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

SAMPLE ASSESSMENT TASKS

ENGINEERING STUDIES
ATAR YEAR 11

Sample assessment task

Engineering Studies – ATAR Year 11

Task 1 – Unit 1

Assessment type: Design

Conditions
Period allowed for completion of the task: 2 weeks

Task weighting
5% of the school mark for this pair of units

Design project one: Students investigate design needs, different sources of inspiration, and products with specific performance criteria, and then use a design process to design and make a product based on their design research. (25 marks)

What you need to do
Develop the first part of a design folio; include the following:

- Investigate, develop ideas and include in your design folio:
  - performance criteria related to needs
  - different sources of inspiration
  - existing ideas and products
    - include supporting images
  - limitations
    - list available materials and equipment
- Prepare a design brief
  - outline: function, aesthetics, safety, cost considerations and limitations
- Develop ideas and concepts through collected and annotated images, incorporating comments about design fundamentals and factors affecting design, with references back to the design brief
- Include references and your sources of information.

What needs to be submitted for assessment	Due dates
☐ Research on design needs, different sources of inspiration, and products with specific performance criteria	
☐ Design brief	
☐ Annotated design concept images showing concept development	
☐ Listing of materials	

Marking key for sample assessment task 1 – Unit 1

Design folio – Investigation, design brief and concept development	Maximum possible mark	Allocated mark
Provides information on performance criteria and sources of inspiration • detailed comparisons, using design considerations, between a selected number of performance criteria and sources of inspiration, supported by suitable images • a number of different examples with notes describing the differences • a selection of ideas from a single performance criteria /inspiration with some notation about likes/dislikes • collection of ideas, dissimilar images and few notes	7–8 5–6 3–4 1–2	/8
Provides information about existing products • appropriate number of existing similar products, with source referencing, using the design considerations to make detailed comparisons • comparisons between an appropriate number of images against the design considerations • a number of different products with notes describing the differences • a selection of ideas of a single product with limited annotation about likes and dislikes • collection of dissimilar images and few notes	5 4 3 2 1	/5
Provides information about the situation, defining a need or purpose for the product in the design brief • includes clear statements about function, aesthetics, safety, cost considerations and limitations • includes general statements about the likes and dislikes • covers broad areas of the design problem in limited general terms only	5–6 3–4 1–2	/6
Provides ideas and concepts through collected and annotated images, including list of materials • clear development of ideas and concepts showing concept development with annotations on images referring to design fundamentals, materials list and design brief • concept development in the annotated images, with reference to design factors, materials and design brief • concept development is limited by few images and simple annotations, little or some reference to ideas in the design brief	5–6 3–4 1–2	/6
	Total	**/25**

Sample assessment task

Engineering Studies – ATAR Year 11

Task 2 – Unit 1

Assessment type: Design

Conditions
Period allowed for completion of the task: 3 weeks

Task weighting
10% of the school mark for this pair of units

Research the definitions of energy, power and work. Define and compare forms of energy by providing common examples **(24 marks)**

Core Content — Engineering in Society

Energy

- define and describe relationships between
  - energy
  - power
  - work
- define and compare forms of energy
  - kinetic
  - potential
  - thermal
  - chemical
  - electrical
  - electro-chemical
  - electromagnetic (light)
  - sound
  - nuclear

Task description

- Research the definitions of energy, power and work, then produce a detailed paragraph for each definition and a final paragraph on the relationships between the three
- Research sources of information to define and compare the different forms of energy
  - for each form of energy, identify and compare **two (2)** common examples or uses; the two examples should be described in approximately 100 words
  - images may be included and referred to, when comparing the forms of energy
- Include all references in an appropriately set out reference list.

