



Government of **Western Australia**
School Curriculum and Standards Authority

SAMPLE ASSESSMENT TASKS

ENGINEERING STUDIES
ATAR YEAR 12

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Sample assessment task

Engineering Studies – ATAR Year 12

Task 1 – Unit 3

Assessment type: Design

Conditions

Period allowed for completion of the task: three weeks

Task weighting

2% of the school mark for this pair of units

Design Project one

(15 marks)

Students identify and investigate design needs. They research and assess existing products to gain an understanding of how others have resolved similar problems, needs or opportunities, and then prepare a design brief that will establish the requirements of a product that they will design and make.

What you need to do

Develop the first part of a design folio; include the following:

- prepare a comprehensive design brief
 - describe the problem, need or opportunity (5 marks)
 - list and justify requirements of the design, i.e. function(s), aesthetics, safety, cost considerations and limitations (5 marks)
- identify and assess **at least three to four** existing solutions or similar products that have been used to resolve the problem, need or identified opportunity
 - critically compare and annotate existing solutions and products, and include supporting images. (5 marks)

What needs to be submitted for assessment	Due date
<input type="checkbox"/> Comprehensive design brief	
<input type="checkbox"/> Annotated images of existing solutions/products to explore how others have sought to resolve the problem or need or opportunity	

Marking key for sample assessment task 1 – Unit 3

Design folio for Project one – design brief, investigation, and concept development	Maximum possible mark	Allocated mark
Describes the problem, need or opportunity that will form the basis for the design brief <ul style="list-style-type: none"> descriptions include insightful observations and conclusions descriptions are well written and provide important and specific details descriptions are vague and generalised 	4–5 2–3 1	/5
Provides comprehensive information about requirements and restrictions that will define the design brief <ul style="list-style-type: none"> includes clear statements about function(s), aesthetics, safety, cost considerations and limitations or restrictions includes details about most of the required criteria covers broad areas of the requirements of the design in limited, general terms only 	4–5 2–3 1	/5
Provides information and assessment of three to four existing products <ul style="list-style-type: none"> includes images, specifications and notes that indicate researched, detailed analysis and comparison of each example includes images, specifications and notes that indicate some analysis of each example includes limited information about existing or similar products includes very limited information about existing or similar products 	4–5 3 2 1	/5
	Total	/15

Teacher feedback:

Sample assessment task

Engineering Studies – ATAR Year 12

Task 2 – Unit 3

Assessment type: Design

Conditions

Period allowed for completion of the task: four weeks

Task weighting

10% of the school mark for this pair of units

Devise concepts for Project one and select the best option for the solution (30 marks)

Students use a design process to prepare **three or four** alternative concepts that could satisfy the criteria specified in the design brief. The concepts are analysed and compared, and the best one identified for development as the solution.

What you need to do

Develop the second part of a design folio; include the following:

- identify and assess more examples of existing solutions that could provide ideas and inspiration for the chosen concept (6 marks)
 - include supporting images with annotations
- identify, research and critique parts, components, materials and energy sources/supplies relevant to the design brief (6 marks)
 - include supporting images, with annotations
 - include any relevant specifications
- produce annotated, pictorial drawings of **three to four** different concepts (8 marks)
- produce annotated, orthographic drawings of these concepts (6 marks)
 - if relevant, present block diagrams to explain the relationships between different subsystems required to fulfil the requirements of the design brief
- evaluate each concept and select the best option (4 marks)

What needs to be submitted for assessment	Due date
<input type="checkbox"/> Further research of existing solutions	
<input type="checkbox"/> Parts, components, materials and energy sources/supplies	
<input type="checkbox"/> Annotated, pictorial drawings	
<input type="checkbox"/> Annotated, orthographic drawings	
<input type="checkbox"/> Evaluation of concepts and best option selected	

