VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

2009 Design and Technology GA 3: Examination

GENERAL COMMENTS

Areas of strength

- Students' understanding of how to annotate a design has improved.
- Knowledge of promoting products was quite good.

Areas of weakness

- Where there are two parts to a question, such as select and justify, students need to think about whether they are able to validate their selection. When making their selection, students should take into account how well they can validate their choice rather than selecting a process, issue or finish and finding that they are unable to complete the question.
- In some cases designs were not well drawn.

SPECIFIC INFORMATION

Section A

Question 1

Marks	0	1	2	3	4	5	Average
%	10	1	3	9	23	53	**4**

Design Factors	Constraints and considerations
Innovation	Should be different
Purpose, function and context	Pull-along toy
Visual, tactile and aesthetic	Painted in attractive colours
Materials – characteristics and properties	Natural materials, environmentally sustainable
Economics – time and financial	An inexpensive toy, needs to be completed/available in January

Students were required to match the specifications from the given table to the relevant design fundamentals. A majority of students were able to extract an appropriate constraint or consideration from the design brief. This seems to indicate that students are very much aware of how a design brief is developed.

Question 2a–b.

The questions focused on the impact of the manufacture of baths on the environment. Students needed to select a manufacturing process that had an impact on the environment. A majority of students were able to answer Question 2a. quite well; however, many had difficulty justifying their answer.

2a.

Marks	0	1	Average
%	47	53	**0.6**

Sourcing of the materials used and/or the bath manufacturing procedures

2b.

Marks	0	1	2	3	Average
%	39	19	21	20	**1.2**

The mining of rare materials and the chemical production of materials can pollute the environment. This pollution can be in the form of dust, or chemical discharge into rivers and the surrounding land.

Students were asked to justify the environmental impact identified in Question 2a. Students needed to demonstrate their understanding of how aspects which influence the design of a product, such as the availability and use of physical resources, impact on the way a product is produced.

Question 2c–d.
These questions focused on students' understanding of an important design factor – function. To get full marks, students needed to select an appropriate criterion and state how that evaluation criterion could be tested.

Question 2c.

Marks	0	1	Average
%	39	61	**0.6**

A criterion based on function that could be used to evaluate both bath A and bath B could be: 'Does the water retain its heat over a period of time?'

Question 2d.

Marks	0	1	2	3	Average
%	37	20	24	19	**1.3**

A possible answer could have been: A test to see if the baths met this evaluation criterion could be to measure the temperature of the water over a period of time, compare the rates of temperature decline and then to assess which bath has better heat retention.

Question 2e.

Marks	0	1	2	3	4	Average
%	35	5	14	20	26	**2**

Students were asked to name and explain a secondary function of bath A. The following is an example of a possible response.
Name: To impress others/prestige
To have an impact when a person enters the bathroom. It is making a statement about having a bath, suggesting that having a bath is also about indulgence.

This question attempted to explore how the function of a product is linked to its appeal. Students found it difficult to explain their answer. Students who gave alternative uses for a bath as the secondary function failed to understand the terminology within the study.

Question 2f.

Marks	0	1	Average
%	18	82	**0.8**

A response to the identification of an end user who would select bath A in preference to bath B was: high socio-economic status, possibly no children.

A majority of students answered this question successfully.

Question 2g.

Marks	0	1	2	3	Average
%	15	24	31	31	**1.8**

Market research would assess the requirements of the end-user or purchasing group. Market research would determine that there is a large enough end-user or purchasing group who would be willing to buy bath A.

This question encouraged students to look at the purpose of market research functions. A majority of students were able see the correlation between market research and its impact on design and production.

Question 2h–i.
These questions required students to compare batch production with continuous production.

Question 2h.

Marks	0	1	Average
%	35	65	**0.7**

A possible response could have been: An advantage of using the batch manufacturing system is that bath A could sell very slowly, therefore the company would not waste money and resources having it in the storeroom.

Question 2i.

Marks	0	1	Average
%	36	64	**0.7**

The following is an example of an acceptable response: A disadvantage of using continuous manufacturing for bath B is that there is no way of making sure that the product will be popular in six months' time and there may be stock left over.

The answers given indicated that students are very much aware of the methods and suitability of different manufacturing systems.

Question 2j.

Marks	0	1	2	3	4	Average
%	26	8	18	23	24	**2.1**

The following is an example of a possible response.
Possible hidden cost: Loss of customers and company reputation
Explanation: If there are no checks for the process of making the bath there could be a high rate of baths being returned due to poor quality. This could lead to the company gaining a poor name and the market losing confidence in the product.

The question asked students to explore how quality management impacts on companies in ways that are not necessarily apparent. The responses given indicated that students were not able to extrapolate how poor quality management processes may impact on the company and how important these processes are to manufacturing industries.

Question 2k.

Marks	0	1	2	Average
%	2	2	95	**2**

The following is an example of a possible response.
Design fundamental – shape
Design application – proportions

Students were asked to discuss the design of the bath using appropriate language with reference to visual, tactile and aesthetic design factors.

Question 2l.

