 Lipid biosynthetic pathways are described.  
Range two of – fatty acids, triacylglycerols, phospholipids.

**Outcome 4**

Discuss the role of adenosine triphosphate (ATP) in metabolism.

**Performance criteria**

- 4.1 The energetics (ATP yield) of the metabolism of glucose, amino acids, and fatty acids are compared.
- 4.2 The relationship and interconversion of ATP and adenosine diphosphate (ADP) are explained.  
Range cellular location, adenosine triphosphate synthase (ATPase), proton motive force.
- 4.3 The coupled nature of electron transport chain and oxidative phosphorylation is discussed.

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<b>Replacement information</b>	This unit standard replaced unit standard 8057.
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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	17 September 2010	31 December 2025
Rollover	2	27 January 2015	31 December 2025
Review	3	27 September 2018	31 December 2025
Review	4	30 November 2023	31 December 2025

**Consent and Moderation Requirements (CMR) reference**

0113

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