Marking key for sample assessment task 2 – Unit 3

Project one – concept development and selection of best option	Maximum possible mark	Allocated mark
Identifies and assesses other examples of existing solutions that could provide ideas and inspiration for the chosen concept <ul style="list-style-type: none"> • several relevant examples are presented, with clear and insightful explanations as to how aspects of these could be incorporated into a proposed design • several relevant examples are presented, with clear explanations as to how aspects of these could be incorporated into a proposed design • only one or two relevant examples are presented, with limited or negligible analysis 	5–6 3–4 1–2	/6
Identifies, researches and critiques parts, components, materials and energy sources/supplies relevant to the design brief <ul style="list-style-type: none"> • examples for each required category are presented, with clear and insightful notes as to how most, if not all, are relevant to the design brief • examples for most required categories are presented, with clear notes as to how these are relevant to the design brief • few examples are presented, with limited, if any, descriptions as to how these are relevant to the design brief 	5–6 3–4 1–2	/6
Presents annotated, pictorial drawings of three to four different ideas <ul style="list-style-type: none"> • the required number of concept drawings are well executed and there is evidence of innovative interpretation of the design brief; annotations are clearly written and relate to the design brief • the required number of concept drawings are well executed and are indicative of sound but conventional responses to the design brief; associated annotations are relevant to the design brief • one or two drawings are presented that are able to be interpreted; these are conventional responses to the design brief; limited annotations accompany the concept drawings • drawings that are presented are very difficult to interpret and annotations are cursory in nature 	7–8 5–6 3–4 1–2	/8
Presents annotated, orthographic drawings of these concepts, including relevant block diagrams <ul style="list-style-type: none"> • orthographic drawings have sufficient, correctly positioned views to provide information to determine overall size and shape of each concept; drawings are neat and accurate, and annotations provide information about parts and major dimensions; if block diagrams are included, then these are neatly drawn and clearly communicate the relationship of each required subsystem • orthographic drawings have correctly positioned views to provide most of the required information to determine overall size and shape of each concept; drawings are neat and accurate; most required information about parts and major dimensions is evident; if block diagrams are included, then these are neatly drawn with each major subsystem present but the relationship between some is not clear • orthographic drawings are missing crucial views or not correctly related and it is difficult to determine overall size and shape of the product; if block diagrams are presented, then there are crucial omissions and/or lack of understanding of how these are related 	5–6 3–4 1–2	/6

Project one – concept development and selection of best option	Maximum possible mark	Allocated mark
Evaluates each concept and selects the best option <ul style="list-style-type: none">each concept is compared, using the same criteria derived from the design brief; criteria are weighted in accordance with importance; the best option is clearly identified and its choice justifiedeach concept is compared, using criteria that are partly consistent with the requirements of the design brief; the reasoning for choosing the selected option is not clearly justified	3–4 1–2	 /4
	Total	/30

Teacher feedback:

Sample assessment task

Engineering Studies – ATAR Year 12

Task 3 – Unit 3

Assessment type: Production

Conditions

Period allowed for completion of the task: two weeks

Task weighting

5% of the school mark for this pair of units

Produce specifications for selected solution for Project one (18 marks)

Students produce and provide information they will use to make the chosen product. There are many forms which this information could take and this will be dependent on the nature of the project being undertaken. The teacher will need to be satisfied that enough critical information is provided such that a third party could use the information to make the product.

What you need to do

Develop the third part of a design folio; include the following:

- working drawings (6 marks)
 - detailed orthographic drawings
 - and/or pictorial
 - and/or schematics
 - and/or artwork
- lists of materials, parts and components, with costing (8 marks)
- develop and prepare a production plan on a timeline. (4 marks)

What needs to be submitted for assessment	Due date
<input type="checkbox"/> Working drawings and/or schematics and/or artwork	
<input type="checkbox"/> Lists of materials, parts and components, with costing	
<input type="checkbox"/> Production plan on a timeline	

Marking key for sample assessment task 3 – Unit 3

Production specifications for the selected solution for Project one	Maximum possible mark	Allocated mark
Provides working drawings. These could take the form of orthographic and/or pictorial and/or schematic and/or specialist artwork. <ul style="list-style-type: none"> • drawings are neat, accurate and clearly annotated, with all required critical information; a third party could use these to produce the product • drawings are neat, accurate and clearly annotated, with most of the required critical information; a third party could use these to produce most of the product without having to consult the designer • drawings are lacking accuracy and/or annotations that provide critical information; a third party would need to regularly consult with the designer to make the product 	5–6 3–4 1–2	/6
Provides lists of materials, parts and components, with costing <ul style="list-style-type: none"> • lists are complete, logical and clearly presented; items are clearly identified, described and costed • lists are mostly complete, logical and clearly presented; items are clearly identified, described and costed • lists are missing a number of items and/or there is a lack of logic as to how these are collated; items are not consistently identified, described and costed • lists are missing a significant number of items and/or there is a lack of logic as to how these are collated; items are rarely identified, described and costed 	7–8 5–6 3–4 1–2	/8
Provides a production plan on a timeline <ul style="list-style-type: none"> • key dates and milestones are clearly communicated; the timeline sets a work schedule that is well thought out and achievable; there is provision to provide evidence of progress through the task • key dates and milestones are clearly communicated; the timeline contains some elements that will need to be adjusted but mostly it is workable; there is provision to provide evidence of progress through the task 	3–4 1–2	/4
Total		/18

