

Examiners' Report
June 2014

GCSE Design & Technology 5GR02 01

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Introduction

The format and structure of this question paper is now well established, it is clear that teachers and candidates are familiar with the layout and have used past papers and previous examiners' reports during preparations for this examination.

On the whole candidate performance is improving on the two questions that assess QWC (Quality of Written Communication) by providing answers that have more structure.

Candidates' level of response to the *describe* and *explain* type questions is showing improvement.

Compared to last year the multiple choice section at the start of the paper was well answered although there was evidence of candidates not selecting a response for one or more of the questions. For this section candidates are strongly encouraged, even if they are unsure, to select an answer.

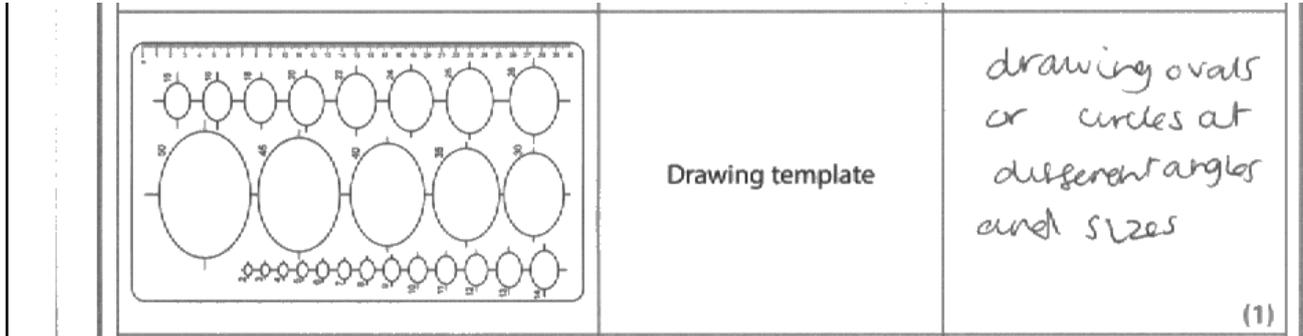
Centres are asked to remind candidates the space made available for giving the answer has been specifically designed for how much writing is needed to gain maximum marks.

Question 11 (a) (i)

A lead in question to give candidates confidence and as expected all students recognised and identified a ruler or a rule.

Question 11 (a) (ii)

Most candidates recognised this template as an aid to drawing but were less accurate in describing the type of template, often stating circles or shapes. Ideal answer is an ellipse template but isometric circles or ovals were accepted for 1 mark.



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Examiner Comments

If a candidate provides several answers in a name/ give type question the examiner will only credit the first response.

In this answer the response attained 1 mark since ovals was written before circles.



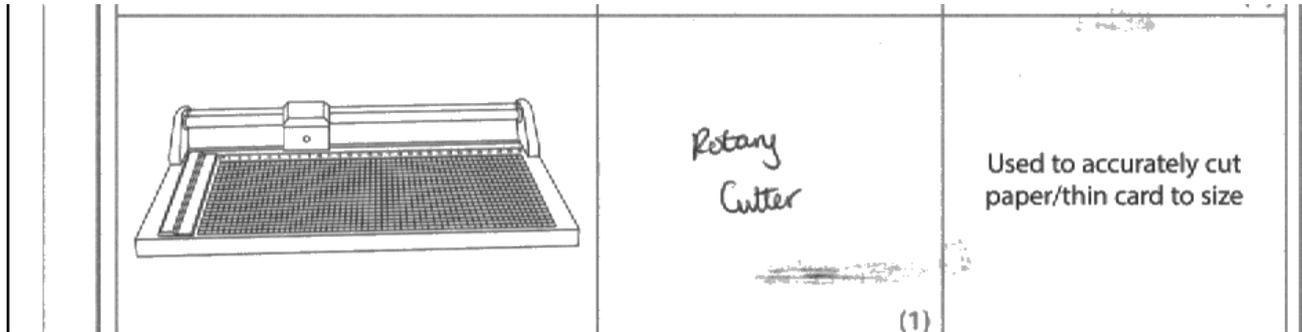
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Examiner Tip

Avoid writing alternatives in your answers.

