

**Laboratory Technicians Standards Draft
16 August 2011**

DRAFT

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Draft 2 Version 16 August 2011

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Acknowledgements:

This working party was formed at the National Forum on the Role and Support Structures for School Laboratory Technicians in Australian Secondary Schools held at the Mercure Hotel, Sydney Thursday 8 July 2010. A workshop for this working party was held at the Australian Science Teachers Associations (ASTA) Office in Canberra Saturday-Sunday 27/28 November 2010,

This forum and the workshop were funded by the Australian Government Department of Education, Employment and Workplace Relations.

The support of ASTA in arranging the forum and workshop is greatly appreciated.

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Comment [GF1]: Is the document set out in a clear and easy to use format?

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CONTEXT

"...mineral-rich Australia has a shortage of scientists and engineers".

Jacques Nasser, BHP Billiton Chairman; May 2011

Australia has a need for scientists and engineers as well as a scientifically literate society. In order to provide a world class curriculum and to meet these needs the Australian Curriculum, Assessment and Reporting Authority (ACARA) released the *Australian Curriculum: Science* in December 2010. This document is the first in a series designed to meet the needs of 21st century learners. Science Inquiry Skills is one of three equally valued strands and one of the stated aims of this curriculum is that students should develop:

"an understanding of the nature of scientific inquiry and the ability to use a range of scientific inquiry methods, including questioning; planning and conducting experiments and investigations based on ethical principles; collecting and analysing data; evaluating results; and drawing critical, evidence-based conclusions"(ACARA 2010)

It is vital for the delivery of practical, hands on, science education that teachers are well resourced. *"Science teachers depend heavily on good facilities and high quality technical support to implement an engaging and inquiry-oriented curriculum"*. (Hackling, 2009, 4)

School science technicians work alongside teachers supporting the delivery of practical and inquiry based science education. They provide advice and expertise regarding health and safety requirements, legislative compliance and manage the resources necessary for all science laboratory practical activities.

This focus on student initiated investigations and inquiry based learning will require increased levels of paraprofessional support for teachers of science particularly by school science technicians.

INTRODUCTION

Concerns about the status of technical support for science teaching programs in Australian schools expressed by the Australian Science Teachers Association (ASTA) and Science Education Technicians Australia (SETA) led to the Australian Government Department of Education, Employment and Workplace Relations (DEEWR) funding a study to investigate the training and support for technicians, their roles and the level of servicing provided by technicians for the teaching and learning of secondary science.

The research identified many issues in Australia's current systems including: inadequate service factors, training levels, career opportunities, and OHS risks. These concerns lead to the conclusion that the existing system is generally not well equipped to meet the new challenges of the implementation of the Australian Curriculum Science. (Hackling, 2009)

The report made 8 recommendations which address training programs aligned with the needs of the educational sector, minimum standards for training and induction into the role,

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consistent job specifications, availability and support for ongoing professional development, minimum standards for staffing levels defined by a technicians' service factor and the establishment of an online advisory service. (Hackling, 2009)

This Working Party was formed at the July 2010 National Forum and sought to set out a national template for the professional standards, career structures and consistent job specifications for School Science Technicians that will support the good teaching of Science in our schools, and facilitate the successful implementation of the Australian Curriculum: Science. (ASTA 2010)

This document addresses recommendations 2, 3 and 5 of the report and it is acknowledged that these should not be regarded in isolation but as part of a holistic approach to addressing the issues identified.

This document aims to describe:

- a) Minimum standards for the training required for employment of science technicians in secondary schools and for their induction into the role,
- b) A career structure that recognizes the development of skills and experience, and
- c) Nationally consistent job specifications for various levels of science technicians to which appropriate salary scales would be linked.
- d) Minimum standards for technician servicing of secondary science programs

In developing these draft Professional Standards the Working Party was intently aware of the particular challenges faced by a large number of rural and remote schools that exist in many parts of Australia. These schools experience significant problems in trying to deliver quality Science programs due to their size, geographical isolation, failure to attract qualified staff and lack of ongoing professional development. The Working Party deemed the implementation of the proposed National Advisory Online Service, recommendation 6 of the report, as being critical to the support and professional learning of technicians in these rural and remote schools.

The Working Party recognized that there are many existing highly competent school science technicians without formal qualifications who have developed their knowledge and skills through "on the job training". It is not the intent of this paper to suggest that these technicians need undertake retraining to continue working in these existing positions. It is however the intent of the document to ensure that technicians entering the profession in the future will have appropriate qualifications before entering the workplace or at a minimum are provided with appropriate training when taking up their position at the educational institution.

It is intended that these Standards, once accepted, will be used to inform all stakeholders including government Departments of Education, the Catholic and Non-Government sector employers, educational professional associations and their members, and relevant unions. It is further intended that the agreed Standards will be available to the professional associations to advocate for their adoption.

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PURPOSE

The Standards describe the role of technicians in the education sector and what is required of technicians at three levels of classification plus trainee:

- Science Assistant (Trainee).
- Science Technician
- Senior Science Technician
- Science Laboratory Manager

This classification system was developed after reviewing existing structures in jurisdictions and sectors from across the country. The Working Party noted significant variation between employers and attempted to identify a structure that would suit the professional needs of technicians, at the same time being easy to adopt by employers in all States and Territories.

This structure provides a career pathway for technicians and ensures that all who work and study in our schools are adequately supported and protected. The Standards require that employers ensure that all technicians will be appropriately trained to perform the duties that they have been employed to do. The structure has been designed to meet the needs of all jurisdictions and sectors across Australia with respect to

- OHS
- Legislative compliance
- Training
- Risk management.

By publicly articulating the role and minimum standards at each career level, the structure will encourage all technicians to engage in professional learning throughout their career. The career pathway defined in the document should allow practitioners to access high levels of job satisfaction and improve the status of technicians within the broader education community.

This Standards document should also encourage employers to provide ongoing professional learning opportunities for all technicians. This ongoing support is seen as essential to ensuring high quality technical support for teachers in their attempt to develop engaging, enquiry based learning experiences.

The Standards will provide a common language for professional dialogue between technicians, science educators, professional associations, employers, unions and the public. It makes explicit the knowledge, skills, and practice for technicians to play an effective role in the education of students. The Standards should reflect the current and growing expertise, career aspirations and achievements of all school science technicians.

The Standards provide a research based, national approach to recognising technicians' skills and expertise. They should also provide a transparent mechanism for accrediting them at appropriate stages of their career. It is expected that suitable levels of remuneration will be linked to these standards and provide portable certification and greater mobility.

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SERVICE FACTOR

This document details the knowledge, skills, and practice for technicians to play an effective role in the education of students. However in order to to perform all of the required tasks, it is critical to have adequate time to do so. The ASE (The Royal Society & ASE, 2001) developed a service factor and described the standard of service that would be provided for different levels of service factor (See appendix 2). The service factor is calculated as follows:

$$\text{Service Factor} = \frac{\text{Technician hours per week}}{\text{Hours of science teaching per week}}$$

Technician hours per week are the sum of hours of employment in one week of all technicians working at that school during term time. The hours of science teaching per week is the sum of hours of science teaching per week for all secondary classes at that school

The Report recommended that the service factor in Australian schools be set at a minimum of at least 0.6.

INDUCTION INTO THE ROLE

Prior to commencing work a site specific induction is mandatory. Also due to the wide range of hazardous substances maintained in the school science chemical store, it is essential that relevant training is provided regarding the types of hazardous substances and the correct handling procedures including the use of personal protective equipment to minimise the risk to the person's safety and health.

These standards describe best practice and it is acknowledged that rural and remote schools face challenges in attracting qualified staff. If schools in these situations employ a level 1 Science Assistant (Trainee) or a level 2 Science Technician, in the absence of level 3 Senior Science technician or a Level 4 Science Laboratory Manager, it is essential that these staff are supervised by competent and trained staff, and are provided with opportunities to access relevant training in order to maintain their personal safety and to develop skills necessary to support the teaching of science. It is essential that they have ready access to reliable and correct source(s) of advice on procedural issues.

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ORGANISATION OF STANDARDS

The Standards have been aligned with the ASTA National Professional Standards for Highly Accomplished Teachers of Science. (ASTA, 2002) They therefore also align with recent Professional Standards for Teachers published by the Australian Institute of Teaching and School Leadership (AITSL, 2011).

The Standards are organised into three Domains

- **Professional Knowledge**
- **Professional Practice**
- **Professional Attributes**

Within the Domains, standards identify the main components of what technicians should know and be able to do. Descriptors provide an indication of how the standards will apply at each level of capability.

School Science Technician Professional Standards

DOMAINS		
PROFESSIONAL KNOWLEDGE	PROFESSIONAL PRACTICE	PROFESSIONAL ATTRIBUTES
STANDARDS		
1. Relevant scientific concepts.	6. Delivery of the practical aspects of the Science Curriculum.	11. Demonstrate effective communication and interpersonal skills.
2. Content of Australian Curriculum: Science.	7. Create and maintain safe, efficient and supportive science teaching environments.	12. Work collegially within their school community and wider professional communities.
3. Technical knowledge.	8. Sound laboratory techniques.	13. Engage in relevant ongoing professional learning and reflection.
4. Legislative requirements and safe practice.	9. Facilitate maintenance and repair of the equipment.	
5. Administrative Practice.	10. Administrative management of the school Science Department	
DESCRIPTORS		
Refer to Standards at each level of proficiency		

(Table 1: Organisation of the School Science Technician Professional Standards)

Comment [GF2]: Do the 13 Standards, as listed in Table 1 on page 7, adequately capture all aspects of the role?

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DOMAINS OF LABORATORY PRACTICE

To be effective members of the faculty, who can impact both directly and indirectly on the quality of student learning, school science technicians must be able to work in all three domains.

Domain 1: Professional Knowledge

Technicians should have a fundamental understanding of the basic scientific concepts being taught in schools and be familiar with the content of the Australian Curriculum: Science. Without this body of knowledge they will not be able to provide effective support for the teachers. To perform their duties effectively technicians should have a highly developed knowledge of the techniques and processes needed to operate within a laboratory setting. An essential part of the specialist knowledge technicians require is a thorough understanding of legislative requirements by which activities in schools are bound. They should have knowledge of administration systems necessary for managing the faculty's resources.

Domain 2: Professional Practice

The demands placed on technicians are varied and require high levels of skill development. Technicians should be able to apply their knowledge in a practical way to a wide range of situations that arise within the faculty. They should possess a sound repertoire of laboratory techniques which they use to create and maintain safe working environments. Technicians should be able to provide practical and technical support to teachers so that they in turn can provide sound educational experiences to effect high level learning outcomes for all students. They must ensure that all equipment and resources provided to teachers are maintained to the highest standard and are appropriate to the learning outcome. Technicians must be able to provide expert technical advice to teachers and effectively manage all the resources of the science department.

Domain 3: Professional Attributes

Technicians must be effective communicators and should continuously reflect on, evaluate, improve and share their professional knowledge and practice. They should engage in professional learning both individually and collegially to enhance their knowledge and practice. As members of the Science faculty technicians must engage with suppliers in the identification, recommendation and purchase of appropriate resources and equipment. As members of the wider school community, technicians must also engage with other professional officers within the school in a manner that supports the wellbeing of all staff.

STANDARDS

The standards identify what technicians should know and be able to do. Technicians should use the standards as a guide to inform their professional development as they attempt to move along this career path.

DESCRIPTORS

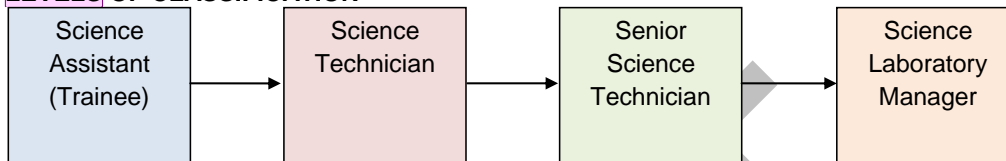
Descriptors are a statement of the identified components of each standard. Together they describe how technicians can demonstrate each standard. They outline the professional actions technicians engage in as they apply their professional knowledge, skills and attributes to their specific contexts.

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LEVELS OF CLASSIFICATION

This document sets out a 3 tier structure plus Trainee level, to establish a career structure for school science technicians and a workable model that can accommodate the range of schools, from small remote schools to large urban schools. They also provide a continuum of professional expertise throughout the technician's career.

LEVELS OF CLASSIFICATION



Level 1: Science Assistant (trainee)

This is the minimum entry level for someone coming into the profession. It is intended to be a training position and therefore of a short term nature only. It could include work placement students from tertiary institutions. When all training has been successfully completed the trainee must immediately be re-classified as a School Science Technician

As this is an entry level position, employees working as a Science Assistant must work under the supervision of a qualified Science Technician, Senior Science Technician or Science Laboratory Manager.

A School Science Assistant position should only be created for the purpose of training a person to continue in laboratory work and it would be expected that a training plan would be in place for the duration of such a position. Personnel working at this level should be undertaking a Certificate II III or IV¹ in Laboratory Skills or related course.

There are no requirements for qualifications at this level apart from those required by the institution providing the training.

Level 2: Science Technician

This is lowest level of classification for qualified Science Technicians in schools. Technicians working at this level will have completed entry level training and be expected to demonstrate a degree of autonomy in carrying out their duties.

This position does not require constant supervision and what supervision is required should be provided by a Senior Science Technician or Science Laboratory Manager. This should not be the position of a sole technician in a school as some of the duties and responsibilities would be beyond reasonable expectations for this level².

¹There is a divergence of opinion in the working party regarding the appropriate levels of certification

²There is a divergence of opinion in the working party regarding the inclusion of an exception due to small schools

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Comment [GF3]: Are the four levels of job classification appropriate?

Comment [GF4]: Are the qualifications for entry into each level of classification clear and easy to apply?

In situations where the Science Technician is the sole technician in the school, supervision and advice should be made available by the employer through:

- Access to Science Technician networks and the proposed National Online Advisory Service
- Mechanisms made available to allow the officer to undertake professional learning to progress to Senior Science Technician level.

A Science Technician would be expected to have completed a minimum of Certificate II and be working towards a Certificate III or IV¹ in Laboratory Skills or related course, or have equivalent other training or experience.

Level 3: Senior Science Technician

The position of Senior Science Technician involves the coordination of the laboratory aspects of the work of the science department and requires significant expertise and qualifications/experience. The Senior Science Technician is expected to work autonomously and may be responsible for the supervision of trainees and less experienced technicians.

The Senior Science Technician is the minimum employment level for a sole technician in any school².

The Senior Science Technician may be responsible for administering the Science Department budget.

A Senior Science Technician would be expected to have a Diploma of Applied Science or equivalent or Certificate IV (or equivalent) in Laboratory Skills or related course, with significant experience or extensive relevant experience in a related field.

Level 4: Science Laboratory Manager

Science Laboratory Managers are responsible for managing the efficient operation of the science laboratory area, and the implementation of strategies to assist the delivery of key school objectives. They receive limited direction and instructions, and are expected to work with a high degree of autonomy.

Science Laboratory Managers may have responsibility for supervising and directing the work of technicians and assistants (if any are employed). They may also be responsible for the development of policies and procedures to be used within the laboratories.

A Science Laboratory Manager would be expected to hold at least a Diploma of Applied Science or equivalent or extensive relevant experience in laboratory work in an educational setting.

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Descriptors of the Standards

DOMAIN 1: PROFESSIONAL KNOWLEDGE

1. Scientific concepts.

Descriptor	Science Assistant (Trainee)	Science Technician	Senior Science Technician	Science Laboratory Manager
1.1 Physical Sciences	<p>Develops a fundamental understanding of the concepts of</p> <ul style="list-style-type: none"> forces and laws of motion gravity magnetism and electricity; light and sound waves energy transformation and conservation, heat to a Year 10 level 	<p>Has a fundamental understanding of the concepts of</p> <ul style="list-style-type: none"> forces and laws of motion gravity magnetism, electricity and electronics; light, sound and radio waves energy transformation and conservation, heat lasers and radiation nuclear energy to a Year 12 level, and as they apply to the relevant Senior Science courses in Physical Sciences 	<p>Has a good understanding of the concepts of</p> <ul style="list-style-type: none"> forces and laws of motion gravity magnetism, electricity and electronics; light, sound and radio waves energy transformation and conservation, heat lasers and radiation nuclear energy to a Year 12 level, and as they apply to the relevant Senior Science courses in Physical Sciences 	<p>Has a thorough understanding of the concepts of</p> <ul style="list-style-type: none"> forces and laws of motion gravity magnetism, electricity and electronics; light, sound and radio waves energy transformation and conservation, heat lasers and radiation nuclear energy to a Year 12 level, and as they apply to the relevant Senior Science courses in Physical Sciences
1.2 Chemical Sciences	<p>Develops a fundamental understanding of the concepts of</p> <ul style="list-style-type: none"> states of matter elements, compounds and mixtures, separation of mixtures the structure of atoms chemical reactions and energy transfer rates of chemical reactions Periodic Table to a Year 10 level 	<p>Has a fundamental understanding of the concepts of</p> <ul style="list-style-type: none"> states of matter elements, compounds and mixtures, separation of mixtures the structure of atoms and molecules chemical reactions, titrations, energy transfer, rates of reactions Periodic Table electrochemistry organic chemistry analytical techniques to a Year 12 level, and as they apply to the relevant Senior 	<p>Has a good understanding of the concepts of</p> <ul style="list-style-type: none"> states of matter elements, compounds and mixtures, separation of mixtures the structure of atoms and molecules chemical reactions, titrations, energy transfer, rates of reactions Periodic Table electrochemistry organic chemistry analytical techniques to a Year 12 level, and as they apply to the relevant Senior 	<p>Has a thorough understanding of the concepts of</p> <ul style="list-style-type: none"> states of matter elements, compounds and mixtures, separation of mixtures the structure of atoms and molecules chemical reactions, titrations, energy transfer, rates of reactions Periodic Table electrochemistry organic chemistry analytical techniques to a Year 12 level, and as they apply to the relevant Senior

Comment [GF5]: Do the descriptors contained within this Standard adequately cover all aspects of the Standard?
Do the descriptors demonstrate an appropriate developmental sequence across the 4 levels of classification?

