

Engineering Skills 2019 v1.0

Sample assessment instrument

July 2018

Project — Manufacturing braziers for clients

Information for teachers

This sample has been compiled by the QCAA to help and support teachers in planning and developing assessment instruments for individual school settings.

Schools develop internal assessments for each Applied subject, based on the learning and assessment described in the approved study plan.

Purpose of the project

This technique assesses a response to a single task, situation and/or scenario in a module of work that provides students with authentic opportunities to demonstrate their learning in both 'Industry practices' and 'Production processes'. The student response will consist of a collection of at least two assessable components, demonstrated in different circumstances, places and times, and may be presented to different audiences and through different modes.

Further information about the specifications for this assessment technique can be found in the Assessment techniques section of the Engineering Skills syllabus.

Assessment dimensions

This assessment instrument is used to determine student achievement in the following dimensions:

- Knowing and understanding
- Analysing and applying
- Producing and evaluating

In Engineering Skills, all objectives from each dimension must be assessed in each Project.

Subject	Engineering Skills
Technique	Project — Manufacturing braziers for clients
Unit number and module number and name	Unit: 3 Module: 3. Welding and fabrication enterprise

Conditions	Units 3–4
Product component	Braziers with sheet metal ash trays
Multimodal component	
<ul style="list-style-type: none"> • non-presentation 	8 A4 pages max (or equivalent)
Further information	
Duration (including class time)	12 weeks
Individual/group	Component 1: Product — completed in small groups with results awarded individually Component 2: Multimodal — completed individually
Resources available	Access to manufacturing space, tools and machines Detailed drawings and technical information

Context

As a class, we have been exploring engineering skills used in manufacturing enterprises for production processes. We have developed skills in interpreting drawing specifications and planning to safely and efficiently create an engineering product using a production line process. This task will be undertaken in the context of a welding and fabrication enterprise.

Task

Demonstrate and document industry practices and production processes and develop a plan to implement a production line for the manufacture of braziers.

The task includes two components.

- Component 1: Product
In a small group, demonstrate the application of fundamental production skills and the adaptation of procedures to create a teacher-specified number of braziers from detailed predefined specifications using a production line.
- Component 2: Multimodal
Individually develop a digital portfolio with photographs and sketches to document and evaluate your use of industry practices and production processes in the planning and creation of braziers.

To complete this task, you must:

Component 1: Braziers

Select, apply and demonstrate fundamental production skills to create the braziers in a production line, ensuring you

- work cooperatively with others in the workplace
- use safe working practices and procedures
- interpret and analyse specifications from a detailed technical drawing
- select and sequence production procedures
- maintain quality standards when using production line processes, e.g. jig construction and quality testing to specified tolerances

- select and organise materials and tools
- plan access to machines and power tools
- plan and calculate the cost of materials and consumables
- plan the construction processes, considering any adaptations needed
- demonstrate welding and fabrication skills to create a brazier and ash tray to specifications

Component 2: Photographic production journal

Use photographs, annotations and other documentation to individually record and reflect on your work on the project, including

- detailed risk assessments (workplace health and safety)
- description of the expectations of work roles and teamwork in a production line process
- description of the quality standards and selection of construction processes
- plans for time management
- calculation of cost (profit and loss)
- documentation of the organisational structure of engineering workplaces using production line processes
- evaluation of industry practices and production processes
- recommendations for improvement of industry practices and production processes used in the created product (brazier).

Checkpoints

- Term [X] Week [X]/[Date]: Establish production line and prepare for quality testing
- Term [X] Week [X]/[X]: Review production processes after construction of initial braziers
- [Due date]: Submit braziers and photographic production journal

Authentication strategies

Your teacher will use ways to check that the work you are assessed on is your own work.

- When working as part of a group, your individual response is assessed through photographic evidence of completed tasks and skills.
- Discuss with your teacher or provide documentation of your progress at indicated checkpoints.
- Your teacher will observe you completing work in class.
- Take part in interviews or consultations with your teacher as you develop your response.
- Submit drafts and respond to teacher feedback.
- Acknowledge all sources used.
- Your results may be cross-marked by a teacher from another class.

Stimulus

Photographs of braziers and technical drawings to indicate dimensions, materials and processes for manufacturing the brazier will be provided by the teacher.

Instrument-specific standards matrix

	Standard A	Standard B	Standard C	Standard D	Standard E
Knowing and understanding	<p>The student work has the following characteristics:</p> <ul style="list-style-type: none"> comprehensive description of industry practices in manufacturing tasks consistent and proficient demonstration of fundamental production skills informed and accurate interpretation of drawings and technical information. 	<p>The student work has the following characteristics:</p> <ul style="list-style-type: none"> detailed description of industry practices in manufacturing tasks effective demonstration of fundamental production skills effective interpretation of drawings and technical information. 	<p>The student work has the following characteristics:</p> <ul style="list-style-type: none"> description of industry practices in manufacturing tasks demonstration of fundamental production skills interpretation of drawings and technical information. 	<p>The student work has the following characteristics:</p> <ul style="list-style-type: none"> statements about industry practices in manufacturing tasks partial demonstration of aspects of fundamental production skills statements about drawings and technical information. 	<p>The student work has the following characteristics:</p> <ul style="list-style-type: none"> inconsistent statements of industry practices minimal demonstration of aspects of fundamental production skills inconsistent statements about drawings and technical information.
	Analysing and applying	<p>The student work has the following characteristics:</p> <ul style="list-style-type: none"> thorough analysis of manufacturing tasks to proficiently organise materials and resources discerning selection and proficient application of production skills and procedures in manufacturing tasks coherent and succinct use of visual representations, language conventions and features to communicate for particular purposes. 	<p>The student work has the following characteristics:</p> <ul style="list-style-type: none"> effective analysis of manufacturing tasks to organise materials and resources relevant selection and purposeful application of production skills and procedures in manufacturing tasks effective use of visual representations, language conventions and features to communicate for particular purposes. 	<p>The student work has the following characteristics:</p> <ul style="list-style-type: none"> analysis of manufacturing tasks to organise materials and resources selection and application of production skills and procedures in manufacturing tasks use of visual representations, language conventions and features to communicate for particular purposes. 	<p>The student work has the following characteristics:</p> <ul style="list-style-type: none"> partial analysis of manufacturing tasks to organise some materials and resources partial application of aspects of production skills and procedures in manufacturing tasks vague use of visual representations, language conventions and features to somewhat communicate.

	Standard A	Standard B	Standard C	Standard D	Standard E
Producing and evaluating	The student work has the following characteristics:	The student work has the following characteristics:	The student work has the following characteristics:	The student work has the following characteristics:	The student work has the following characteristics:
	<ul style="list-style-type: none"> • thorough planning and discerning adaptation of production processes • proficient creation of products that meet specifications • discerning evaluation of practices, processes and products, and valid recommendations made. 	<ul style="list-style-type: none"> • effective planning and adaptation of production processes • methodical creation of products that meet specification with minor variations • effective evaluation of practices, processes and products, and plausible recommendations made. 	<ul style="list-style-type: none"> • planning and adaptation of production processes • creation of products from specifications • evaluation of practices, processes and products, and recommendations made. 	<ul style="list-style-type: none"> • partial planning of production processes • creation of incomplete products with obvious variation from specifications • superficial evaluation of practices, processes and products, and simple recommendations made. 	<ul style="list-style-type: none"> • minimal planning of some production processes • creation of aspects of products • statements about practices, processes or products.