Question 11 (a) (iii)

The majority of candidates, with a huge variation in spelling, answered with guillotine. This was rewarded with 1 mark even though technically a rotary cutter has a different action for cutting paper/card.



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Examiner Comments

The Key word for this question was cutter and associated words that implied the action of cutting, e.g. trimmer.



ResultsPlus

Examiner Tip

If possible make notes with pictures of all the tools and equipment you use throughout the course. This can be used as a revision aid before the exam.

Question 11 (a) (iv)

Nearly all candidates were familiar with a drawing board gaining 1 mark.

Question 11 (b) (i)

Candidates responded fairly well to this question, describing suitable properties of rigid polystyrene sheets. However it is clear from their responses that students need to take their answers one further step in order to evidence their knowledge and understanding, especially the relationship between moulding and heating.

(i) Give **two** properties that make rigid polystyrene sheets suitable for vacuum forming.

(2)

1. malleable when heated

2. stays rigid when ~~cool~~ cold.



ResultsPlus Examiner Comments

This answer correctly identified, two properties, when placed under specific conditions, for the full 2 marks.

Although the property rigid is mentioned in the stem (question) an award of 1 mark was given for identifying it is rigid "when cool".



ResultsPlus Examiner Tip

When possible avoid repeating terms used in the question as your answer.

Question 11 (b) (ii)

Candidates' knowledge and understanding of transferring graphic designs to the mobile phone was evidenced across a range of techniques with screen printing stated on many occasions. However, many candidates only gave one correct response.

The question is starting to "ramp-up" in difficulty by asking for two examples of applying a graphic. Most candidates could only recall one method.

(ii) Name **two** suitable methods that could be used to transfer the graphic designs onto the phone.

(2)

1 Vinyl stickers

2 Screen printing



ResultsPlus

Examiner Comments

This answer identified two methods of applying a graphic onto the model phone for the full 2 marks.

A few candidates incorrectly responded with "blue tooth", "WiFi", gravure, or flexography by misreading the question and taking it out of context.



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Examiner Tip

Read the Question carefully to ensure you answer is in context and is appropriate for the application.

Question 11 (c)

Candidates who responded well to this question gave valid explanations for both 'smooth' and 'draft angle', but many did not advance their responses to the next step explaining how the product benefits i.e. smooth appearance on product sides or no breakage to product during removal.

Some candidates confused the mould with the moulding and explained the benefits of being able to remove the product easily from its packaging due to its smoothness.

(c) Explain why the sides of a vacuum-forming mould should be smooth and with a slight angle (known as a Draft angle). (2)

So that the mould can be easily removed from the product, rather than it getting stuck or doing damage to the product during removal.



ResultsPlus
Examiner Comments

There were two opportunities to gain full marks, as the examples here show.

The second example for full marks.

(c) Explain why the sides of a vacuum-forming mould should be smooth and with a slight angle (known as a Draft angle). (2)

They must be smooth so the end product is of a high standard and at a slight angle so it can be released and manipulated easily.



ResultsPlus
Examiner Comments

Marks are awarded for smooth so end product is of a high standard.

Question 11 (d)

Many candidates again confused the mould with the moulding and stated properties of the sheet material required for vacuum forming instead of the mould. Where candidate responses gained credit they were able to give a range of suitable requirements for the mould material, especially in relation to heat.

(d) List **three** properties that a material must have to make it suitable for making a vacuum-forming mould.

(3)

- 1 Excellent heat resistance
- 2 Be able to be carved and filed to have a smooth surface
- 3 Be ~~not~~ rigid and durable to extremely hot plastic



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Examiner Comments

A well answered question for the full 3 marks.

Question 11 (e)

Many candidates responded well to this question, often stating and describing 3D Printing with fewer responses giving the key term, rapid prototyping or layers. Candidates also gave suitable responses relating to 3D CAD models, but many simply stated CAD without explanation.

(e) Describe an alternative method of producing a model of a mobile phone using ICT.

(2)

Rapid prototyping: 3D printing in which a design is built up using many many layers of material crafted by a computer controlled robot



ResultsPlus
Examiner Comments

Full answer that demonstrated a good knowledge of using IT for modelling.

