



Australian Government

Department of Education, Employment and Workplace Relations

MSL974008A Capture and manage scientific images

Revision Number: 1

MSL974008A Capture and manage scientific images

Modification History

Not applicable.

Unit Descriptor

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.
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Application of the Unit

Application of the unit	<p>This unit of competency is applicable to laboratory technicians in all industry sectors. Personnel who capture images as a substantial part of their job role, should consider accessing the following units of competency from the <i>CUV40403 Certificate IV in Photoimaging</i> from <i>CUV03 Visual Arts, Crafts and Design Training Package</i>:</p> <ul style="list-style-type: none"> • <i>CUVPHI04B Apply photoimaging lighting techniques</i> • <i>CUVPHI05B Use a 35mm SLR camera or digital equivalent</i> • <i>CUVPHI06B Plan and carry out image capture in response to a brief</i> • <i>CUVPHI07B Process photoimages to work print/file stage</i> • <i>CUVPHI511A Produce technical photoimages.</i> <p>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'.</p>
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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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

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- creating and interpreting a brief
- applying an imaging technique that best meets the specifications and purpose of the job
- using a back-up system of image capture when shooting images
- producing consistent high quality, cost effective outcomes for clients
- keeping accurate records that allow future replication of images
- working safely and in an ethical manner

Required knowledge

Required knowledge includes:

- 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

Evidence Guide

EVIDENCE GUIDE	
<p>The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Assessors should ensure that candidates can:</p> <ul style="list-style-type: none"> • create and interpret a brief • apply an imaging technique that best meets the specifications and purpose of the job, consistent with enterprise procedures • provide a back-up system of image capture when shooting images • produce consistent high quality, cost effective outcomes for clients • keep accurate records that allow future replication of images • work safely and in an ethical manner consistent with legislation, regulations and codes of practice.
Context of and specific resources for assessment	<p>This unit of competency is to be assessed in the workplace or simulated workplace environment.</p> <p>This unit of competency may be assessed with:</p> <ul style="list-style-type: none"> • <i>MSL975015A Prepare animal and plant material for display.</i> <p>Resources may include:</p> <ul style="list-style-type: none"> • appropriate facilities, equipment and materials for image capture • enterprise procedures, equipment manuals, industry catalogues and journals.
Method of assessment	<p>The following assessment methods are suggested:</p> <ul style="list-style-type: none"> • review of portfolio of work completed by the 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. <p>In all cases, practical assessment should be supported by</p>

EVIDENCE GUIDE	
	<p>questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p> <p>Access must be provided to appropriate learning and/or assessment support when required.</p> <p>The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work like environment.</p>
This competency in practice	<p>Industry representatives have provided the case study below to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting.</p> <p>Biomedical, biotechnology, environmental</p> <p>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.</p>

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Codes of practice	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	<p>Scientific images may include the following types of imaging techniques:</p> <ul style="list-style-type: none"> • photographic • digital • X-ray • video • prints • transparencies • direct transformation from images to data, such as reading of DNA sequencing gels • auto-radiations • micrographs • other non-visible light sources, such as ultraviolet (UV) light, fluorescence and phosphorescence • electron micrographs
Scientific subjects	<p>Scientific subjects may include:</p> <ul style="list-style-type: none"> • building sites, environmental survey and monitoring sites • accident or incident sites, and injuries • forensic evidence • biological specimens • histological sections • live animals • chromatography gels
Job requirements and brief	<p>Job requirements and brief may include:</p> <ul style="list-style-type: none"> • description and specification of work, including constraints and due date

RANGE STATEMENT	
	<ul style="list-style-type: none"> • purpose of the image • specifications, such as size, purpose, audience, medium and style • interviewing and collecting information from the client • keeping records, request forms and notes
Purposes of the image	<p>Purposes of the image may include:</p> <ul style="list-style-type: none"> • 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	<p>Planning of the job may include:</p> <ul style="list-style-type: none"> • 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 and appropriate magnification • technical requirements, such as resolution, film type, tripods, shutter speed, lens type and colour differential • back-up method and equipment for image capture • specification of final product, size, delivery, number and cost • position of subject
Equipment	<p>Equipment may include:</p> <ul style="list-style-type: none"> • lighting • backdrops • camera systems and accessories
Hazards	<p>Hazards may include:</p> <ul style="list-style-type: none"> • microbiological organisms and agents associated with soil, air, water, blood and blood products, and human or animal tissue

RANGE STATEMENT	
	<p>and fluids</p> <ul style="list-style-type: none"> • solar radiation, dust and noise • chemicals and radioisotopes • X-rays and other sources of electromagnetic radiation (laser and UV) • manual handling of heavy objects • slips, trips and falls, falling objects and moving machinery (e.g. on building sites) • pedestrian and vehicular traffic
Safety procedures	<p>Safety procedures may include:</p> <ul style="list-style-type: none"> • 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, gowns, 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, MSDS and manufacturer's instructions • following established manual handling procedures
Ethical and legal work practices	<p>Ethical and legal work practices may include consideration of:</p> <ul style="list-style-type: none"> • 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	<p>Production of images may include:</p> <ul style="list-style-type: none"> • sending images for processing • processing the images • use of commercial software

RANGE STATEMENT	
Storage of records	<p>Storage of records may include:</p> <ul style="list-style-type: none"> • the brief, technical specifications and images • file management (back-ups, data retrieval and storage) • paper-based, electronic or digital
Occupational health and safety (OHS) and environmental management requirements	<p>OHS and environmental management requirements:</p> <ul style="list-style-type: none"> • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Unit sector	Testing
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Competency field

Competency field	
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Co-requisite units

Co-requisite units	

Co-requisite units		