What needs to be submitted for assessment	Due dates
☐ Definitions of energy, power and work	
☐ Comparison of the different forms of energy	

Some suggested references:

Engineering fundamentals: an introduction to engineering / Saeed Moaveni.
Moaveni, Saeed. Toronto: Thomson, 2005. 0-534-42459-7

Engineering Mechanics: an introduction to statics, dynamics and strength of materials **/ Val Ivanoff.**
McGraw-Hill Higher Education, 1996. 0074702394, 9780074702390

Engineering studies: the definitive guide. Volume 1, the preliminary course / Paul L. Copeland.
Copeland, Paul L. Allawah, N.S.W.: Anno Domini, 2000. 0-646-39459-2

Engineering studies: the definitive guide. Volume 2, the HSC course / Paul L. Copeland.
Copeland, Paul L. Allawah, N.S.W.: Anno Domini, 2001. 0-9578770-0-5

Engineering studies communication: a student's workbook / by John Rochford.
Rochford, John. Gosford, N.S.W.: K.J.S., 1999

Marking key for sample assessment task 2 – Unit 1

Research the definitions of energy, power and work. Define and compare forms of energy, by providing common examples	**Maximum possible mark**	**Allocated mark**
Documents definitions and relationships of energy, power and work • accurate detailed definitions and correct use of terminology • minor/small errors or some details missing in each definition, uses terminology correctly to define of each term • terminology incorrect and/or critical information missing	5–6 3–4 1–2	**/6**
• different forms of energy, with two examples or uses of each form of energy • accurate identification of each energy type and correct descriptions of two common examples, using appropriate terminology • correct terminology in identifying each energy type but has minor/small errors in some descriptions of the examples • some energy types defined in general terms, with minor errors in some descriptions of the examples • incorrect use of terminology to identify and describe examples of the energy types	13–16 9–12 5–8 1–4	**/16**
• appropriate reference list • limited or no reference list provided	2 0–1	**/2**
	Total	**/24**

Sample assessment task

Engineering Studies – ATAR Year 11

Task 5 – Unit 1

Assessment type: Production

Conditions
Period allowed for completion of the task: 2 weeks

Task weighting
5% of the school mark for this pair of units

Skills development, as per context specific skills and techniques
You are to complete skills development exercises, as demonstrated by your teacher, prior to the production of the proposed product.
Keep a daily work log/time sheet to record your skills development. **(20 marks)**

What you need to do

Document and include the following in your daily work log/time sheet

- notes on the processes involved in the skills development exercises
- list appropriate machines and tools to make the project

Use the following list of procedures to complete the project

- Follow Occupational Health and Safety (OHS) practices when using appropriate tools and Equipment
- Follow instructions to complete skills development in a production process:
  - mark out details of parts on materials from a plan using appropriate tools
  - select and use appropriate tool/s to accurately cut required parts
  - if required use appropriate tools to shape parts
  - select and use appropriate tools to assemble parts
  - check fit, modify if needed
  - check appearance of assembled skill exercise
  - apply a finish, if required.

What needs to be submitted for assessment	Due dates
☐ Documented daily work log/time sheet	
☐ Completed skill exercises	

Marking key for sample assessment task 5 – Unit 1

Skills development exercises	Maximum possible mark	Allocated mark
Setting out of daily work log/time sheet		
• well recorded detailed and correct description of workshop practices	3	
• main steps of procedure recorded with correct description of work practices	2	
• inconsistent notes, partly correct work practices	1	**/3**
Marking out required from plan, with correct selection and use of tools		
• marking out completed correctly	3	
• marking out completed, minor errors made	2	
• marking out completed but required correction	1	**/3**
Parts cut and shaped, with correct selection and use of tools		
• all parts cut accurately, well-shaped	5–6	
• parts cut, but some minor unevenness	3–4	
• parts cut, but required second attempts	1–2	**/6**
Final presented skill exercise		
• assembled/fitted correctly, appearance shows accurate finished detail	7–8	
• assembled/fitted, with an acceptable finished detail	5–6	
• assembled/fitted, appearance shows minor detail flaws	3–4	
• assembled, but poorly fitting parts, appearance shows detail flaws	1–2	**/8**
	Total	**/20**

Sample assessment task

Engineering Studies – ATAR Year 11

Task 6 – Unit 1

Assessment type: Production

Conditions
Period allowed for completion of the task: 6 weeks

Task weighting
30% of the school mark for this pair of units

Use safe production methods to produce the product
Document a daily work log/time sheet including record of production with photographs of each stage of the production. **(30 marks)**

What you need to document and include in your daily work log/time sheet
- complete an ongoing record of production with photos at each stage of production
- take photographs of completed project

Use the following procedures, complete the product
- Follow proposed production plan
- Use a timeline to construct and test the solution
  - maintain safety requirements
  - record changes to materials lists or costing
  - record regular journal/diary entries
- Construct solution by selecting and using appropriate tools and machines, following safe work practices
- Use ongoing evaluation techniques: diary, journal or folio notes and use of photography to record ongoing progress/decision changes made to the product.