Question 11 (f)

Candidates responded well to this question, often explaining the fast production rates available with injection moulding. Candidates were able to explain the advantages of this process across a range of reasons, but would limit their responses to 1 mark - especially cost effectiveness by not taking the next step and explaining why in relation to 24/7 production.

The explain type questions requires two parts, a point and an explanation or reason.

(f) Explain **two** advantages of injection moulding when mass producing mobile phones. (4)

1. accurate products everytime

2. fast process of making.



ResultsPlus Examiner Comments

This answer here makes two awardable points but misses out by not attempting an explanation.



ResultsPlus Examiner Tip

Using words or phrases such as "therefore" and "which means" will automatically lead you onto explaining the point you made.

(f) Explain **two** advantages of injection moulding when mass producing mobile phones. (4)

1. The process is fast, this means a lower number of items can be made in a given time (increasing ^{per sec})

2. The process can be completely automated. This means less people need to be employed.



ResultsPlus Examiner Comments

A well answered question gaining the full 4 marks.



ResultsPlus Examiner Tip

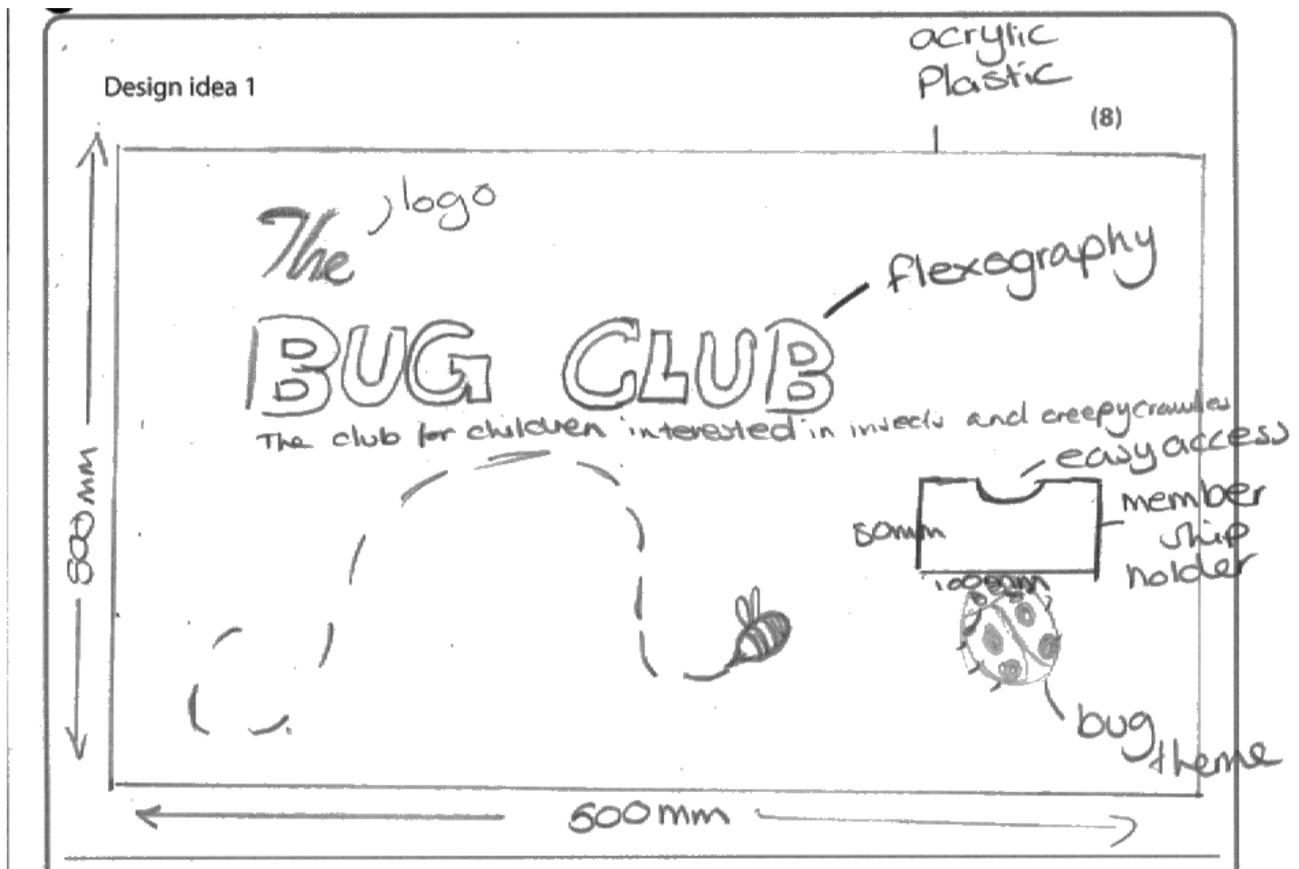
Here the link phrase used is "this means".

