



2008 **Design and Technology GA 3: Examination**

GENERAL COMMENTS

Areas of strength

- There was an increase in students' understanding of design fundamentals and applications.
- There was an increase in students' ability to apply design fundamentals and applications to their work.

Areas of weakness

- Students still found it difficult to understand the difference between the task words used in questions, such as 'list', 'explain', and 'describe'.
- Students need to understand the difference between listing points and writing an answer.
- Students' understanding of promotion still needs further development.
- Students need to learn how to annotate their drawings correctly.

SPECIFIC INFORMATION

Note: Student responses reproduced herein have not been corrected for grammar, spelling or factual information.

For each question, an outline answer (or answers) is provided. In some cases the answer given is not the only answer that could have been awarded marks.

Section A

Question 1a.

Marks	0	1	2	3	4	5	Average
%	3	2	5	14	0	76	4.4

Design fundamental	Specification	
Safety	E	The desk should not have sharp edges
Context and environment of product use	C	Michael's bedroom is quite small
Need	D	Michael needs a place for his design folio and textbooks
Reliability	B	Michael's desk needs to be strong enough to hold his computer and should contain drawers that can be opened easily
Ergonomics	A	Michael is 1.6 metres tall

Students were required to match the specifications from the given table to the relevant design fundamentals.

Question 1bi.

Marks	0	1	Average
%	11	89	0.9

A concept map:

- assists the designer to consider all aspects related to the product, not just its primary use
- helps to clarify issues and factors that need to be considered
- identifies areas that need to be researched and helps the designer think more laterally prior to designing
- provides different starting points and approaches which can be developed
- explores ideas
- further develops options.

Students were required to give one value of a concept map.

Following is an example of a successful response.

It allows you to explore a range of ideas, materials, and production issues prior to starting.

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Question 1bii.

Marks	0	1	2	3	Average
%	33	16	21	31	1.5

Using a method to weight the criteria in order to assess the design options allows the designer to have a clear idea of what is important to the client. It also allows the designer to have an idea of what they should be considering in their designs and to ensure that they focus on the most important factors for the client, beyond meeting the primary function.

To score marks students had to understand what was meant by 'weight the criteria'. Successful students were then able to respond to the question. The following extract is an example of this.

Allows the designer to have a clear idea what is important to the client. This allows the designer to have an idea what they should be considering in their designs and focusing on the most important factors for the client, beyond meeting the primary function.

Question 1ci–ii.

Marks	0	1	2	3	4	5	Average
%	2	4	12	24	27	31	3.6

Students needed to be aware that the first part of the question asked them to explore Catherine's view only, while the second part of the question was to explore Michael's view. Students then needed to show that they were aware of the importance of aesthetics in design.

1ci.

The aesthetic view of the product is what attracts people to it after they have decided that it meets their needs and function. Catherine's approach is to focus on the aesthetic aspects (look) of the lamp rather than to consider its practical functions.

Following is a successful answer for Catherine's view.

Catherine is a designer who must make a product that not only functions correctly, but also looks pleasing to the eye. People tend to look at the products first and assume that it will function correctly. Hence, Catherine will tend to see the look as the most important factor.

1cii.

The needs and wants of the client are of major importance. The client is the person that has hired you (as the designer); therefore your task is to meet their needs and not the requirements that you think are important.

For Michael's perspective, students had to consider only the client's view as the most important. The following is a successful answer.

The needs and wants of the client (Michael) are of major importance. You are meeting the client's needs not the designer (Catherine) view of what is important. The client has asked for specific needs and they must be the priority for the product.

Question 1d.

Marks	0	1	2	3	Average
%	4	10	34	53	2.4

Three things that Catherine could do if equipment is not available to make the glass dome shape include:

- she can outsource the specific tasks to someone who can make the shape
- she can modify the design after consulting the client
- she can buy something already made
- she can borrow or hire the equipment.

Students were asked to list three things Catherine could do to resolve her difficulty. They were not asked to explain reasons.

Question 1e.

Marks	0	1	Average
%	17	83	0.8

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What Catherine has failed to do could be any one of:

- she failed to research the materials and did not test them
- she did not consider her own limitations and abilities prior to starting and creating the design
- she failed to explore the options as to the most appropriate material for the shape.

Question 1fi–ii.

Marks	0	1	2	3	Average
%	20	8	24	49	2

1fi.

