



Australian Government

Department of Education, Employment and Workplace Relations

PMLTEST409A Capture and manage scientific images

Release: 1

PMLTEST409A Capture and manage scientific images

Modification History

Unit Descriptor

This unit of competency covers the ability to capture accurate and reproducible images of scientific (environmental, medical and technical) subjects using a scientific approach and enterprise procedures/protocols to ensure the integrity of the image. It also includes the ability to generate and maintain pre and post image capture records to ensure that images can be reproduced if required in the future.

The unit has no prerequisites.

This unit of competency is applicable to personnel in all industry sectors who capture images as part of their main job role. Personnel who capture images, as a substantial part of their job role, should consider accessing the following units of competency from the **CUV40403**

Certificate IV in Photoimaging from the **Visual Arts, Crafts and Design Training**

Package CUV03:

CUVPHI04A Apply photoimaging lighting techniques

CUVPHI05A Use a 35mm SLR camera or digital equipment

CUVPHI06A Plan and carry out image capture in response to brief

CUVPHI207A Process photoimages to work print/file stage.

Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These are found at the end of this unit of competency under the section This competency in practice.

Application of the Unit

Licensing/Regulatory Information

Pre-Requisites

Employability Skills Information

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance Criteria describe the level of performance required to demonstrate achievement of the element.

Elements and Performance Criteria

Elements and Performance Criteria

Element	Performance Criteria
1 Establish requirements for image capture	1.1 Define requirements and purpose of the work and create a brief 1.2 Choose an imaging technique that maintains the integrity and veracity of the subject and fulfils the work requirements 1.3 Plan the work using technical knowledge to ensure an effective and efficient result
2 Plan and set up the shoot	2.1 Select and assemble the required equipment 2.2 Follow ethical and legal work practices at all times 2.3 Assess risks or hazards and implement safety procedures 2.4 Prepare the subject to achieve the brief
3 Capture and reproduce the required image	3.1 Expose media or film and accurately document the work in progress 3.2 Review the image against the work requirements and repeat if necessary 3.3 Reproduce the image to specification
4 Keep records and deliver images	4.1 Accurately and retrievably record the request, technical specifications and images so that they are retrievable 4.2 Store records safely and securely to archival standards 4.3 Follow copyright and crediting policies and procedures 4.4 Make the images available to the client, discuss the results and ensure that requirements have been met.

Required Skills and Knowledge

Evidence Guide

The Evidence Guide describes the underpinning knowledge and skills that must be demonstrated to prove competence.

Critical aspects of competency

Competency must be demonstrated in the ability to perform consistently at the required standard. In particular, assessors should look to see that the candidate:

- can create and interpret a brief

- can apply an imaging technique that best meets the specifications and purpose of the job, consistent with enterprise procedures

- provides a back up system of image capture when shooting images

- produces consistent high quality, cost effective outcomes for clients

- keeps accurate records that allow future replication of images

- works safely and in an ethical manner consistent with legislation, regulations and Codes of Practice.

Underpinning knowledge

Competency includes the ability to apply and explain:

- repercussions of manipulation of images and differences between adjustment and manipulation

- scientific approach and protocols to ensure integrity of images

- veracity of different types of storage media

- relevant copyright, moral rights and intellectual property issues and legislation

- relevant health, safety and environment requirements

- enterprise policies and procedures for capturing and managing scientific images.

Assessment context and methods

This unit of competency is to be assessed in the workplace or simulated workplace environment.

The following assessment methods are suggested:

- review of portfolio of work completed by candidate

- feedback from clients and supervisor

- oral or written questions to assess underpinning knowledge

- case studies to assess the candidate's approach to different subjects and use of a variety of imaging techniques.

In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. Questioning techniques should suit the language and literacy levels of the candidate.

Interdependent assessment of unit

This unit of competency may be assessed with:

PMLTEST519A Prepare animal and plant material for display.

Resource implications

Resources may include:

- appropriate facilities, equipment and materials for photoimaging

- enterprise procedures, equipment manuals, industry catalogues and journals.

This competency in practice

Biomedical, biotechnology, environmental

It's Friday afternoon and a technical officer in a university biology faculty is asked, at short notice, to assist a postgraduate student to obtain images to support a presentation of her work at an international conference. She's flying out of the country to the conference on Sunday. The officer discusses the requirements with the student and determines that the images are needed for a poster presentation to show the differences between sizes of fungal spores. It is agreed that colour prints of four different sized spores are to be produced using a camera coupled to a stereomicroscope. Given the time constraints, a decision is made to use a digital image that can be reproduced on site. The images are produced on Friday evening and the student produces her poster on Saturday. The details of the subject, conditions and the images themselves are carefully stored for later use in the student's thesis.

Key Competencies

The seven key competencies represent generic skills considered for effective work participation. The bracketed numbering against each of the key competencies indicates the performance level required in this unit. These are stand-alone levels and do not correspond to levels in the Australian Qualifications Framework (AQF).

Level (1) represents the competence to undertake tasks effectively

Level (2) represents the competence to manage tasks

Level (3) represents the competence to use concepts for evaluating and reshaping tasks.

Collecting, analysing and organising information	Communicating ideas and information	Planning and organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	Level 2	Level 2	Level 2	Level 2	Level 2	Level 2

Range Statement

The range of variables relates to the unit of competency as a whole. It allows for different work environments and situations that will affect performance.

Where reference is made to industry Codes of Practice, and/or Australian/international standards, it is expected the latest version will be used.

Scientific images may include photographic, digital, X-ray and video images, and prints or transparencies of subjects, such as:

- building sites, environmental survey and monitoring sites

- accident or incident sites, injuries

- forensic evidence

- biological specimens

- histological sections

- live animals

- chromatography gels.

Other imaging techniques may include:

- direct transformation from images to data, such as reading of DNA sequencing gels

- autoradiations

- micrographs

- other non visible light sources, such as ultraviolet light, fluorescence and phosphorescence

- electron micrographs.

Job requirements and brief may include:

- description and specification of work, including constraints, due date

- purpose of the image

- specifications, such as size, purpose, audience, medium and style

- interviewing and collecting information from the client

- keeping records, request forms, notes.

Purposes of the image may include:

- publication as a thesis, presentation or on the web

- temporal serial recording of changes over time

- display as a poster, diorama, print or projection

- preview, snapshot or proof of an image for production at a later stage

- records of data for inclusion in databases

- use in forensic investigation or court proceedings.

Planning of the job may include:

- choice of type of image, media, site and conditions

- preparation of the subject, such as: make-up, choice of whole or part, staining, dissection,

- mounting, animal handling, setting up a light path for a microscope, appropriate magnification

- technical requirements, such as: resolution, film type, tripods, shutter speed, lens type, colour differential

- back up method and equipment for image capture

- specification of final product, size, delivery, number, cost

- position of subject.

Equipment may include:

- lighting

- backdrops

- camera systems and accessories.

Hazards may include:

microbiological organisms and agents associated with soil, air, water, blood and blood products, human or animal tissue and fluids

solar radiation, dust, noise

chemicals and radioisotopes

X rays and other sources of electromagnetic radiation (laser, UV)

manual handling of heavy objects

slips, trips and falls, falling objects, moving machinery (for example, on building sites)

pedestrian and vehicular traffic.

Safety procedures may include:

recognising and observing hazard warnings and safety signs

use of personal protective equipment, such as hard hats, hearing protection, gloves, safety glasses, goggles, face guards, coveralls, gown, body suits, respirators and safety boots

following required containment procedures through the use of appropriate equipment, such as biohazard containers, laminar flow cabinets, Class I, II and III biohazard cabinets and Class PCII, PCIII, and PCIV physical containment facilities

use of material safety data sheets (MSDS)

handling and storage of all hazardous materials and equipment in accordance with labelling, materials safety data sheets and manufacturer's instructions

following established manual handling procedures.

Ethical and legal work practices include consideration of:

industry Codes of Practice, contracts, permits, intellectual property, crediting, plagiarism and copyright

moral rights, model release, etiquette, decorum and sensitivity towards the subject, use of a chaperone and confidentiality.

Production of images may include sending images for processing, processing the images or use of commercial software.

Storage of records may include the brief, technical specifications and images. It may include file management (back ups, data retrieval, storage) and can be paper based, electronic or digital.

Health, safety and environment

All operations to which this unit applies are subject to stringent health, safety and environmental (HSE) requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

All operations assume the potential hazardous nature of samples and require standard precautions to be applied. Users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council and State and Territory Departments of Health. All operations are performed in accordance with standard operating procedures.

Unit Sector(s)