Teacher feedback:

Sample assessment task

Engineering Studies – ATAR Year 12

Task 4 – Unit 3

Assessment type: Production

Conditions

Period allowed for completion of the task: four weeks

Task weighting

10% of the school mark for this pair of units

Production of Project one

(25 marks)

Construct Project one by selecting and using appropriate tools and machines and by following safe work practices; use the prepared production plan, materials and available equipment.

What you need to do

- construct Project one by selecting and using appropriate tools and machines, and following safe work practices (10 marks)
- follow the prepared production plan and its associated timeline (5 marks)
 - take photographs during critical phases of production and include these in the design folio
- present the completed project by the deadline specified in the production plan/timeline
 - apply theory to, and use applicable calculations for, those parts of the design that can be quantified to test for function (10 marks)

What needs to be submitted for assessment	Due date
<input type="checkbox"/> Construct project	
<input type="checkbox"/> Production progress notes and photographs in design folio	
<input type="checkbox"/> Completed project	

Marking key for sample assessment task 4 – Unit 3

Production, recording and presentation of Project one	Maximum possible mark	Allocated mark
Production of project <ul style="list-style-type: none"> • all parts shaped, assembled and fitted to a very high degree of accuracy • all parts shaped, assembled and fitted to a high degree of accuracy, with some minor errors or corrections • most parts shaped, fitted and assembled to a high degree of accuracy • most parts shaped, fitted and assembled to an acceptable degree of accuracy but there is evidence of lack of attention to detail • some parts shaped, fitted and assembled to an acceptable degree of accuracy, but there is evidence of missing pieces or poor quality workmanship 	9–10 7–8 5–6 3–4 1–2	/10
Production progress notes and photographs in design folio <ul style="list-style-type: none"> • concise records, with notes and photographs presented throughout the production plan timeline • inconsistent record of progress, with few notes and/or photographs 	3–5 1–2	/5
Completed functioning project <ul style="list-style-type: none"> • completed functioning project; all components tested and function correctly • completed functioning project; all components tested, some components requiring adjustment • completed functioning project, but with inconsistent functioning components requiring adjustments • completed functioning project, but with interrupted functioning requiring adjustments to, or replacement of, components • completed, but non-functioning project; faulty components and/or assembly causing a non-functioning project 	9–10 7–8 5–6 3–4 1–2	/10
Total		/25

Teacher feedback:

Sample assessment task

Engineering Studies – ATAR Year 12

Task 5 – Unit 3

Assessment type: Design

Conditions

Period allowed for completion of the task: one week

Task weighting

2% of the school mark for this pair of units

Evaluate completed Project one

(15 marks)

Evaluate the finished project.

What you need to do

Evaluate the project by presenting evidence, using a range of presentation methods; include the following:

- rating table that offers judgements for each of the criteria specified in the design brief (5 marks)
- descriptions of changes and/or difficulties that occurred during the production phase, and how you dealt with these (5 marks)
- suggestions for how the project might have been improved. (5 marks)

What needs to be submitted for assessment	Due date
<input type="checkbox"/> Rating table	
<input type="checkbox"/> Changes and/or difficulties	
<input type="checkbox"/> Suggestions for improvement	