Marks	0	1	2	3	4	Average
%	13	17	30	23	17	**2.2**

The more successful responses tended to integrate the answer rather than seeing the fundamental and application as two separate entities.

Following is an example of a high-scoring response.

> *The shape of the bath is well proportion with the bath having a curve rising from the bottom moving outwards to create an interesting shape and a well proportion bath. This is also reflected with the bath holders distributed equally on each side.*

Question 3

This question focused on marketing. Students' understanding of marketing was quite good and most were able to apply their knowledge successfully.

3a.

Marks	0	1	2	3	Average
%	7	11	28	55	**2.3**

Following is an example of a high-scoring response.

The feedback form gives the manufacturer/distributor information about the purchaser. This information allows the manufacturer to distribute direct advertising to a particular group through the most appropriate methods. It allows the manufacturer to make decisions about targeting a particular age group or gender.

3b.

Marks	0	1	2	3	Average
%	11	19	33	36	**2**

Following is an example of a high-scoring response.

A disadvantage of this method of customer feedback could be that there might only be a specific group of people who are willing to fill in these forms and the company may get a distorted view of the client base. This could affect the way the product is sold and may lead to reduced sales.

3c.

Marks	0	1	Average
%	23	77	**0.8**

Following is an example of a high-scoring response.

Another method of collecting marketing information could be to interview clients who buy other similar products.

Question 4a–b.

The construction of criteria questions was well understood by students. However, students need to be careful that they do not repeat the specification and that they relate the specification to the requirements in the design brief.

Question 4a.

Marks	0	1	Average
%	19	81	**0.8**

Samples of specifications included:

- garment: it looks casual and not too formal
- table and chair: they look like something from a cartoon show
- identification badge: they reflect people's interest in new technology
- condiment unit: it creates the atmosphere of not being in a takeaway store
- multimedia station: something that you would be willing to sit on and still look cool
- recharging stand: it is like the water cooler of the 21st century.

Question 4b.

Marks	0	1	Average
%	28	72	**0.7**

Examples of evaluation criteria that could be used to evaluate the specification included:

- it looks casual and not too formal – Does the garment look casual and not too formal?
- they look like something from a cartoon show – Do the table and chair look like they come from a cartoon show?
- they reflect people's interest in new technology – Do the identification badges have the look of being very 'high tech'?
- they create the atmosphere of not being in a takeaway store – Does the condiment unit create the atmosphere of not being in a takeaway store?
- something that you would be willing to sit on and still look cool – Does the multimedia station look so cool that people will want to sit at it?
- it is like the water cooler of the 21st century – Has the recharging stand achieved the look of the water cooler of the 21st century?

Most students were able to convert the requirements of the specifications into criteria questions.

Question 5

This question tested students' knowledge of approaches to material testing. The question focused specifically on a test that would be relevant prior to the manufacture of the product in response to the design brief. Most students completed this successfully and were able to justify the test.

Question 5a.

Marks	0	1	2	Average
%	23	35	42	**1.2**

Specific tests used on selected material to assess its suitability for the product included:

- cotton: test the durability of the material by washing a test sample and considering the wear and tear of the fabric
- pine: test the quality of a range of timber stains. This would ensure the right choice was made for the colour and durability of the stain
- metal: check a range of welding/soldering techniques and select the most appropriate technique for the angles that need to be made.

5b.

Marks	0	1	Average
%	20	80	**0.8**

Students were asked to nominate the stage when this test could be conducted. This was: stage – design and production.

5c.

Marks	0	1	2	3	Average
%	25	19	27	29	**1.6**

Students were asked why this stage would be appropriate to conduct the test. This could include that the product has not yet been made and it would allow testing of whether the materials chosen are the most appropriate. This testing would reduce the chance of the product failing to meet the requirements of the client and failing to achieve its main objective.

Question 6

The overall marks indicated that students still have difficulty designing a product. The use of pen to draw designs was very disappointing. Students' use of coloured pencils, rulers, highlighters, markers, shape templates and a human figure template in the execution of their designs needs further development.

6i-ii.

Marks	0	1	2	3	4	5	6	Average
%	3	4	12	18	26	19	18	**3.9**

6i.

Function/suitability for intended use

Students had to make sure that the product related directly to what the client, Tourism Victoria, required. The end users were young people aged 17–29.

6ii.

Clarity and detail of drawing

Students needed to ensure that their drawings were easy to understand by using either annotations or measurements.

6iii–iv.

Marks	0	1	2	3	4	5	6	Average
%	8	9	14	18	21	17	14	**3.4**

6iii.

Details of construction and materials

Students needed to ensure that they specified a range of construction techniques relevant to the product being made. This could be done either by highlighting the technique by drawing or specifying it. The specific materials needed to be listed.

6iv.

Representation of Victoria or reference to a particular site or aspect of Victoria

Students' responses needed to go beyond simply stating that they had incorporated a reference to Victoria; they needed to show how well they had done this. This could have ranged from the shape to the colours, but not by simply replicating images onto products.

6v–vi.

