

National Diploma in Science (Technician) (Level 5) with optional strands in Laboratory Practice and Technology, Chemistry, Microbiology, and Applied

Level 5

Credits 120

This qualification has been **reviewed**. The last date to meet the requirements is 31 December 2018.

Transition Arrangements

This qualification has been reviewed and replaced by the New Zealand Diploma in Applied Science (Level 5) [Ref: 2552].

The last date for entry into programmes leading to this qualification is 31 December 2016.

The last date to meet the requirements of this qualification is 31 December 2018 at which point the qualification will be designated discontinued. From that date no results can be reported against the qualification.

For detailed information see [Review Summaries](#) on the NZQA website.

This qualification contained standards that had expired or been replaced by other standards. For the purposes of this qualification people who have gained credit for the expiring standard are exempt from the requirement to gain credit for the replacement standard – see table below.

Credit for	Exempt from
8435	26341, 26342
8045, 8047	26486

NZQF National Qualification Registration Information

Process	Version	Date	Last Date for Assessment
Registration	1	November 1996	December 2005
Revision	2	April 1998	December 2005
Review	3	September 1998	December 2005
Revision	4	July 2000	December 2005
Revision	5	February 2004	December 2007
Review	6	January 2005	December 2018
Review	7	June 2011	December 2018
Review	8	January 2015	December 2018

Standard Setting Body

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Reviewed

National Diploma in Science (Technician) (Level 5) with optional strands in Laboratory Practice and Technology, Chemistry, Microbiology, and Applied

Level 5

Credits 120

Purpose

The National Diploma in Science (Technician) (Level 5) with optional strands [Ref: 0234] recognises the skills and knowledge that are needed to gain employment where the application of specialised laboratory and fieldwork skills are required.

These skills include:

- using problem solving skills in a variety of routine situations
- demonstrating competence in technical written communications
- demonstrating practical competence of laboratory techniques
- accurately recording scientific results
- identifying and managing laboratory hazards
- working safely in a scientific environment or chemical and/or a microbiological laboratory.

The emphasis in this qualification is on practical and technical skills, and on technical expertise in the use of instruments and scientific methodology used in industry and research laboratories.

There are multiple paths in this qualification to achieve the required 120 credits.

- A general Science (Technician) qualification, where 120 credits are required, with 24 credits coming from the compulsory standards, and the remaining credits coming from the *Science* sub field, resulting in the National Diploma in Science (Technician) (Level 5) [Ref: 0234]; or
- A specialised Science (Technician) qualification, with 24 credits coming from the compulsory standards, and the remaining credits coming from the domains or list of standards appropriate to the strands, resulting in, for example, award of the National Diploma in Science (Technician) (Level 5) with optional strand Laboratory Practice and Technology [Ref: 0234].

The core compulsory standards ensure scientific knowledge is supported by knowledge of:

- safe working practices in chemical and microbiological laboratories
- laboratory quality management systems
- management of hazardous substances
- communication skills to write an analytical report.

The optional strands recognise the candidate's skills which may include:

- interpreting and reporting technical scientific results
- reporting results in a clear, timely, and applicable format for interpretation
- using communication skills to convey information and instructions.

The Laboratory Practice and Technology strand recognises laboratory practical skills from various science fields. The strand is designed to be flexible so that the provider can select practically assessed standards to recognise candidate's competence in the practical skills that are practised in real laboratory contexts.

The Microbiology and Chemistry strands recognise knowledge and skills in their respective fields. The strand is designed to be flexible so that the provider can select practically assessed standards in Microbiology, Immunology, Molecular – Biology and Science - Core or standards which assess knowledge in these domains. Similarly the Chemistry strand is designed to be flexible so that the provider can select practically assessed standards in Chemistry, Biochemistry and Science – Core or standards which assess knowledge in these domains.

The Applied optional strand includes the standard 26346, in Science – Core, that requires candidates to undertake practical work experience in a research or industrial laboratory and allows recognition of that experience. This is a standard that recognises a significant and specific outcome related to the application of the skills and techniques acquired in a teaching and learning environment. Candidates that have been recognised for this standard have shown the ability to work in an industrial or research laboratory and are able to apply scientific skills to execute a scientific process, record data and results from the performance of a scientific process, and write a scientific report based on the recorded data and results of the scientific process performed.

Technicians would be able to perform tasks as required by industrial and research laboratories; they would demonstrate competency in routine laboratory tasks as required by this scientific environment; and they would be able to use a range of relevant technical equipment and have the competence and ability to practice safe laboratory techniques.

This qualification builds on scientific skills and knowledge acquired from secondary school, the National Certificate in Science (Level 4) [Ref: 1669], the National Certificate in Science (Level 5) [Ref: 1670], or related qualifications. It can lead to the National Diploma in Science (Advanced Technician) (Level 6) with optional strands in Laboratory Practice and Technology, Chemistry, Microbiology, and Applied [Ref: 0235] or an equivalent qualification. It provides a sound platform for employment and/or further study towards higher specialist science qualifications and/or science qualifications related to the workplace or to university study.

Credit Range

	Core Compulsory	Core Elective	Balance
Level 4 credits	19	-	0-16
Level 5 credits	5	0-80	0-16
Level 6 or above credits	-	0-80	0-16
Minimum totals	24	80	-

Based on credits selected within the Core Elective candidates can be awarded one of the following optional strands in recognition of their specialisation in a particular area.

	Laboratory Practice and Technology Optional Strand		Chemistry Optional Strand	Microbiology Optional Strand
	Set A	Set B		
Level 4 credits	0-27	0-4	-	-
Level 5 or above credits	0-16	0-30	50	50
Minimum totals for strand	50		50	50

Based on selection of standard 26346 candidates can be awarded the Applied optional strand in recognition of their practical work experience in a research or industrial laboratory.

	Applied Optional Strand
Level 5	10
Minimum totals for strand	10

Requirements for Award of Qualification

Award of NZQF National Qualifications

Credit gained for a standard may be used only once to meet the requirements of this qualification.

Unit standards and achievement standards that are equivalent in outcome are mutually exclusive for the purpose of award. The table of mutually exclusive standards is provided on the New Zealand Qualifications Authority (NZQA) website: <http://www.nzqa.govt.nz/qualifications-standards/standards/standards-exclusion-list/>.

Reviewed standards that continue to recognise the same overall outcome are registered as new versions and retain their identification number (ID). Any version of a standard with the same ID may be used to meet qualification requirements that list the ID and/or that specify the past or current classification of the standard.

Summary of Requirements

- A minimum of 120 credits at Level 4 or above
- Core Compulsory standards
- Core Elective – A minimum of 80 credits as specified
- Balance – Balance if required

The following strands are optional

- Laboratory Practice and Technology Optional Strand
- Chemistry Optional Strand
- Microbiology Optional Strand
- Applied Optional Strand

Detailed Requirements

Core Compulsory

The following standards are required

Humanities > Communication Skills > Writing

ID	Title	Level	Credit
9685	Write an analytical report	5	5

Sciences > Science > Chemistry

ID	Title	Level	Credit
26341	Perform titrimetric analyses	4	6

Sciences > Science > Microbiology

ID	Title	Level	Credit
8040	Perform aseptic laboratory techniques	4	4

Sciences > Science > Science - Core

ID	Title	Level	Credit
8029	Work safely in a microbiological laboratory	4	2
8466	Demonstrate competent use of laboratory measurement and recording procedures	4	4
8467	Work safely in a chemical laboratory	4	3

Core Elective

A minimum of 80 credits at Level 5 or above

Field	Subfield	Domain
Sciences	Science	Any

Balance

The balance of credits to achieve

A minimum of 120 credits at Level 4 or above

May come from anywhere on the DAS

Laboratory Practice and Technology Optional Strand

A minimum of 50 credits

From the following sets

- Set A
- Set B

Set A

A maximum of 30 credits

Sciences > Science > Biochemistry

ID	Title	Level	Credit
8043	Perform spectrophotometric analyses	5	3
8044	Perform laboratory centrifugation techniques	4	1
26486	Perform paper, thin layer, and column chromatography	5	4

Sciences > Science > Chemistry

ID	Title	Level	Credit
8436	Demonstrate laboratory solvent and distillation separation techniques	4	5
8439	Perform titrations	5	5
8453	Perform qualitative anion and cation analysis	4	3
9242	Perform titrimetric analysis using colour indicators	4	5
12363	Demonstrate knowledge of chromatography systems	5	4
16566	Perform organic chemistry functional group analysis	4	5
26342	Perform gravimetric analyses	4	4

Sciences > Science > Science - Core

ID	Title	Level	Credit
8091	Use and maintain a light microscope	4	2
26344	Use a laboratory information management system	4	2

Set B

A maximum of 30 credits

Sciences > Science > Biology

ID	Title	Level	Credit
8097	Analyse field measurements of plants	5	4
8098	Analyse field measurements of animals	5	4
26420	Perform histological techniques	5	4

Sciences > Science > Microbiology

ID	Title	Level	Credit
8023	Demonstrate and apply knowledge of microorganism biochemical pathways	5	6
8033	Culture and identify fungi to division level	5	3
8035	Carry out visualisation and measurement of microorganisms	4	4
8037	Describe and identify major groups of protozoa	5	2
8038	Perform viable microbiological counting methods	5	3
8042	Apply principles of bacterial identification	5	6
26109	Culture microorganisms	5	4
26110	Control microbial growth	5	3

Sciences > Science > Molecular Biology

ID	Title	Level	Credit
8050	Perform electrophoresis	5	3

Chemistry Optional Strand

A minimum of 50 credits at Level 5 or above

Field	Subfield	Domain
Sciences	Science	Biochemistry
		Chemistry
		Science - Core

Microbiology Optional Strand

A minimum of 50 credits at Level 5 or above

Field	Subfield	Domain
Sciences	Science	Immunology
		Microbiology
		Molecular Biology
		Science - Core

Applied Optional Strand

The following standard is required

Sciences > Science > Science - Core

ID	Title	Level	Credit
26346	Write a scientific report based on results of a scientific process in an industrial or research laboratory	5	10

Transition Arrangements

Version 7

Version 7 was issued following review.

Changes to structure and content

- Overall credit value was reduced from 240 to 120.
- Credit value of the Core Compulsory section was increased from 4 to 24, and standards 8040, 8466, 9685, and 26341 were added to it.
- Standards 8029 and 8467 were moved from the old Core Elective to the Core Compulsory.
- The compulsory standard 8441 was removed from the qualification.
- The Science Elective was replaced with a new Core Elective which allows credits from the *Science* subfield.
- Optional strands were added in Laboratory Practice and Technology, Chemistry, Microbiology and Applied.
- The Mathematics, Communication, and Information Technology electives were removed from the qualification.

For detailed information see [Review Summaries](#) on the NZQA website.

Previous versions of the qualification

Version 6 was issued following a review of the qualification. The qualification was structured to include quality systems and safety standards as requirements in the qualification. Version 6 included credit exemptions on the basis of NZCS subject passes. These transition arrangements expired on 31 December 2005.

Version 5 was issued to introduce new transition and credit transfer arrangements.

Version 4 was issued to correct an error in the transition action plan and to take account of a review of Business Administration standards.

Version 3 was issued following a review of the qualification. The qualification was structured into four elective sets, and four additional standards and a subfield were included in the electives.

Certification

This certificate will display the logos of NZQA and the organisation that has been granted consent to assess against standards that meet the requirements of the qualification (accredited).

Classification

This qualification is classified according to the classification system listed on the Directory of Assessment Standards (DAS) and the New Zealand Standard Classification of Education (NZSCED) system as specified below.

DAS Classification		NZSCED	
Code	Description	Code	Description
316	Sciences > Science	019909	Natural and Physical Sciences > Other Natural and Physical Sciences > Laboratory Technology

Quality Management Systems

Providers and Industry Training Organisations must be granted consent to assess by a recognised Quality Assurance Body before they can register credits from assessment against standards. Organisation with consent to assess and Industry Training Organisations assessing against standards must engage with the moderation system that applies to those standards. Consent to assess requirements and the moderation system are outlined in the associated Consent and Moderation Requirements (CMR) for each standard.

Review