



Australian Government

Department of Education, Employment and Workplace Relations

MEM19030A Research and design sustainable objects

Release: 1

MEM19030A Research and design sustainable objects

Modification History

Not applicable.

Unit Descriptor

This unit of competency covers the skills and knowledge required to design products that take into consideration environmental conservation, resources utilisation and sustainable development.

Application of the Unit

This unit is applied to production using sustainable materials, techniques and practices and incorporating them into contemporary product and/or object manufacture.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

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| 1 Explain basic concepts relating to environmental conservation, resources utilisation and sustainable design | 1.1 Describe the basic principles of environmental conservation |
| | 1.2 Identify and analyse a product that makes efficient use of resources |
| | 1.3 Describe the basic principles of sustainable design |

- 2 Develop and utilise product design processes that promote positive environmental outcomes
 - 2.1 Develop criteria to select materials and processes that promote environmental conservation
 - 2.2 Document the manufacturing and materials processes used in the production of a simple product
 - 2.3 Identify substitute materials and manufacturing processes that would make more efficient use of resources
 - 2.4 Recommend materials and processes that minimise materials and energy usage
- 3 Recommend appropriate materials and processes to minimise the impact on the environment
 - 3.1 Define the main benefits of using sustainable materials and processes
 - 3.2 Qualify the main benefits
 - 3.3 Document research sources fully

Required Skills and Knowledge

Required knowledge includes:

- environmental conservation
- resource utilisation
- sustainability
- design processes
- simple material selection processes
- basic product design production processes
- creation and utilisation of appropriate criteria for materials and manufacturing process selection
- common features of design specifications
- commonly used research methodologies
- report writing
- management of time and resources
- effective workplace communication strategies and techniques
- workplace occupational health and safety (OHS) principles and processes

Required skills include:

- conducting research
- communicating research findings
- evaluating sustainability credentials of relevant source materials and completing design documentation
- planning and organising
- interpreting and responding to design criteria
- solving problems sufficiently to identify, rank and recommend appropriate solutions

Evidence Guide

Overview of assessment	A person who demonstrates competency in this unit must be able to conduct research into issues of sustainability for jewellery and object design and analyse findings to inform work decisions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Assessors must be satisfied that the candidate can competently and consistently:</p> <ul style="list-style-type: none"> • implement OHS workplace procedures and practices, including the use of risk control measures • apply sustainable design principles and practices • comply with the design brief requirements • create and utilise appropriate criteria • undertake relevant research and document findings and application of sustainability principles.
Context of and specific resources for assessment	<ul style="list-style-type: none"> • Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. • Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. • Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	<ul style="list-style-type: none"> • Assessment must satisfy the endorsed Assessment Guidelines of the MEM05 Metal and Engineering Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project-related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the

	<p>particular circumstance, but is able to be transferred to other circumstances.</p> <ul style="list-style-type: none">• Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

<p>Principles of environmental conservation</p>	<p>Principles of environmental conservation may include:</p> <ul style="list-style-type: none"> • sustainable materials sourcing practices • reducing energy consumption • re-using materials or components • recycling components • compliance with local, national and international legislation • promoting safety in production, use, maintenance and disposal • minimising pollution • carbon neutral production and off-sets • protection of ecosystems
<p>Principles of sustainable design</p>	<p>Principles of sustainable design may include:</p> <ul style="list-style-type: none"> • life cycle assessment • life cycle energy analysis • recycling products • re-using products or components • utilising renewable resources • minimising damage to ecosystems • reducing loss of biodiversity • substitution of new more efficient technologies • reducing pollution
<p>OHS requirements</p>	<p>OHS requirements may include:</p> <ul style="list-style-type: none"> • legislation • protective equipment • material safety management systems • hazardous substances and dangerous goods code • local safe operation procedures • awards provisions
<p>Criteria</p>	<p>Criteria may relate to:</p> <ul style="list-style-type: none"> • research data • ethical design practices • team discussions • negotiation of priorities • weighting of criteria • flow chart
<p>Efficient use of resources</p>	<p>Efficient use of resources may include:</p> <ul style="list-style-type: none"> • minimising waste

	<ul style="list-style-type: none"> • using renewable resources • minimising use of non-renewable resources • reduction in total cost of production • re-use • recycle • redesign • margin of safety • factor of safety
Recommending materials and processes	<p>Recommending materials and processes may involve:</p> <ul style="list-style-type: none"> • material specifications • manufacturing processes • production costs • quality control • design specification • written notes with rationale or description • health and safety considerations
Defining the main benefits	<p>Defining the main benefits may include:</p> <ul style="list-style-type: none"> • diagrams • ranking benefits • document empirical evidence • drawings or sketches (manual or computer-aided design (CAD) and drafting • electronic presentations • illustrations • layouts • mock-ups • models • plans • verbal presentations • written notes with rationale or description

Unit Sector(s)

Jewellery and horological

Custom Content Section

Not applicable.