Marks	0	1	2	3	4	5	6	Average
%	7	7	18	18	22	15	13	**3.4**

6v.
Unique, innovative and modern in design

Students were required to show some creativity within this question. By referencing what was unique about the product, students could assist the assessors to validate how well they had covered this point.

6vi.
Appeal to a young audience

The young audience was people aged 17–29. Students either failed to acknowledge or failed to indicate how the design appealed to this age group.

Question 7a–f.
These questions allowed students to show their understanding of safety and risk. The majority of students were able to complete this question very well. It was concerning that students did not use the 'degree of difficulties list' from which to select their process. Students need to realise that instructions on the paper must be followed. The question required students to select one process from the degree of difficulties list.

Nominated complex process: rouleau loops

Nominated complex process: dovetail joining

7a.

Marks	0	1	Average
%	13	87	**0.9**

A tool or piece of equipment needed for the chosen process could be (either of):

- a sewing machine
- a router.

7b.

Marks	0	1	Average
%	16	84	**0.9**

A potential hazard when using this tool/piece of equipment could be (one of):

- sewing finger with machine needle
- severed fingers.

7c.

Marks	0	1	2	Average
%	9	26	66	**1.6**

Safety procedures which should be followed to control risks when using this tool/piece of equipment could be:

- ensure there is good lighting. Check all settings are correct prior to using the sewing machine. Focus on the task and try not to converse when sewing
- concentrate at all times, wear protective glasses and ear muffs, and keep hair tied back
- ensure all power is turned off prior to changing the settings or altering the router.

7d.

Marks	0	1	Average
%	14	86	**0.9**

Students were asked whether the processes named were mainly functional/structural or decorative. Responses could have included:

- rouleau loops: decorative
- dovetail joining: functional.

7e.

Marks	0	1	2	Average
%	20	26	55	**1.4**

Explanations why the process in mainly functional/structural or decorative could have included:

- the rouleau holds the button in an interesting way rather than just having a button hole. It creates a decorative element around the button
- the dovetail joint allows the drawer to stay together when in use. The joint locks the two pieces of timber in a way which, despite the movement of a drawer, is nearly impossible for the two pieces to come apart.

Students found it difficult to provide an explanation of whether the process was functional or decorative. Students seemed unsure of the role of their process within their product.

7f.

Marks	0	1	2	3	Average
%	15	24	30	31	**1.8**

Planning/preparation before implementing the nominated process could include: Ensure appropriate material is used. Check the sewing machine and test the process prior to sewing the fabric.

Test the process prior to joining the timber. Lock the two pieces into a dovetail-making unit. Check that the right router bits are available and check the height settings.

Question 8

Marks	0	1	2	3	Average
%	21	27	24	28	**1.6**

The question asked students to articulate the techniques used to ensure an appropriate quality of finish of the product. Students tended not to describe the process but indicated which kind of finish they would apply. The need to describe the process was very important.

The following are examples of successful student answers.

> *When welding make sure that the joints are smooth, if not, use an angle grinder to remove all rough marks from the welding. This would allow no rough edges and create a smooth surface. This would allow the product to be painted creating a highly decorative and clean surface.*

> *The use of high quality materials would allow me to create a product which has already a high visual impact. The sewing with appropriate stitches would allow my dress to create the correct finish. Finally the cutting off thread ends and neaten of seams to have the final professional look.*

Question 9a–b.

Marks	0	1	2	3	4	Average
%	19	17	30	21	14	**2**

The question asked students to describe Australian Standards and how they are applied to their specific product. Students still struggle with definitions and concepts. Some students attempted to apply the idea of standards to their own product.

9a.

Definitions of Australia Standards could be: Australian Standards are rules and regulations for designers and manufacturers to determine standards for certain products such as safety for children's nightwear, toys and cars to ensure products consistently perform at a specified level.

9b.
Following is a sample response that gives a reason why Australian Standards should be considered when designing and producing a product.

My dress has been made to size 8. This allows the user to be aware of what size they are. This is a standard that is used by manufacturers to articulate what size their products come in.

My table and chair will be made from materials that have a consistency such as strength, colour, and flexibility therefore the manufacturer is aware of its strengths and weaknesses.

Question 10a–b.

Marks	0	1	2	3	4	Average
%	19	18	24	23	17	2

This question allowed students to show how they could collect relevant information about the client/end user. The answer had to relate to their product and needed to be specific.

10a.
An aspect that would be important for the designer to know about the end user of the product could have been: My client (Tourism Victoria) will specifically like people eating outdoors.

10b.
A sample response to how the student's design would appeal to the user in terms of this aspect was: The client likes the idea of promoting Victorian tourist sites. Hence the idea of creating furniture that reflects this idea would reinforce their promotion. The furniture has references to the high country and the table top has captured the effect of water by the use of different timbers.

Question 11

Marks	0	1	2	3	Average
%	14	11	28	48	2.1

Successful answers of factors to be considered when calculating the price for the product included:

- cost of production – (materials, equipment, machinery and labour)
- cost of similar products
- demographics of the target group (what they can afford to pay)
- labour cost, machinery and distribution.

Students were required to list three factors that influence the cost of manufacturing the product. The majority of students were able to answer this question without difficulty.