The information Catherine could have collected about Michael could be any one of:

- Michael's likes/dislikes/needs/wants
- Michael's specific needs for his product
- colours
- the size of Michael's room
- the space where Michael's product will be placed.

1fii.

The importance of this information could be any two of:

- clarifies the specific needs of the client
- assists in designing the product to meet the needs of the client, that is, the product will fit on the desk and the correct colours will be used
- gives the designer a sense of the space as to where the product will be placed
- ensures that the product will fit in with the décor of the client's space
- focuses on client satisfaction rather than having a generic object
- helps the designer meet the needs of the client.

Successful students needed to elaborate. Students who tended to use the information already provided did not gain marks. The following is an example of this.

Michael's likes and dislikes

You can focus on Michael's likes you can increase the chance of creating something he appreciates and you will also increase the time you focus on products that he will be successful. There will be less time spent on ideas that Michael does not like.

Question 2a.

Marks	0	1	Average
%	38	62	0.6

Life cycle analysis or life cycle assessment

It was disappointing to see the number of students who did not know what LCA stood for.

Question 2bi–iii.

Marks	0	1	2	3	4	5	6	7	8	Average
%	5	5	9	12	17	16	15	11	10	4.6

Students needed to read the questions carefully to gain full marks.

Question 2bi.

Two issues concerning the problem of disposal included:

- the ability of the product to be dismantled to increase its ability to be recycled
- the non-toxicity of elements in the product so the ability to be recycled is not reduced
- the ability to safely handle the product for disposal – thus it is not a health and safety issue.

Students were asked to list examples concerning the problems of disposal. Students tended to focus on materials even though the question stated that they were to exclude materials. This reduced their ability to gain full marks.

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They then needed to select one issue and provide justification as to why the company needed to consider this issue.

The following is an example of an excellent answer.

If a product cannot be dismantled due to special joining techniques or by making it impossible to separate this will create difficulties for the white good to be dismantled. The user will have no other option but to place the product into landfill.

Question 2bii.

- The company can show that their product can be recycled and dismantled so that the product does not become landfill.
- The product should not be dangerous to the environment or to people due to its toxic elements. The company could be in danger of being sued by health and safety organisations or by individuals who have come into contact with the toxic components.
- The company can show their clients that there is no expense in replacing the product after it has reached the end of its productive life. This will give it a positive image.
- The company can reduce the production costs and therefore keep the price as low as possible.

Question 2biii.

Material choice impacts on product disposal in terms of the ease of recyclability or reuse and how easy it is to break the product down into separate materials. Minimising the range of materials can make recycling cheaper. It may also extend the life of the product.

The final part of the question asked students to explain how material choice impacts on product disposal. Successful students tended to elaborate rather than simply provide a list.

The following is an example of a successful answer.

By selecting materials that can be recycled and by reducing the amount of materials this will allow the materials to be easily separated once the life of the product has been reached. The cost of separating the materials will not be high; hence there is a greater chance the product will not end up as landfill. If the materials are not recyclable and are too difficult to separate then there is a very high chance the product will end up a landfill.

Question 2ci–ii.

Marks	0	1	2	Average
%	18	39	42	1.3

2ci.

The company could reduce the energy used in manufacture in any of the following ways:

- simplify the manufacturing process
- reduce the way the company uses energy in the production of their product
- move to more eco-friendly energy sources
- look at alternative forms of materials and technologies.

2cii.

A benefit of reducing the use of energy in manufacture could be any one of:

- the company can promote themselves as being eco-friendly
- the company can provide information to other companies on how to reduce carbon emissions
- the company can be seen as a leader in the industry
- the company will be seen in a positive light.

Students were asked to provide one way of reducing energy use in manufacturing and a benefit of this reduction. Successful students tended to present issues about manufacturing. The following is an example of this.

Move to more eco friendly energy sources.

The company can promote themselves as being eco friendly

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Question 2d.

Marks	0	1	2	Average
%	17	38	45	1.3

Methods of reducing the impact of transport and distribution could be any two of:

- reduce the weight and size of the product
- do fewer, larger shipments rather than more smaller ones
- transport bulk packages
- sell direct from the warehouse
- redesign packaging to minimise waste
- move to regionalised manufacture.

Weaker students tended to focus on white goods and did not look at transportation and distribution as specified.

The following is an example of successful response.

Use more energy efficient transport, such as electric or hybrid trucks.

Question 3

This question explored the range of production processes, such as mass production, batch production or one-off production. Students needed to understand the benefits and modifications required if moving to batch production.

3a.

Marks	0	1	2	Average
%	12	36	53	1.4

Two advantages of one-off production include any of the following:

- individual, unique, limited edition
- full control over production, design, promotion, distribution
- lower machinery costs, energy costs, material costs.

3b.

Marks	0	1	2	3	Average
%	25	24	27	24	1.5

By buying large quantities of material the company will be able to buy at a cheaper price, as compared to buying small quantities at a more expensive price. This would allow the company to reduce the cost per product to the client and sell more of the product.

3c.

Marks	0	1	2	Average
%	47	22	32	0.9

Instead of handmade joinery and embellishments, she will need to use a machine to speed up production.

3d.

Marks	0	1	2	3	4	Average
%	52	7	12	13	17	1.4

A quality management technique could be any of the following:

- minimise wastage of materials
- ensure that products are checked throughout the stages of production
- reduces the environmental impact due to the disposal of waste
- staff training
- multi-skilling
- maintaining machinery
- employing quality checking staff.

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It was disappointing to see that students are still finding it difficult to understand the role of quality management.

Successful students were able to separate one example of a quality management technique as compared to the whole process of total quality management (TQM). The following is an example of this.

Checking that there are no loose threads at the end of production.

This process would allow the garments to leave the factory looking professional and have a high standard of finish. People would not be critical of the finish and the end users would feel good in them because they do not look cheap and nasty.

Section B, Product 1–6

Product selected	None	Cubby house	Storage/display unit	Beach party outfit	Set of containers	Mobile	Child's garden set
%	1	29	32	33	2	1	2

Question 4ai–ii.

Marks	0	1	2	3	Average
%	4	16	35	45	2.2

Students had no difficulties with this section and generally the responses were appropriate.

4ai.

Responses to why it is important to develop evaluation criteria before designing the product could include:

- to ensure that all specifications of the client have been addressed
- to use as reference points during the design process
- to ensure that the client's needs are met
- to clarify needs/wants.

Following is an example of a successful response.

To ensure all specifications of the client have been addressed and to make sure that they are evaluated at the end of product.

Are the fasteners on the product able to be easily opened by an eight year old child?

4aai.

Students were required to develop one evaluation criteria to evaluate the product. Following are examples of evaluation criteria.

Are the fasteners...

Will the product be able to display a range of toy cars?

Question 4bi–iii.

Marks	0	1	2	3	4	5	6	Average
%	12	3	10	15	17	16	27	3.8

Students had great difficulty with this section and there was an indication that they had either not done testing within their own production or that they had not considered the role of testing prior to starting the product. Too often the testing was done after the product had been finished and students were then unable to make changes if errors had occurred. The role of testing is to reduce the chance of errors.

4bi.

One test could be:

- the materials are durable
- the joints are neat and even (visual test)
- there is an appropriate standard of finish

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4bii.

The stage at which this test would be conducted included:

- before production
- during production
- after production.

4biii.

The test is important:

- to make sure that the material has the appropriate properties to perform its required function
- to make sure the standard of construction is consistent and of a good standard
- to ensure the client is getting a quality product to an expected standard of finish.

The following are examples of successful student responses.

Example 1

I would test whether the colours chosen would fade in the sun

Prior to making the product and when selecting the fabric

If the dress will be worn during summer and you need to make sure that the colours do not fade in the sun. It is important because you would like to be able to wear the dress more than once and you do not want a product that cannot sustain sunlight.

Example 2

I would test whether the joint on the display cabinet will not become loose.

Prior to making the product

The joint needs to support other timbers and it needs to be able to withstand bumping and a range of movements. It is important that the right joint is selected so that the display unit does not fall apart or become loose due to the incorrect use of joints.

Question 5

Annotated design option

Function/Suitability for intended use

Marks	0	1	2	3	Average
%	4	17	40	40	2.2

Age-appropriate appeal

Marks	0	1	2	3	Average
%	5	17	36	42	2.2

Clarity and detail of drawing

Marks	0	1	2	3	Average
%	2	23	47	27	2

Details of construction

Marks	0	1	2	3	Average
%	17	25	26	31	1.7

Safety considerations

Marks	0	1	2	3	Average
%	25	35	27	13	1.3

Innovation and creativity

Marks	0	1	2	3	Average
%	10	35	35	19	1.7

Students were able to successfully complete this section without any significant difficulties. However, students tended not to annotate information even though they were asked to do so. This was particularly obvious in the construction and safety sections. If information was not provided, students could not gain full marks.

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Question 6

Marks	0	1	2	3	4	Average
%	13	14	30	22	21	2.3

Students are still trying to develop the ability to articulate their products using appropriate language within the visual, tactile and aesthetic design factors. Some students were able to do this with some success.

The following is an example of a student response where the student made a display unit for toy cars that looked like a car.

Fundamental	<i>Shape</i>
Application	<i>Balance</i>

The shape of the display unit reflects a car because it will hold toy cars. This will allow the clients to have a product that will give an idea to people looking at it what is inside. Balance is created by having a wheel on each side and the two doors of equal size opening up to display the cars inside.

Question 7

Marks	0	1	2	3	Average
%	25	29	25	21	1.4

The product needed to be safe for children and there are set requirements for products used and worn by children. Children are different to adults in size and body shape. The standards should be used to make sure that children are able to use the product safely.

Students found this question difficult to answer. They tended to explain what the Australian standards were rather than how they might be applied or used for their products.

The following is a successful response that discussed a cubby house.

To make sure the materials I have used have been tested and therefore meet the requirements to hold weight and pressure. I do not want the cubby house to collapse and I want to make sure that my client feels safe that the cubby house meets a certain standard of safety.

Question 8a.

Marks	0	1	Average
%	35	65	0.7

Complex processes include:

- routing
- zip application
- sleeve insertion
- overlocking.

Students needed to distinguish between a complex process and simple process. Some students were unclear of the difference. A general view is that a complex process requires careful planning and accuracy, and is difficult to execute, often requiring a good to high level of manual dexterity and competence. Cutting timber with a saw is not a complex process, but using a jig saw to cut an intricate design was an acceptable answer. Sewing was not an acceptable answer but embroidery was considered an acceptable response.

Question 8bi–iii.

Marks	0	1	2	3	Average
%	21	6	23	50	2

8bi.

A hazard could be:

- a spinning blade that could cause personal injury
- the overlocker needles that could pierce the skin.

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8bii.

Potential injuries include cut or pierced hand or fingers

8biii.

A risk control measure could be to ensure that work is clamped properly. Have machine unplugged when setting up.

Students found this area quite easy and the marks indicate that they are aware of the risk assessment process.

The following is an example of a successful response.

The needle may injury the user

The user may have the needle pierce their finger while sewing.

Correct training of the use of the sewing machine.

Question 9

Marks	0	1	2	Average
%	13	26	60	1.5

The instruction for the care of a product could be to wipe the table with a damp cloth or wood cleaner once a week to remove dust.

Two marks were awarded for good instructions. One mark was given for 'hand wash' or 'regular clean'. No marks were awarded for 'wash' or 'clean'.

Students were able to answer this question easily.

The following is an example of a simple answer.

The cubby needs to be painted once every two years to protect the timber.

The dress need to use steam setting when ironed.

Question 10a.

Marks	0	1	2	3	Average
%	22	24	30	23	1.6

- Yes, because the client group has a high disposable income so they will be selective about finding products which are unique. They will have access to the Internet and will be keen to use the Internet to buy products. The client group are busy people and it will save them spending time searching for products.
- No, because the client group are not necessarily computer literate and therefore they might not want to buy products from the Internet. They cannot easily see what the product looks like and cannot access the size and feel of the product by seeing an image on the Internet.

Students were required to discuss whether newgeneration.com had chosen the right method of selling their products. Students found this question difficult due to the fact that the Internet site was for parents and grandparents, and not necessarily aimed at children. Students' responses should have been mainly related to the parents or grandparents.

The following is an example of a successful answer.

No because grandparents and parents will not necessarily just look at a product on the internet and buy the product. They may wish to see how big it is or feel the materials. This is difficult to do just by looking at an image on a computer.

Question 10b.

Marks	0	1	2	Average
%	16	27	58	1.4

Ways of creating an awareness of the website to the target group include:

- they would be required to do specific advertising, such as in magazines or on the radio

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- they could target a specific group by advertising on the Internet or by placing links on webpages that provide information about children.

Successful students did not simply list ways in which awareness of the Internet could be increased but gave some reason for their answer.

The following is an example of a successful student response.

They may wish to have pamphlets in child care centre because parents and grand parents regularly visit such sites and they can easily pick one up rather than trying to write the web address down.