Marking key for sample assessment task 5 – Unit 3

Evaluation of completed Project one	Maximum possible mark	Allocated mark
Presents rating table <ul style="list-style-type: none"> • all criteria from the design brief are listed and weighted, and ratings applied to determine whether the final product has achieved what was expected or planned • all or most of the criteria from the design brief are listed, and rated to determine whether the final product has achieved what was expected or planned • only some of the criteria from the design brief are listed, and rated to determine whether the final product has achieved what was expected or planned 	4–5 2–3 1	/5
Provides descriptions of changes and/or difficulties <ul style="list-style-type: none"> • well-written descriptions are provided that identify and describe changes and/or difficulties that were experienced during the devising and production phases of the project; appropriate graphics and/or images are presented that enhance the communication of these issues • well-written descriptions are provided that identify and describe changes and/or difficulties that were experienced during the devising and production phases of the project • descriptions provided do not clearly identify and describe changes and/or difficulties experienced during the devising and production phases of the project; graphics and/or images presented are not well utilised to enhance the communication of these issues 	4–5 2–3 1	/5
Makes suggestions for improvement <ul style="list-style-type: none"> • descriptions are well written and provide several sensible and insightful suggestions that would have improved the product; graphics and/or images are used to enhance the communication of these ideas • descriptions are well written and provide several sensible suggestions that would have improved the product; graphics and/or images are used to enhance the communication of these ideas • descriptions are superficial but provide several sensible suggestions that would have improved the product 	4–5 2–3 1	/5
	Total	/15

Teacher feedback:

Sample assessment task

Engineering Studies – ATAR Year 12

Task 10 – Unit 4

Assessment type: Design

Conditions

Period allowed for completion of the task:

May be treated as a briefing in class, then completed as homework over three weeks

Task weighting

2% of the school mark for this pair of units

Research and analyse the life cycle of an engineered product (20 marks)

Research the life cycle of an equivalent, or similar, engineered product to the one being designed during this unit of study. This research may examine the whole product or a significant part or component of it, including its power supply.

What you need to do

Research and prepare a report that includes the following:

- **two or three** definitions of life cycle analysis (LCA) (2 marks)
 - include annotated image(s) and/or diagram(s) that clearly identify each stage of a life cycle
- description of the engineered product being analysed (3 marks)
 - include annotated image(s)
- analysis of the life cycle of the product (10 marks)
 - organise using the headings: materials acquisition, processing materials, manufacture, packaging, transport, maintenance/operation and reuse/recycle/disposal
- conclusions (5 marks)
 - identify and explain the impacts for society, business and the environment.

What needs to be submitted for assessment	Due date
<input type="checkbox"/> Definitions	
<input type="checkbox"/> Description of product being analysed	
<input type="checkbox"/> Life cycle analysis of the product	
<input type="checkbox"/> Conclusions	

Marking key for sample assessment task 10 – Unit 4

Life cycle analysis of an engineered product	Maximum possible mark	Allocated mark
Presents clear definitions <ul style="list-style-type: none"> • clear definitions are given; sources are cited and an image or images are presented that clearly illustrate the concept of an LCA • definitions are given; sources may be unclear and/or an image or images are not presented that clearly illustrate the concept of an LCA 	2 1	 /2
Describes product being analysed <ul style="list-style-type: none"> • clear description of the purpose of the product that offers an insight into its significance for society and/or business and/or the environment; a relevant, annotated image or diagram of the product is included • clear description of the purpose of the product, accompanied by a relevant annotated image or diagram • limited description of the purpose of the product that may or may not be accompanied by an annotated image or diagram of it 	3 2 1	 /3
Reports on the life cycle analysis of engineered product <ul style="list-style-type: none"> • well-written notes that are organised under the required headings; showing evidence of insightful observations, including images, diagrams, and charts or tables that contribute to the communication of essential information • well-written notes that are organised under the required headings, including images, diagrams, and charts or tables that contribute to the communication of essential information • descriptions are organised under most of the required headings, but there are some omissions that detract from the report; includes some images, diagrams and charts or tables that attempt to contribute to the communication of the presented information • required headings are used, but there are some omissions and/or limited observations that detract from the report; minimal use of images, diagrams and charts or tables • limited notes, and superficial analysis of the life cycle of the engineered product 	9–10 7–8 5–6 3–4 1–2	 /10
Draws conclusions from the analysis <ul style="list-style-type: none"> • conclusions are based on the evidence presented in the analysis; these are well written and clearly link to impacts for society and/or business and/or the environment • most conclusions are based on the evidence presented in the analysis; are well written and mostly refer to impacts for society and/or business and/or the environment • most conclusions are not based on the evidence presented in the analysis; links to impacts for society and/or business and/or the environment are unclear/not clear/limited 	4–5 2–3 1	 /5
	Total	/20

Teacher feedback:
