



**Australian Government**

# **PSPSCI403A Organise and undertake scientific/technological research**

**Revision Number: 1**

## **PSPSCI403A Organise and undertake scientific/technological research**

### **Modification History**

Not applicable.

### **Unit Descriptor**

#### **Unit descriptor**

This unit covers the conduct of scientific or technological research at an experienced level where independent judgment is used to determine the means of achieving objectives within generally directed programs. It includes identifying the research issue and research methodology, organising and carrying out the research and communicating the results.

In practice, organising and undertaking scientific/technological research overlaps with other generalist or specialist work activities such as applying government processes, acting ethically, using resources, gathering and analysing information, working safely etc.

This is a new unit of competency, added to the *Government Science&Technology* Competency field of the Training Package in 2004.

### **Application of the Unit**

Not applicable.

### **Licensing/Regulatory Information**

Not applicable.

### **Pre-Requisites**

Not applicable.

### **Employability Skills Information**

**Employability skills** This unit contains employability skills.

## Elements and Performance Criteria Pre-Content

Elements are the essential outcomes of the unit of competency. Together, performance criteria specify the requirements for competent performance. Text in *bold italics* is explained in the Range Statement following.

## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<b>1. Identify research issue</b>	<p>1.1 Industry analysis and consultation are used to identify likely research issues in accordance with organisational policy and procedures</p> <p>1.2 Issue to be researched that is relevant to the industry and to the organisation's objectives is identified</p> <p>1.3 Issues relating to intellectual property are identified and handled in accordance with organisational requirements</p> <p>1.4 <i>Current</i> and published information relevant to the research issue is identified and analysed</p>
<b>2. Identify research methodology</b>	<p>2.1 Objectives are established in consultation with other researcher/s in accordance with organisational policy and resource requirements</p> <p>2.2 A range of <i>research method/s</i> and <i>analytical techniques</i> is considered and the methodology and techniques are chosen that best enable objectives to be met</p> <p>2.3 Hypothesis is determined and is plausible, relevant and of benefit</p> <p>2.4 Risk management strategies, activities and tasks are determined in accordance with the requirements of the research methodology</p> <p>2.5 Hypothesis and methodology are recorded in accordance with organisational requirements</p>
<b>3. Organise and carry out research</b>	<p>3.1 <i>Resources</i> to conduct the research are <i>acquired</i> in accordance with organisational policy and procedures</p> <p>3.2 Tasks are scheduled and carried out in accordance with research methodology</p> <p>3.3 Research is monitored, data is collected and analysed and contingencies are dealt with in accordance with research requirements</p> <p>3.4 Research results are <i>documented</i> and report/s are prepared within specified timeframes in accordance with organisational requirements</p> <p>3.5 Reports are written clearly and concisely in styles suited to scientific and/or lay audiences in accordance with organisational requirements</p>
<b>4. Communicate research results</b>	<p>4.1 Research results are <i>communicated</i> to the organisation, to the scientific community and/or the industry via publications and presentations in accordance with organisational policy and procedures</p> <p>4.2 Intellectual property is protected in accordance with</p>

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
	organisational requirements

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

This section describes the essential skills and knowledge and their level, required for this unit.

#### Skill requirements

Look for evidence that confirms skills in:

- carrying out research
- using problem solving in the context of scientific/technological research
- using technology for data input, analysis and preparation of reports
- interpreting and preparing reports containing scientific/technological research information using a range of communication styles to suit different audiences and purposes
- responding to diversity, including gender and disability
- presenting research results tailored to different audiences such as regional industry/scientific audience
- applying occupational health and safety and environmental requirements to working in a scientific/technological research environment

#### Knowledge requirements

Look for evidence that confirms knowledge and understanding of:

- research methodologies
- scientific process
- statistics (working knowledge)
- specialist area of expertise
- the industry
- reporting requirements for scientific research, requiring precision of expression and using a range of communication styles to suit different audiences and purposes
- legislation, public sector standards and organisational code of practice as they relate to work in a scientific research/technological environment
- public sector legislation including environmental and occupational health and safety requirements relating to scientific/technological research

## Evidence Guide

### EVIDENCE GUIDE

The Evidence Guide specifies the evidence required to demonstrate achievement in the unit of competency as a whole. It must be read in conjunction with the Unit descriptor, Performance Criteria, the Range Statement and the Assessment Guidelines for the Public Sector Training Package.

#### Units to be assessed together

- *Pre-requisite* units that must be achieved prior to this unit: *Nil*
- *Co-requisite* units that must be assessed with this unit: *Nil*
- *Co-assessed units* that may be assessed with this unit to increase the efficiency and realism of the assessment process include, but are not limited to:

PSPETHC401A Uphold and support the values and principles of public service

PSPGOV402B Deliver and monitor service to clients

PSPGOV403B Use resources to achieve work unit goals

PSPGOV406B Gather and analyse information

PSPGOV422A Apply government processes

PSPOHS401B Implement workplace safety procedures and programs

#### Overview of evidence requirements

In addition to integrated demonstration of the elements and their related performance criteria, look for evidence that confirms:

- the knowledge requirements of this unit
- the skill requirements of this unit
- application of the Employability Skills as they relate to this unit (see Employability Summaries in Qualifications Framework)
- scientific/technological research organised and undertaken in a range of (3 or more) contexts (or occasions, over time)

#### Resources required to carry out assessment

These resources include:

- legislation, procedures, guidelines and protocols
- research guidelines and methodologies relating to scientific/technological research
- industry information
- risk management strategies relating to scientific/technological research
- case studies and workplace scenarios to capture a range of different research situations

#### Where and how to assess evidence

Valid assessment of this unit requires:

- a workplace environment or one that closely resembles normal

## EVIDENCE GUIDE

work practice and replicates the range of conditions likely to be encountered when organising and undertaking scientific/technological research, including coping with difficulties, irregularities and breakdowns in routine

- scientific/technological research undertaken in a range of (3 or more) contexts (or occasions, over time)
- evidence of research conducted and report/s and/or articles published locally
- evidence of research presentation/s for regional industry/scientific audience

Assessment methods should reflect workplace demands, such as literacy, and the needs of particular groups, such as:

- people with disabilities
- people from culturally and linguistically diverse backgrounds
- Aboriginal and Torres Strait Islander people
- women
- young people
- older people
- people in rural and remote locations

Assessment methods suitable for valid and reliable assessment of this competency may include, but are not limited to, a combination of 2 or more of:

- demonstration
- observation
- portfolios
- projects
- questioning
- authenticated evidence from the workplace and/or training courses

### **For consistency of assessment**

Evidence must be gathered over time in a range of contexts to ensure the person can achieve the unit outcome and apply the competency in different situations or environments

## Range Statement

### RANGE STATEMENT

The Range Statement provides information about the context in which the unit of competency is carried out. The variables cater for differences between States and Territories and the Commonwealth, and between organisations and workplaces. They allow for different work requirements, work practices and knowledge. The Range Statement also provides a focus for assessment. It relates to the unit as a whole. Text in *italics* in the Performance Criteria is explained here.

- |   |  |
|---|--|
| <i>Current information may include</i>      | <ul style="list-style-type: none"> <li>• other research in progress locally, nationally and internationally</li> <li>• recently published information</li> <li>• unpublished information</li> </ul>  |
| <i>Research methods may include</i>         | <ul style="list-style-type: none"> <li>• single experiment</li> <li>• chain of experiments</li> </ul>  |
| <i>Analytical techniques may include</i>    | <ul style="list-style-type: none"> <li>• statistical analysis</li> <li>• sample analysis</li> </ul>  |
| <i>Resources may include</i>                | <ul style="list-style-type: none"> <li>• human</li> <li>• physical</li> <li>• monetary</li> <li>• design specifications</li> <li>• technical manuals</li> <li>• componentry</li> <li>• radioactive samples</li> </ul>  |
| <i>Acquisition of resources may include</i> | <ul style="list-style-type: none"> <li>• allocation from within the organisation</li> <li>• allocation from external source/s</li> </ul>   |
| <i>Documented may include</i>               | <ul style="list-style-type: none"> <li>• complete record to be held internally within the organisation</li> <li>• preparation of research results for publication</li> </ul>   |
| <i>Communication of results may include</i> | <ul style="list-style-type: none"> <li>• internal reporting verbally and in writing</li> <li>• publishing material in industry journals</li> <li>• publishing reports for scientific audiences</li> <li>• publishing reports/articles for lay audiences</li> <li>• presentations at seminars and scientific conferences</li> </ul> |

### Unit Sector(s)

Not applicable.



## **Competency field**

**Competency field**            Government Science&Technology