What needs to be submitted for assessment	Due dates
☐ Stages of production (teacher observation)	
☐ Production stage photos/daily work log for making process	
☐ Completed product	

Marking key for sample assessment task 6 – Unit 1

Production of proposed product	Maximum possible mark	Allocated mark
Contents and records in daily work log/time sheet • records ongoing correct workshop practices • inconsistent records of work practices	 2 1	 **/2**
Completed marking out of material/s as required from plan and cut parts to required shapes using appropriate tools • marking out completed correctly, all parts correct size and square • marking out completed, parts correct size • marking out completed with minor corrections, parts correct size • marking out required correction, adjusted parts re-sized • marking out required correction, replacement piece cut	 5 4 3 2 1	 **/5**
Completed assembly/fitting of product parts • all parts and joints assembled, even and square fit • all parts and joints assembled, minor corrected unevenness • all parts and joints assembled minor shape unevenness • all parts and joints assembled, but some required second attempt, some poor fit • parts fitted, joints show poor fit, and some require additional material for second attempt	 9–10 7–8 5–6 3–4 1–2	 **/10**
Completed product and ongoing record of production • correctly assembled/fitted product, presented as per design proposal. Detailed record of production clearly showing each stage of the process • correctly assembled/fitted product, easily identified from the design proposal. Well explained stages of the process in the record of production • completed product, appearance shows minor detail flaws. Limited record of production • assembled product with poorly fitting parts. Appearance and production notes show a deviation from the design and production plan	 7–8 5–6 3–4 1–2	 **/8**
Completed functioning product • completed functioning product • inconsistent functioning product requiring adjustments • production causes a non-functioning product	 4–5 2–3 0–1	 **/5**
	Total	**/30**

Sample assessment task

Engineering Studies – ATAR Year 11

Task 7 – Unit 1

Assessment type: Design

Conditions
Period allowed for completion of the task: 1 week, completed during the final week of the term.

Task weighting
5% of the school mark for this pair of units

Evaluation of completed product
Test and evaluate your finished product by responding to evaluation questions. **(20 marks)**

What you need to do
Write clear statements to evaluate the project

Comment on the following key points, using some relevant or all minor dot points:

Test the solution for correct function and document using checklists and test data

- Did the product meet the design requirements?
  - compare product against design ideas and final drawings
  - comment on appearance, function and safety
    - shape and size
    - finish
    - operating efficiency
    - safe usage
- Did the manufacturing processes achieve a quality product?
  - comment on success of manufacturing skills
    - correct shape and size as per design
    - proportion and fit
    - accurate joins, no gaps
    - manufacturing influences on appearance
  - comment on the production procedure
- Could the shape, size and design features of the product be improved?
  - comment on variations and changes to the design – aesthetics, materials and function.

What needs to be submitted for assessment	Due dates
☐ Completed tested product and evaluation report	

Marking key for sample assessment task 7 – Unit 1

Evaluation of completed product	Maximum possible mark	Allocated mark
Evaluation comments with regards to the specifications and design considerations of aesthetics, function and safety • clear comments referring to specific design considerations combined with justification of design fulfilling design brief requirements • comments outlining major uses and function, and referring to points within design brief • comments linked to design brief expressing personal likes and dislikes about finished project • comments outlining use of project, but little reference to statement of intent • comments reflect superficial evaluation	9–10 7–8 5–6 3–4 1–2	**/10**
Comments on the manufacturing processes • clear flow of evaluation of all procedures with reference to specific procedures, improvements with little or no variation of process • appropriate reporting and/or comment on procedures with some logical evaluation of operations, with little or minor variation of process • comments on procedures with limited evaluation of operations, and some major correction of process • brief comments with few references to major changes to process • comments reflect superficial evaluation	5 4 3 2 1	**/5**
Evaluation comments with regards to the shape and size – improvements • clear comments referring aesthetics, function and safety influenced by shape and size and suggested improvements • comments suggesting improvements referring to major design considerations • comments expressing personal likes and dislikes about improvements • brief reference to design changes to improve function or aesthetics • few comments/superficial notes on improvements	5 4 3 2 1	**/5**
	Total	**/20**