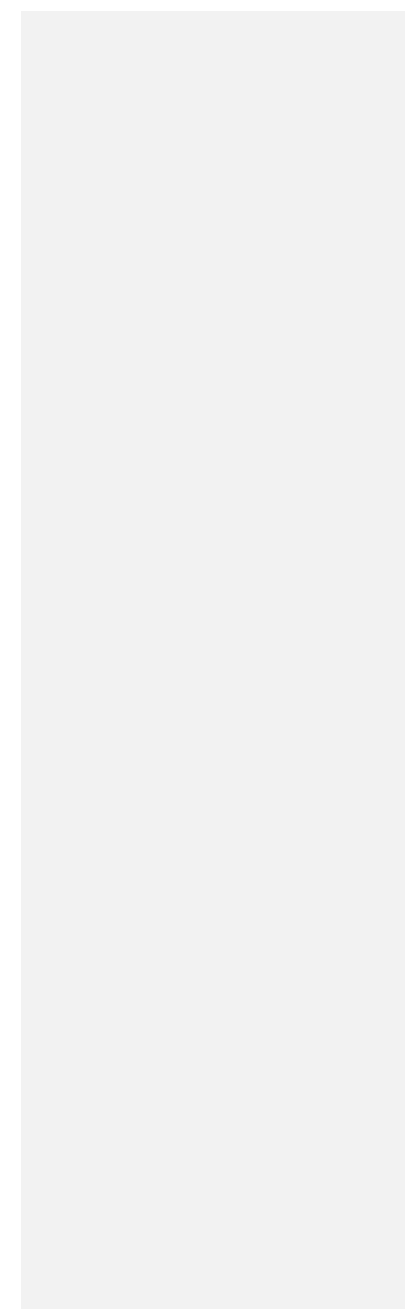
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		Science courses in the Chemical Sciences	Science courses in the Chemical Sciences	Science courses in the Chemical Sciences
1.3 Biological Sciences	Develops a fundamental understanding of the concepts of <ul style="list-style-type: none"> • classification of plants and animals • structure, function and behaviour of cells, cells, organs and organisms • reproduction and genetics • the theory of evolution • body systems • food chains and webs • ecosystems, matter and energy flow through systems to a Year 10 level 	Has a fundamental understanding of the concepts of <ul style="list-style-type: none"> • classification of plants and animals • structure, function and behaviour of cells, cells, organs and organisms • reproduction and genetics • the theory of evolution and natural selection • body systems and homeostasis • food webs, ecosystems and biodiversity, matter and energy flow to a Year 12 level, and as they apply to the relevant Senior Secondary courses in the Biological Sciences	Has a good understanding of the concepts of <ul style="list-style-type: none"> • classification of plants and animals • structure, function and behaviour of cells, cells, organs and organisms • reproduction and genetics • the theory of evolution and natural selection • body systems and homeostasis • food webs, ecosystems and biodiversity, matter and energy flow to a Year 12 level, and as they apply to the relevant Senior Secondary courses in the Biological Sciences	Has a thorough understanding of the concepts of <ul style="list-style-type: none"> • classification of plants and animals • structure, function and behaviour of cells, cells, organs and organisms • reproduction and genetics • the theory of evolution and natural selection • body systems and homeostasis • food webs, ecosystems and biodiversity, matter and energy flow to a Year 12 level, and as they apply to the relevant Senior Secondary courses in the Biological Sciences
1.4 Earth, Environment and Space Sciences	Develops a fundamental understanding of the concepts of <ul style="list-style-type: none"> • sedimentary, igneous and metamorphic rocks and processes • Minerals, properties and formation • plate tectonics • geological time scale, fossils and evolution • ecosystems and sustainability • renewable and non-renewable resources <ul style="list-style-type: none"> • water and the water cycle • carbon cycle 	Has a fundamental understanding of the concepts of <ul style="list-style-type: none"> • sedimentary, igneous and metamorphic rocks and processes • Minerals, properties and formation • plate tectonics • geological time scale, fossils and evolution • ecosystems and sustainability • renewable and non-renewable resources • global environmental conditions and human impact • water and the water cycle • carbon cycle 	Has a good understanding of the concepts of <ul style="list-style-type: none"> • sedimentary, igneous and metamorphic rocks and processes • Minerals, properties and formation • plate tectonics • geological time scale, fossils and evolution • ecosystems and sustainability • renewable and non-renewable resources • global environmental conditions and human impact • water and the water cycle • carbon cycle 	Has a thorough understanding of the concepts of <ul style="list-style-type: none"> • sedimentary, igneous and metamorphic rocks and processes • Minerals, properties and formation • plate tectonics • geological time scale, fossils and evolution • ecosystems and sustainability • renewable and non-renewable resources • global environmental conditions and human impact • water and the water cycle • carbon cycle

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	<ul style="list-style-type: none"> • the solar system, seasons and eclipses • the big bang theory to a Year 10 level 	<ul style="list-style-type: none"> • the solar system, seasons and eclipses • the big bang theory to a Year 12 level, and as they apply to the relevant Senior Secondary courses in Earth, Environmental and Space Science courses 	<ul style="list-style-type: none"> • the solar system, seasons and eclipses • the big bang theory to a Year 12 level, and as they apply to the relevant Senior Secondary courses in Earth, Environmental and Space Science courses 	<ul style="list-style-type: none"> • the solar system, seasons and eclipses • the big bang theory to a Year 12 level, and as they apply to the relevant Senior Secondary courses in Earth, Environmental and Space Science courses
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2. Content of the Australian Curriculum: Science

Descriptor	Science Assistant (Trainee)	Science Technician	Senior Science Technician	Science Laboratory Manager
2.1 Science Understanding	<p>Develops an awareness of the four F- 10 science sub strands:</p> <ul style="list-style-type: none"> • Biological sciences • Chemical sciences • Earth and Space sciences • Physical sciences <p>as well as the required Senior Secondary subjects</p>	<p>Able to access and understand the key principles of the four science sub strands:</p> <ul style="list-style-type: none"> • Biological sciences • Chemical sciences • Earth and Space sciences • Physical sciences <p>as well as the required Senior Secondary subjects</p>	<p>Able to access and understand the content of the four science sub strands:</p> <ul style="list-style-type: none"> • Biological sciences • Chemical sciences • Earth and Space sciences • Physical sciences <p>as well as the required Senior Secondary subjects</p>	<p>Able to access and understand the content of the four science sub strands:</p> <ul style="list-style-type: none"> • Biological sciences • Chemical sciences • Earth and Space sciences • Physical sciences <p>as well as the required Senior Secondary subjects</p>
2.2 Science as a Human Endeavour	<p>Develops an awareness of the two sub strands:</p> <ul style="list-style-type: none"> • Nature and development of science • Use and influence of science 	<p>Able to access and understand the key principles of the two sub strands:</p> <ul style="list-style-type: none"> • Nature and development of science • Use and influence of science 	<p>Able to access and understand the content of the two sub strands:</p> <ul style="list-style-type: none"> • Nature and development of science • Use and influence of science 	<p>Able to access and understand the content of the two sub strands:</p> <ul style="list-style-type: none"> • Nature and development of science • Use and influence of science
2.3 Science Inquiry Skills	<p>Develops an awareness of the five sub strands:</p> <ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analysing data and information • Evaluating • Communicating 	<p>Able to access and understand key principles of the five sub strands:</p> <ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analysing data and information • Evaluating • Communicating 	<p>Able to access and understand the content of the five sub strands:</p> <ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analysing data • Evaluating • Communicating 	<p>Able to access and understand the content of the five sub strands:</p> <ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analysing data • Evaluating • Communicating

Comment [GF6]: Do the descriptors contained within this Standard adequately cover all aspects of the Standard?
Do the descriptors demonstrate an appropriate developmental sequence across the 4 levels of classification?

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3. Technical knowledge.

Descriptor	Science Assistant (Trainee)	Science Technician	Senior Science Technician	Science Laboratory Manager
3.1 Technical knowledge in the Physical Sciences	<p>Develops knowledge of the use of equipment to take measurements.</p> <p>Learns how to process and present data</p> <p>Learns the names of physics equipment used in the laboratory</p>	<p>Knows how to use equipment to take measurements.</p> <p>Knows how to process and present data</p> <p>Knows how to perform standard calibrations</p> <p>Knows the areas of the curriculum in which physics equipment may be used</p>	<p>Maintains up to date knowledge on the use of equipment to take measurements</p> <p>Knows how to interpret data.</p> <p>Knows how to set up physics equipment for use in the laboratory</p>	<p>Knows how to train others to use equipment to take measurements.</p> <p>Supervises others when collating, presenting and interpreting data.</p> <p>Has detailed knowledge of how to set up and use physics equipment in the laboratory and may recommend alternative uses and/or equipment</p>
3.2 Technical knowledge in the Chemical Sciences	<p>Learns environmentally sustainable work practices</p> <p>Understands the need to follow directions for the preparation of working solutions</p> <p>Develops knowledge of a range of simple chemical testing procedures</p> <p>Learns the names of chemistry equipment used in the laboratory</p>	<p>Knows environmentally sustainable work practices</p> <p>Understands the calculations needed to prepare solutions</p> <p>Knows a range of simple chemical testing procedures</p> <p>Knows the areas of the curriculum that chemistry equipment may be used in</p>	<p>Knows how to implement and monitor environmentally sustainable work practices</p> <p>Understands the calculations needed and knows how to prepare and standardise solutions</p> <p>Knows how to prepare and use equipment to be used in chemical analysis</p> <p>Knows how to set up chemistry equipment for use in the laboratory</p>	<p>Knows how to plan, implement and monitor environmentally sustainable work practices</p> <p>Knows how to plan procedures and train others to perform calculations, prepare and standardise solutions</p> <p>Knows how to and trains others to conduct a range of chemical analysis procedures.</p> <p>Has detailed knowledge of how to set up and use chemistry equipment in the laboratory and may recommend alternative uses and/or equipment</p>
3.3 Technical knowledge in the Biological Sciences	<p>Develops a sound understanding of safe work practices to follow in the laboratory and the field</p>	<p>Knows safe work practices to follow in the laboratory and the field</p>	<p>Knows safe work practices to follow in the laboratory and the field</p>	<p>Knows safe work practices to follow in the laboratory and the field and how to teach others safe work practices</p>

Comment [GF7]: Do the descriptors contained within this Standard adequately cover all aspects of the Standard?
Do the descriptors demonstrate an appropriate developmental sequence across the 4 levels of classification?

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Learns how to prepare a variety of different culturing media	Knows how to make different culturing media	Knows the appropriate media to use for a variety of different of different investigations and is able to prepare them	Has a sound knowledge of a range of different media and their uses and is able to train others in their preparation and use
Learns aseptic techniques for use in the laboratory	Knows aseptic techniques for use in the laboratory	Knows and plans aseptic procedures for use in the laboratory	Is able to plan and teacher others aseptic procedures for use in the laboratory
Learns how to safely handle tissues and cell cultures in the laboratory	Knows how to care for and handle tissues and cell cultures in the laboratory	Knows how to prepare, care for and handle tissues and cell cultures in the laboratory	Knows and trains others how to prepare, care for and handle tissues and cell cultures in the laboratory
Learns how to prepare simple specimens for microscopic examinations	Knows how to prepare simple specimens for microscopic examination	Knows how to stain and prepare specimens for microscopic examination	Knows how to identify the appropriate procedures for preparing specimens for microscopic examination
Learns how to examine specimens using monocular and binocular microscopes	Knows how to examine specimens using both monocular and binocular microscopes	Knows how to use and maintain both monocular and binocular microscopes	Understands the requirements for microscopes and is able to research and select equipment appropriate to the school environment
Learns how to prepare specimens to be used for dissections	Knows how to prepare and clean specimens and equipment to be used for dissections	Knows how to prepare and clean specimens and equipment to be used for dissections	Has an in-depth knowledge of the preparation of specimens, preparation and cleaning of equipment to be used for biological dissections and how to train others
Learns the names, correct use of and appropriate cleaning methods for equipment used for dissections	Knows how to dissect a some biological specimens	Knows how to dissect a large variety of biological specimens	Knows how to train others to dissect in appropriate biological dissection techniques

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	<p>Learns simple sampling techniques for use in the field</p> <p>Learns basic conservation principles and practices to apply during fieldwork</p>	<p>Knows sampling techniques for use in fieldwork</p> <p>Knows how to make observations and take measurements in the field without causing damage to the environment</p>	<p>Knows how to conduct sampling techniques in the field and knows how to select appropriate equipment</p> <p>Has a sound knowledge of conservation principles and practices and how to work in the field without causing damage to the environment</p>	<p>Knows how to train others in use of a range of field sampling techniques and the preparation of equipment needed for each</p> <p>Knows how to teach others about conservation and techniques to use in the field which avoid damage to the environment</p>
<p>3.4 Technical knowledge in the Earth, Space and Environmental Sciences</p>	<p>Learns the physical and chemical features of basic minerals and rock types</p> <p>Learns how to make models to demonstrate geological features and other scientific concepts</p> <p>Learns about earth systems and processes and their changes over geological time</p> <p>Learns about the nature of ecosystems, their changes over time, and their sustainability</p>	<p>Knows the physical and chemical features of basic minerals and rock types</p> <p>Knows how to make simple models to demonstrate geological features and other scientific concepts</p> <p>Understands the key principles of earth systems and processes and their changes over geological time.</p> <p>Understands the principles of ecosystems, their changes over time, and their sustainability</p>	<p>Has an in depth knowledge of the classification of basic minerals and rock types</p> <p>Knows how to design and make models to demonstrate geological features and other scientific concepts</p> <p>Has in depth knowledge of the content of earth systems and processes and their changes over geological time</p> <p>Has in depth knowledge of the principles of ecosystems, their changes over time, and their sustainability</p>	<p>Has an in depth knowledge of the classification of a variety of rock types and can teach this to other people</p> <p>Knows how to assist other to design and make models to demonstrate geological features and other scientific concepts</p>
<p>3.5 Technical knowledge in the other areas including ICT & AV</p>	<p>Develops knowledge of how instruments operate and how to clean them</p> <p>Develops knowledge of how to calibrate equipment</p>	<p>Knows how to operate and clean instruments</p> <p>Knows how to calibrate equipment</p>	<p>Knows how to operate and clean instruments</p> <p>Knows how to calibrate a wide variety of laboratory equipment</p>	<p>Knows how to train others to maintain instruments</p> <p>Knows how to train others how to calibrate a wide variety of laboratory equipment</p>

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Develops the knowledge of simple glass manipulation	Knows how to manipulate glass in its various forms	Knows how to manipulate glass in its various forms	Knows how to train others in working with glass
Develops the ability to solder for minor repairs	Knows how to make minor repairs and solder	Knows how to make minor low voltage electrical repairs, soldering and manipulating electronic components	Knows how to train others in low voltage electrical repairs and soldering
Develops a knowledge of the basic computer software needed to work in the laboratory and field	Knows how to operate the basic software to work effectively in the laboratory and field	Has a sound knowledge of a range of software to work efficiently in the laboratory and field	Trains others to improve efficiency in the laboratory and field
Learns how to operate AV equipment in the laboratory and classroom	Knows how to operate basic AV equipment in the laboratory and classroom	Knows how to efficiently operate a wide range of AV equipment in the laboratory and classroom	Knows how to train others to operate and identify problems in the operation of AV equipment in the laboratory and the classroom

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4. Legislative requirements and safe practice. (See appendix for details)

Descriptor	Science Assistant (Trainee)	Science Technician	Senior Science Technician	Science Laboratory Manager
4.1 OHS Acts, Regulations, Codes of Practice, Stds	Obtain knowledge of OHS Acts, Regulations and Codes of Practice. Awareness of the school's OHS policies and procedures	Familiar with OHS legislation, Regulations and Codes of Practice. Develop an understanding of the school's OHS policies and procedures	Thorough knowledge of OHS legislation, Regulations and Codes of Practice, and of the school's OHS policies and procedures	Detailed understanding of school's processes for the development of OHS policies and procedures
4.2 Risk Assessment and Hazard Management	Develops an understanding of the risk control measures necessary to minimise hazards in the workplace	Understanding of hazard identification and risk assessments procedures	Knowledge of risk assessment and hazard control measures used in the science laboratories	Detailed knowledge of laboratory safety audits and risk assessments procedures in the school
4.3 Chemical Safety in Science	Develops a working knowledge of safe handling, storage and disposal procedures for hazardous substances	Understanding of relevant documents (e.g.SDS), their location and the correct procedures for the safe handling of chemicals.	Awareness of risk assessment procedures for hazardous substances. Familiar with correct storage, use and dispose of chemicals	Understands the legislative requirements for risk assessments, a chemical register, correct storage system and disposal of chemicals
4.4 Animal Care & Ethics	Learns appropriate procedures for the ethical use and care of animals in a school laboratory	Knowledge of appropriate procedures for the ethical use and care of animals in a school laboratory	Knowledge of appropriate procedures for the ethical care and use of animals in the school environment	Understands how to develop procedures for the ethical use and care of animals. Aware of relevant government bodies and other organisations regarding the care and use of animals
4.5 Biological Safety	Acquires knowledge of safe work practices to minimise the risk from biological hazards	Familiar with appropriate procedures to control risks from biological hazards	Knowledge of risk assessments for the control of biological hazards	Identify procedures for the safe handling, storage and disposal of biologically hazardous materials
4.6 Licensing Requirements (e.g. radiation, animal ethics, flora and fauna licences)	Aware of the need for licensing	Familiar with the licensing requirements	Knowledge of licensing requirements	Identify appropriate licensing requirements

Comment [GF8]: Do the descriptors contained within this Standard adequately cover all aspects of the Standard?
Do the descriptors demonstrate an appropriate developmental sequence across the 4 levels of classification?

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5. Administrative knowledge.

Descriptor	Science Assistant (Trainee)	Science Technician	Senior Science Technician	Science Laboratory Manager
5.1 Stock Control	<p>Learns how to correctly store the different types of materials and equipment used on site</p> <p>Learns the processes involved in stocktaking and record keeping to manage the different types of materials and equipment used on site</p> <p>With guidance learns what disposables and equipment are needed on site.</p>	<p>Knows how to correctly store the different types of materials and equipment used on site</p> <p>Understands the processes used in stocktaking and record keeping to manage the different types of materials and equipment used on site</p> <p>Has a basic understanding of what disposables and equipment are needed on site</p>	<p>Has a thorough knowledge of the correct storage of the different types of materials and equipment used on site</p> <p>Has a thorough knowledge of the processes used in stocktaking and record keeping to manage stock and knows to recommend changes to the processes used on site</p> <p>Has a thorough understanding of what disposables and equipment are needed and knows how to recommend new equipment to be purchased</p>	<p>Knows how to develop policies and procedures to manage the storage of disposables and equipment used on site and knows how to train others in these procedures</p> <p>Knows how to develop policies and procedures to manage stocktaking and record keeping on site and knows how to train others in these procedures</p> <p>Has a thorough understanding of what disposables and equipment are needed on site and knows how to select new or alternative equipment</p>
5.2 Purchasing Procedures for the Site	Develop an understanding of the correct procedures to follow when ordering disposables and new equipment	Knows the correct procedures for ordering disposables and other equipment needed by the faculty	Knows the correct procedures for ordering disposables and other equipment needed and how to make recommendations about future or alternate stock	Knows how to work with other site managers to develop policies and procedure to be followed when purchasing materials and knows how to train others
5.3 Management of Budgets	With assistance learns the processes used on site to account for: money coming into the faculty, outgoings and petty cash	Knows the appropriate processes used within the faculty to account for: money coming into the faculty, outgoings and petty cash	Has a thorough knowledge of the appropriate processes used within the faculty to account for: money coming into the faculty, outgoings and petty cash. Knows how to apply for future or special funding	Has a thorough knowledge of how to manage budgets and how to develop the necessary policies and procedures used to account for the funds. Knows how to train personnel in these accounting procedures
5.4 Personnel Management	Learns appropriate social guidelines for working with other people in a professional workplace	Knows how to develop and maintain professional working relationships with other school personnel	Knows how to develop and maintain professional working relationships with other school personnel. Knows how to deal with difficult staff and resolve disputes	Understands how to managing personnel. Knows the processes used in advertising for, interviewing and selecting new staff

Comment [GF9]: Do the descriptors contained within this Standard adequately cover all aspects of the Standard?
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5.5 Resource Management	With guidance learns the processes used to produce, store and share resource used on site	Demonstrates a sound knowledge of the processes used to produce, store and share resource used on site	Demonstrates a sound knowledge of the processes used to manage the faculty's resource collection. Knows how to design and produce special resources requested by teachers	Has a thorough understanding of how to manage the faculty's resource collection, design and produce resources requested by teachers and develop policies and procedures for the use of resources. Knows the requirements of the curriculum and may select new resources to add to the collection
5.6 Timetabling	Learn how to read and manage faculty timetables	Demonstrates a sound knowledge and understanding of the operation of faculty timetables	Demonstrates a sound knowledge and understanding of the operation of faculty timetables and knows how to recommend changes designed to improve teaching and learning	Has a thorough knowledge of timetable management and how to make changes to improve the quality of teaching and learning. Knows how to train others in the use and management of timetables
5.7 Chemical Inventory, Hazardous Substances Register, SDS's	With guidance learns how to access SDS's, use SDS's to identify Hazardous Substances, and develop a Hazardous Substances Register With guidance learns how to undertake risk assessments in the use of hazardous substances and develop appropriate control methods	Demonstrates a sound knowledge and understanding of how to access SDS's, uses SDS's to identify Hazardous Substances, and develop a Hazardous Substances Register Demonstrates a sound knowledge and understanding of how to undertake risk assessments in the use of hazardous substances and develop appropriate control methods	Demonstrates a thorough knowledge and understanding of how to access SDS's, uses SDS's to identify Hazardous Substances, and develop a Hazardous Substances Register. Knows how to identify and recommend alternate chemicals for use in investigations Demonstrates a thorough knowledge and understanding of how to undertake risk assessments in the use of hazardous substances and develop appropriate control methods. Knows how to identify and recommend alternate chemicals for use in investigations	Demonstrates a thorough knowledge and understanding of the Chemical Safety in Schools regulation and develops policies and procedures for its implementation within the faculty. Trains others in the use of the regulation Demonstrates a thorough knowledge and understanding of how to undertake risk assessments in the use of hazardous substances and develop appropriate control methods. Knows alternate chemicals to use in investigations

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DOMAIN 2: PROFESSIONAL PRACTICE

6. Delivery of the practical aspects of the Science Curriculum.

Descriptor	Science Assistant (Trainee)	Science Technician	Senior Science Technician	Science Laboratory Manager
6.1 Preparation of materials and equipment for practical activities	Develops skills in recognizing and collating equipment	Assists with the preparation and collation of materials and equipment: <ul style="list-style-type: none"> • Perishable and non-perishable consumables • Digital and analogue measuring tools • Biological specimens of plants and animals • Biological samples for dissections • Microbiological media • Microscopy specimens and tools • Glassware • Chemicals, stains and indicators • Geological specimens and tools • Specialist physics equipment • Radiation sources and equipment 	Prepares and gives advice on materials and equipment for practical activities <ul style="list-style-type: none"> • Perishable and non-perishable consumables • Digital and analogue measuring tools • Biological specimens of plants and animals • Biological samples for dissections • Microbiological media • Microscopy specimens and tools • Glassware • Chemicals, stains and indicators • Geological specimens and tools • Specialist physics equipment • Radiation sources and equipment 	Prepares and gives advice on the purchasing of materials and equipment for practical activities <ul style="list-style-type: none"> • Perishable and non-perishable consumables • Digital and analogue measuring tools • Biological specimens of plants and animals • Biological samples for dissections • Microbiological media • Microscopy specimens and tools • Glassware • Chemicals, stains and indicators • Geological specimens and tools • Specialist physics equipment • Radiation sources and equipment
6.2 Demonstration of practical activities and skills to students, teachers	Not applicable	Develops skills in demonstration of practical activities and skills to students, teachers	Demonstrates practical activities and skills to students, teachers	Demonstrates and suggests relevant practical activities and skills to students, teachers
6.3 Development of appropriate practical activities	Not applicable	Assists with the trialling and development of appropriate practical activities	Trials experiments and develops appropriate practical activities	Assesses, designs and develops appropriate practical activities
6.4 Sourcing and making equipment	Develops skills in sourcing and making equipment	Assists with the sourcing and making of equipment	Sources and makes equipment	Designs, sources and makes equipment

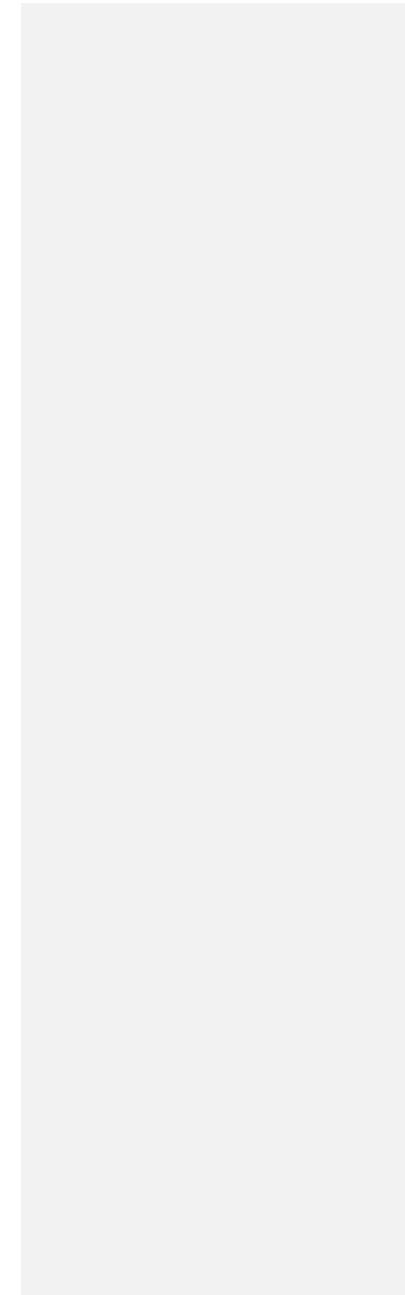
Comment [GF10]: Do the descriptors contained within this Standard adequately cover all aspects of the Standard?
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6.5 Care of flora and fauna	Develops skills in basic care of flora and fauna	Assists in the care of flora and fauna	Ensures that flora and fauna are cared for appropriately	Gives advice on the selection, provision and procurement of suitable flora and fauna
6.6 Management of microbiological materials	Undertakes training in the preparation and disposal of microbiological materials	Assists in the preparation and disposal of microbiological materials.	Ensures that all microbiological materials are prepared and disposed of according to safe practice	Gives advice on the selection and sourcing of microbiological materials and ensures that all microbiological materials are prepared and disposed of according to safe practice

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7. Create and maintain safe, efficient and supportive science teaching environments.

Descriptor	Science Assistant (Trainee)	Science Technician	Senior Science Technician	Science Laboratory Manager
7.1 Storage of chemicals	Follow directions for the safe storage of chemicals	Have a working knowledge of the correct system for the safe storage of chemicals	Organise and maintain a chemical storage system according with the policies and regulatory requirements	Develop policies and procedures to ensure regulatory requirement are met
7.2 Storage of equipment	Under direction store equipment appropriately	Have a working knowledge of the storage of laboratory equipment	Organise and maintain a system for storage of equipment	Develop an inventory for laboratory equipment, updating as required
7.3 Labelling	Follow correct procedures for the labelling of all laboratory chemicals	Label all laboratory chemicals according to policies and regulations	Ensure all laboratory chemicals are labelled according to policies and regulations	Develop a labelling system for the correct labelling of all laboratory chemicals, ensuring it meets regulatory requirements
7.4 Housekeeping and organisation	Follow direction to maintain the laboratories "fit for purpose" i.e. clean; equipment in good order and put away. Under direction maintain a safe workplace.	Ensure that all science facilities are fit for purpose, purchase consumable supplies when required	Maintain a housekeeping system to ensure science facilities are in good order. Organise routine maintenance as required. Order equipment and consumable supplies as needed.	Develop systems of work to maintain science facilities in good working order. Prepare a budget for annual expenditure including large capital items. Seek quotes on large expenditure items.
7.5 Provide appropriate advice on safety issues	Follow advice on safety issues. Give basic safety advice to teachers and students.	Provide advice on safety matters to co-workers, teachers and students regarding the practical activities	Instruct teachers, students and co-workers on safety practices in the laboratories and explain Risk Assessment information	Develop safe practices for the science facility. This includes developing Risk Assessments in conjunction with teachers. Formally instruct teachers and other staff on safety in the laboratories, including Induction Training sessions.
7.6 Safety audits	Participate in safety audits of the science laboratories under direction	Assist in the safety audit process	Carry out safety audits of the science facilities following the school's policy	Develop a safety audit policy and procedures. Ensure regular safety audits are undertaken in the science department.

Comment [GF11]: Do the descriptors contained within this Standard adequately cover all aspects of the Standard?
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8. Practice sound laboratory techniques.

Descriptor	Science Assistant (Trainee)	Science Technician	Senior Science Technician	Science Laboratory Manager
8.1 Laboratory techniques in the Physical Sciences	<p>Develops skills in the use of equipment to take measurements</p> <p>Develops skills in processing and presenting data</p> <p>Undertakes training in the use of physics equipment used in the laboratory</p>	<p>Applies and has basic skills in the use of equipment to take measurements</p> <p>Has basic training in how to process and present data</p> <p>Follows set procedures in setting up and using physics equipment</p>	<p>Is competent in the use of equipment to take measurements</p> <p>Demonstrates skills in processing, presenting and interpreting data.</p> <p>Demonstrates competence in setting up and using physics equipment</p>	<p>Is fully competent in training others to use equipment to take measurements.</p> <p>Supervises others when collating, presenting and interpreting data.</p> <p>Is skilled in setting up and using physics equipment in the laboratory and may recommend alternative uses and/or equipment</p>
8.2 Laboratory techniques in the Chemical Sciences	<p>Undertakes training in environmentally sustainable work practices</p> <p>Develops skills in following directions to prepare solutions for use in the classroom</p> <p>Develops skills in undertaking a range of simple chemical testing procedures</p> <p>Undertakes training in the use of chemical equipment used in the laboratory</p>	<p>Follows set procedures in environmentally sustainable work practices</p> <p>Performs the calculations needed to prepare solutions</p> <p>Has basic skills in a range of simple chemical testing procedures</p> <p>Follows set procedures in setting up and using physics equipment</p>	<p>Is competent in following environmentally sustainable work practices</p> <p>Performs the calculations needed to prepare, standardise and use solutions</p> <p>Is competent in preparing and using equipment to be used in chemical analysis</p> <p>Demonstrates competence in setting up and using chemical equipment</p>	<p>Plans, implements and monitors environmentally sustainable work practices</p> <p>Plans procedures and trains others to perform calculations, and to prepare, standardise and use solutions</p> <p>Trains others to perform a range of procedures used in chemical analysis</p> <p>Is skilled in setting up and using chemistry equipment in the laboratory and may recommend alternative uses and/or equipment</p>

Comment [GF12]: Do the descriptors contained within this Standard adequately cover all aspects of the Standard?
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<p>8.3 Laboratory techniques in the Biological Sciences</p>	<p>Develops safe work practices to follow in the laboratory and the field</p> <p>Learns how to prepare a variety of different culturing media</p> <p>Undertakes training in the use of aseptic techniques in the laboratory</p> <p>Develops skills in safely handling tissues and cell cultures in the laboratory</p> <p>Develops skills in the preparation of simple specimens for microscopic examinations</p> <p>Undertakes training in the use of monocular and binocular microscopes</p> <p>With guidance prepares specimens to be used for dissection</p> <p>With guidance is able to name and demonstrate the correct use of and appropriate cleaning methods for equipment used for dissections</p>	<p>Uses safe work practices in the laboratory and field</p> <p>Is able to access and follow instructions to make different culturing media</p> <p>Uses aseptic techniques in the laboratory</p> <p>Works safely with tissues and cell cultures in the laboratory</p> <p>Has training in the preparation of simple specimens for microscopic examination</p> <p>Has basic skills in the use of both monocular and binocular microscopes</p> <p>Prepares specimens and equipment prior to dissection and uses sound techniques to clean equipment after use</p> <p>Is able to independently dissect some biological specimens</p>	<p>Designs safe work practices to follow in the laboratory and the field.</p> <p>Is able to prepare and safely use a variety of different of media in different investigations</p> <p>Uses and plans aseptic procedures for use in the laboratory</p> <p>Is skilled in the preparation, care and handling of tissues and cell cultures in the laboratory</p> <p>Is competent in the preparation and staining of specimens for microscopic examination</p> <p>Is able to use and maintain both monocular and binocular microscopes</p> <p>Is competent in the preparation of specimens and equipment to be used for dissections and in the cleaning of equipment afterwards</p> <p>Competently dissects a large variety of biological specimens</p>	<p>Designs and teaches others safe work practices to follow in the laboratory and the field.</p> <p>Is able to prepare and use a range of different media and train others in their preparation and use</p> <p>Is able to plan and teacher others aseptic procedures for use in the laboratory</p> <p>Trains others how to prepare, care for and handle tissues and cell cultures in the laboratory</p> <p>Is skilled in researching and using appropriate procedures for preparing specimens for microscopic examination</p> <p>Is able to use, maintain, research and select microscopes appropriate to the school environment</p> <p>Is highly competent in the preparation of specimens, preparation and cleaning of equipment and training methods to be used for biological dissections</p> <p>Competently dissects and is able to train others in appropriate biological dissection techniques</p>
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	<p>Develops skills in the use of simple sampling techniques for use in the field</p> <p>With guidance follows basic conservation principles and practices during fieldwork</p>	<p>Uses sampling techniques for use in fieldwork</p> <p>Makes observations and takes measurements in the field without causing damage to the environment</p>	<p>Is fully competent in the use of a range of field sampling techniques and in selecting the equipment needed for each</p> <p>Competently applies sound conservation principles and practices when conducting fieldwork</p>	<p>Trains others in use of a range of field sampling techniques and the preparation of equipment needed for each</p> <p>Competently applies sound conservation principles and practices when conducting fieldwork and is able to train others in their use</p>
8.4 Laboratory techniques in the Earth, Environment and Space Sciences	<p>With guidance recognises the physical and chemical features of the igneous, metamorphic and sedimentary rocks</p> <p>Follows instructions to make models to demonstrate geological features and other scientific concepts</p>	<p>Is able to identify common examples of igneous, metamorphic and sedimentary rocks</p> <p>Is able to make simple models to demonstrate geological features and other scientific concepts</p>	<p>Is able to use keys to identify a variety of igneous, metamorphic and sedimentary rocks</p> <p>Is able to design and make models to demonstrate geological features and other scientific concepts.</p>	<p>Has an in depth knowledge of the classification and properties of a variety samples of each of the 3 rock types and can teach this to other people</p> <p>Is able to train other technicians how to design and make models to demonstrate geological features and other scientific concepts.</p>
8.5 Skills in the other areas including ICT & AV	<p>With guidance is able to calibrate equipment</p> <p>Undertakes training in the use of basic computer software needed to work in the laboratory and field</p> <p>Undertakes training in the operate of AV equipment in the laboratory and classroom</p>	<p>Is able to use instructions to calibrate equipment.</p> <p>Uses basic software to work effectively in the laboratory and field.</p> <p>Operate basic AV equipment in the laboratory and classroom</p>	<p>Is able to calibrate a wide variety of laboratory equipment.</p> <p>Competently uses a range of software to work efficiently in the laboratory and field</p> <p>Competently operates a wide range of AV equipment in the laboratory and classroom</p>	<p>Is able to train others in the calibration of a wide variety of laboratory equipment.</p> <p>Competently uses a range of software to work efficiently in the laboratory and field and trains others in its use</p> <p>Competently operates and trains others to operate and identify problems in the operation of AV equipment in the laboratory and the classroom</p>

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8.6 OHS Acts, Regulations, Codes of Practice, Standards	Follow established work practices and instructions to maintain a safe work environment	Follows OHS legislation, Regulations and Codes of Practice.	Applies relevant OHS legislation, Regulations and Codes of Practice to work practices	Develops policies and procedures to ensure regulatory requirements are met
8.7 Risk Assessment and Hazard Management	Follow risk control measures to minimise hazards in the workplace	Apply risk assessment control measures to work undertaken in the school laboratories	Identifies hazards in the workplace, undertakes risk assessments and designs appropriate control measures	Carry out laboratory safety audits and risk assessments to control hazards in the school laboratories
8.9 Chemical Safety in Science	Follow directions to use, store and dispose of hazardous substances appropriately	Access relevant documents (SDS) and follow correct procedures for the safe handling of chemicals.	Carry out risk assessments for the use of hazardous substances, store and use chemicals correctly, and dispose of chemical waste according to regulations	Be responsible for the risk assessments for hazardous substances, maintain a register of chemicals, and manage the storage system and disposal of chemicals. Train others in the application of the Chemical Safety in Schools regulation
8.10 Animal Care & Ethics	Follow instructions for the ethical use and care of animals in a school laboratory	Apply appropriate procedures for the ethical use and care of animals in a school laboratory	Carry out procedures for the ethical care and use of animals in the school environment	Develop procedures for the ethical use and care of animals. Liaise with government and other organisations regarding the care and use of animals
8.11 Biological Safety	Follow correct safe work practices to minimise the risk from biological hazards	Apply appropriate procedures to control risks from biological hazards	Carry out risk assessments to control any biological hazards	Develop procedures for the safe handling, storage and disposal of biologically hazardous materials
8.12 Child protection requirements	Have a current "Working with Children" check or other document depending on the State	Have a current "Working with Children" check or other document depending on the State	Have a current "Working with Children" check or other document depending on the State	Have a current "Working with Children" check or other document depending on the State

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9. Facilitate the maintenance and repair of the equipment.

Descriptor	Science Assistant (Trainee)	Science Technician	Senior Science Technician	Science Laboratory Manager
9.1 Maintain, clean instruments e.g. Microscopes, balances	Begins to operate and perform simple cleaning of instruments	Cleans instruments. Follows a maintenance regime as documented in the maintenance register	Maintains and cleans instruments. Develops a maintenance regime and the maintenance register	Knows how to train others to maintain instruments
9.2 Calibrate instruments	Learns the basic concepts of calibration	Performs simple calibrations of instruments	Calibrate instruments	Calibrate instruments and trains others in calibrating instruments
9.3 Undertake glass working	Learns how to perform simple glass manipulation	Manipulates glass in its various forms	Manipulates glass in its various forms	Trains others in working with glass
9.4 Electrical (low voltage), soldering, electronics	Learns how to solder for minor repairs and re-attaching terminals to leads	Makes minor repairs including soldering and manipulating electronic components Decides when the repairs are beyond the scope of personal abilities and when to involve repair services	Makes minor low voltage electrical repairs, soldering and manipulating electronic components Decides when the repairs are beyond the scope of personal abilities and when to involve repair services	Knows how to train others in low voltage electrical repairs and soldering Decides when the repairs are beyond the scope of personal abilities and when to involve repair services
9.5 Liaison with repair services	Liases with line manager to determine the scope of repairs required	Liases with repair services directly	Is able to determine the nature of repairs. Liases with repair services directly	Trains others in determining the scope of repairs required Liases with repair services directly
9.6 Other maintenance and repairs as required	Liases with line manager to determine the scope of repairs required	Is able to determine the nature of repairs	Is able to determine the nature of repairs	Knows how to train others in determining the scope of repairs required

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10. Contribute to the administrative management of the school Science department

Descriptor	Science Assistant (Trainee)	Science Technician	Senior Science Technician	Science Laboratory Manager
10.1 Stock Control	<p>With guidance correctly stores the different types of materials and equipment used on site</p> <p>With guidance undertakes stocktaking and record keeping duties to manage the different types of materials and equipment used on site</p> <p>With guidance learns what disposables and equipment are needed on site.</p>	<p>Correctly stores the different types of materials and equipment used on site</p> <p>Competently undertakes stocktaking and record keeping duties to manage the different types of materials and equipment used on site</p> <p>Determines what disposables and equipment needs to be replaced on site</p>	<p>Has highly developed skills in the correct storage of the different types of materials and equipment used on site and is able to make changes to how and where materials are stored</p> <p>Has highly developed skills in stocktaking and record keeping to manage stock and recommends changes to the processes used on site</p> <p>Determines what disposables and equipment are needed and recommends new equipment to be purchased</p>	<p>Develop policies and procedures to manage the storage of disposables and equipment used on site and trains others in these procedures</p> <p>Develops policies and procedures to manage stocktaking and record keeping on site and trains others in these procedures</p> <p>Determines what disposables and equipment are needed on site and selects new or alternative equipment</p>
10.2 Purchasing Procedures for the Site	<p>Follows instructions when ordering disposables and new equipment</p>	<p>Follows correct procedures for ordering disposables and other equipment needed by the faculty</p>	<p>Uses correct procedures when ordering disposables and other equipment needed by the faculty and makes recommendations about future or alternate stock requirements</p>	<p>Works with other site managers to develop policies and procedure to be followed when purchasing materials and how to trains others in their use. Plans for future acquisitions.</p>
10.3 Management of Budgets	<p>With assistance implements the processes used on site to account for: money coming into the faculty, outgoings and petty cash</p>	<p>Uses appropriate processes within the faculty to account for: money coming into the faculty, outgoings and petty cash</p>	<p>Demonstrates competence when using the appropriate processes within the faculty to account for: money coming into the faculty, outgoings and petty cash. May develop submissions for future or special funding.</p>	<p>Demonstrates competence in managing budgets and developing the necessary policies and procedures used to account for faculty funds. Trains personnel in faculty accounting procedures</p>
10.4 Personnel Management	<p>Works within appropriate social guidelines with other people in a professional workplace</p>	<p>Develops and maintains professional working relationships with other school personnel</p>	<p>Competently develops and maintains professional working relationships with other school personnel. Deals effectively with difficult staff and may be called upon to resolve disputes</p>	<p>Effectively manages personnel including the processes used in advertising for, interviewing and selecting new staff</p>

Comment [GF14]: Do the descriptors contained within this Standard adequately cover all aspects of the Standard?
Do the descriptors demonstrate an appropriate developmental sequence across the 4 levels of classification?

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10.5 Resource Management	Follows instructions to produce, store and manage the use of faculty resources	Demonstrates confidence in producing, storing and managing the use of faculty resources	Competently manages the faculty's resource collection and is able to design and produce special resources requested by teachers	Competently manages the faculty's resource collection, designs and produces resources requested by teachers and develops policies and procedures for the use of resources. May select new resources to improve the delivery of the curriculum
10.6 Timetabling	With guidance develops skills in reading and managing faculty timetables	Demonstrates a sound skills in reading and managing faculty timetables	Demonstrates competence in managing faculty timetables and is able to recommend changes designed to improve teaching and learning	Demonstrates competence in managing faculty timetables and is able to implement changes designed to improve teaching and learning in consultation with the head of department, who has the primary responsibility in this area Trains others in the use and management of timetables
10.7 Chemical Inventory, Haz Substances Register, SDS's	With guidance accesses SDS's, uses SDS's to identify Hazardous Substances, and develops a Hazardous Substances Register With guidance undertakes risk assessments in the use of hazardous substances and develops appropriate control methods	Accesses SDS's, use SDS's to identify Hazardous Substances, and develops a Hazardous Substances Register Undertake risk assessments in the use of hazardous substances and develops appropriate control methods	Demonstrates competence when accessing SDS's, using SDS's to identify Hazardous Substances, and developing a Hazardous Substances Register. Identifies and recommends the use of alternate chemicals when considering risk assessments for investigations. Demonstrates competence when undertaking risk assessments in the use of hazardous substances and develop appropriate control methods. Identifies and recommends alternate chemicals for use in investigations	Demonstrates competence in the development of policies and procedures for the implementation of the Chemical Safety in Schools regulation. Trains others in the use of the regulation Demonstrates competence when undertaking risk assessments in the use of hazardous substances and develop appropriate control methods. Identifies and uses alternate chemicals in investigations
10.8 Licensing Requirements (e.g. radiation, animal ethics, flora and fauna licences)	Become familiar with the necessary licensing requirements	Assist in the documentation required for licensing requirements	Assist in the documentation required for licensing requirements	Ensures that all licencing requirements are met

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DOMAIN 3: PROFESSIONAL ATTRIBUTES

11. Demonstrate effective communication and interpersonal skills.

Descriptor	Science Assistant (Trainee)	Science Technician	Senior Science Technician	Science Laboratory Manager
11.1 Shows effective oral and written communication skills appropriate to the context of the position ³	Able to understand and respond to occupational health and safety risks and practices in the workplace Has effective communication skills and is able to follow straight forward oral and written instructions and exchange relevant information at a basic level	Able to understand and respond to occupational health and safety risks and practices in the workplace Has effective oral and written communication skills and is able to exchange relevant and scientific information at an intermediate level	Able to understand and respond to occupational health and safety risks and practices in the workplace Has effective oral and written communication skills and is able to exchange and explain relevant and scientific information and give feedback at an advanced level	Able to understand and respond to occupational health and safety risks and practices in the workplace Has effective oral and written communication skills and is able to exchange, explain and present relevant and scientific information and give feedback at an advanced level
11.2 Shows effective professional interpersonal skills	Has good interpersonal skills and be able to relate to teaching staff	Liases with teaching staff and other school based and external personnel	Liases with teaching staff and other school based and external personnel Have effective negotiation skills.	Liases with teaching staff and other school based and external personnel Have effective negotiation and leadership skills
11.3 Shows effective computing skills	Able to email and create word processing documents Undertakes training in basic skills in word processing, spread sheet applications and Internet searches Undertakes training in chemical management systems	Able to email and has intermediate skills in word processing, spread sheet applications and Internet searches Accesses databases including chemical management systems Undertakes training in data loggers and associated probeware and new technologies	Able to email and has advanced skills in word processing, spread sheet applications and Internet searches Accesses databases including chemical management systems Able to operate data loggers and associated probeware and new technologies	Able to email and has advanced skills in word processing, spread sheet applications and Internet searches Accesses databases including chemical management systems Able to operate data loggers and associated probeware and new technologies Able to use new technologies in presentations.

Comment [GF15]: Do the descriptors contained within this Standard adequately cover all aspects of the Standard?
Do the descriptors demonstrate an appropriate developmental sequence across the 4 levels of classification?

³There is a divergence of opinion in the working party regarding the inclusion of a requirement to be competent in the English language.

12. Work collegially within their school community and wider professional communities

Descriptor	Science Assistant (Trainee)	Science Technician	Senior Science Technician	Science Laboratory Manager
12.1 Actively contributes to the Science faculty	Attends Science faculty meetings and contributes to relevant discussion	Attends Science faculty meetings and contributes to discussion when appropriate	Instigates discussion on issues relevant to all science faculty staff	Ensures that laboratory issues are raised and discussed at faculty meetings
12.2 Actively contributes to the school community	Attends staff meetings when invited and participates in relevant discussion	Attends Staff meetings when appropriate and participates in relevant discussion	Attends Staff meetings and participates in relevant discussion. Contributes to other areas of the school, such as OHS, Budget and school events (e.g. Open Days)	Participates in school management of OHS, finance or school development programs
12.3 Networks with school science technicians from other sites	Aware of school science networks and science education professional organisations	Participates in school science networks and other science education professional organisations	Develops networks with school science technicians and other professional organisations	Develops networks with school science technicians and other professional organisations and encourages others to do likewise
12.4 Contributes to Science facilities development	Participates in the development of science facilities	Participates in the development of science facilities	Participates in the development of science facilities	Develops plans, in conjunction with other senior staff members for the development of science facilities

Comment [GF16]: Do the descriptors contained within this Standard adequately cover all aspects of the Standard?
Do the descriptors demonstrate an appropriate developmental sequence across the 4 levels of classification?

13. Engage in relevant ongoing professional learning and reflection.

Descriptor	Science Assistant (Trainee)	Science Technician	Senior Science Technician	Science Laboratory Manager
13.1 Belong to their relevant professional association(s)	Is encouraged to join their relevant professional association(s)	Is recommended to join their relevant professional association(s)	Is recommended to join their relevant professional association(s)	Is recommended to join their relevant professional association(s)
13.2 Participates in relevant professional learning	Under direction to participate in specific professional learning	Directed to undertake relevant professional research and reading	Undertakes relevant professional research and reading	Undertakes relevant professional research and reading.
13.3 Reflects on their professional practice to seek constant improvement	Participates in an annual discussion with line manager regarding professional practice for constant improvement	Participates in an annual discussion with line manager regarding professional practice for constant improvement	Reflects annually with line manager regarding professional practice for constant improvement	Reflects on their professional practice to seek constant improvement
13.4 Plans and delivers professional learning for others	Attends professional learning delivered by others	Attends professional learning delivered by others	Plans and delivers professional learning for others	Plans and delivers professional learning for laboratory personnel and teaching staff.

Comment [GF17]: Do the descriptors contained within this Standard adequately cover all aspects of the Standard?
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Appendix 1

List of relevant legislation:

Where there are differences between jurisdictions please refer to your state/territory legislation

- Work Health and Safety Laws with links to legislation by jurisdiction
 - [National — Safe Work Australia](#)
- Animal Ethics with links to legislation by jurisdiction
 - <http://www.animaethics.org.au/home>
- Biological Safety legislation
 - Gene Technology (includes Genetic Manipulation) A national scheme with links to legislation by jurisdiction
 - <http://www.ogtr.gov.au>
- Native Animal legislation
 - [Environment Protection and Biodiversity Conservation Act 1999](#) This legislation sets out the national framework for Environmental Protection.

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Appendix 2

Levels of service

Association of Science Education service standards (Royal Society & ASE, 2001)

Service factor	Description of service standard
0.85	This is the recommended allocation of technician support to science teaching for a compact suite of laboratories with adjoining preparation and storage space. All functions are feasible including the accessing of training and developing opportunities to meet the schools changing needs.
0.70	At this level of allocation provision of the full range of functions will depend upon recruiting well-qualified and experienced technicians. Where the full range is possible there will be a need to prioritise functions and decide on the emphasis of support required. It may still be possible to achieve a balance between resource related, design and development and direct support activities.
0.60	It will not be possible to deliver all functions adequately and a restricted range of priorities will need to be identified. Efficient management of resources and administration are likely to be affected and activities related to design and development of practical programmes and direct support will be in jeopardy. Functions possible may well depend on the skills and experience available and a policy for training will be essential to maintain the service.
0.45	Functions will be markedly reduced and in most cases no more than simple, immediate maintenance and control will be possible. In the long-term efficiency in these will be impaired. The availability and range of resources will become restricted and the development of effective practical programmes may be impaired. A supervisory structure for the less experienced may have to be provided from elsewhere. Regular training will be essential but difficult to accommodate.

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