Question 12

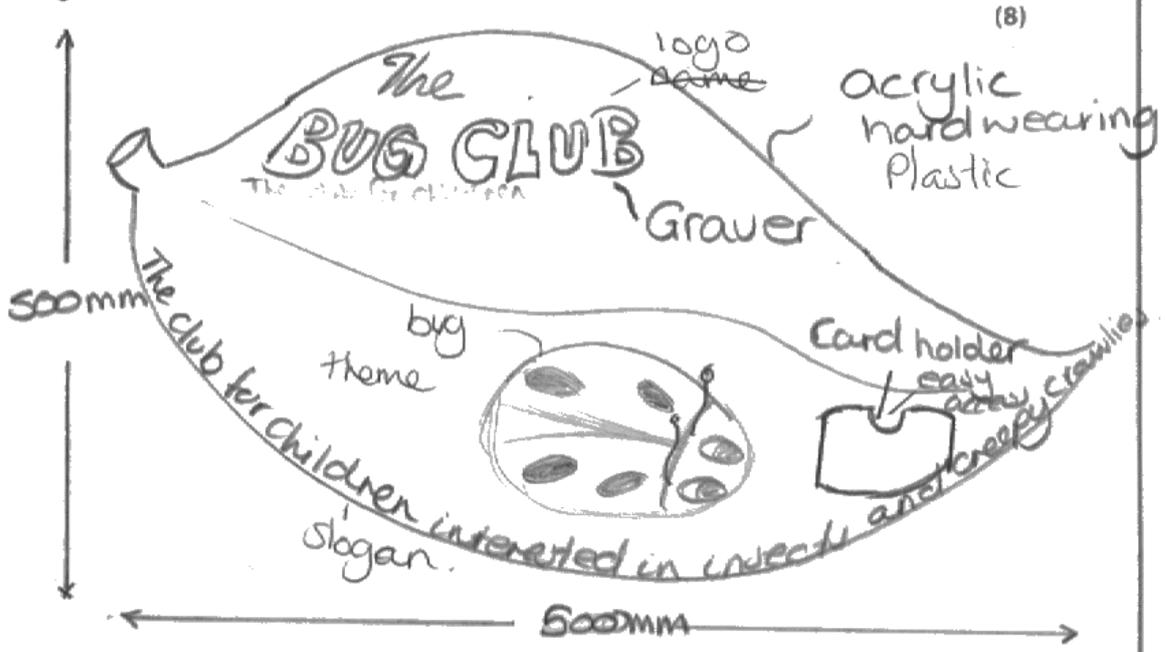
The vast majority of candidates attempted this question with very few blank pages. Most candidates showed a lot of imagination displaying some creative and well-presented design ideas but many struggled to design to a specification and as a result were only able to access mid-range marks.

Candidates mainly found difficulty in demonstrating how to hold at least 20 membership cards, naming a specific material rather than wood or plastic and incorrectly matching manufacturing processes with identified material, e.g. strip heater for bending MDF! This was often compounded with poor communication skills, where written notes were difficult to read from poor hand writing.

Not so obvious candidates also lost marks due to lack of detail and repetition in the second design, where in many cases, they did not offer alternative materials, manufacturing or printing methods and simply noted identical solutions.



Design idea 2



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Examiner Comments

Two imaginative and well-drawn designs that has not addressed all the specification points and as a consequence only achieved half marks. The second design was mostly a repeat of the first design and only awarded 1 mark for "bug theme".

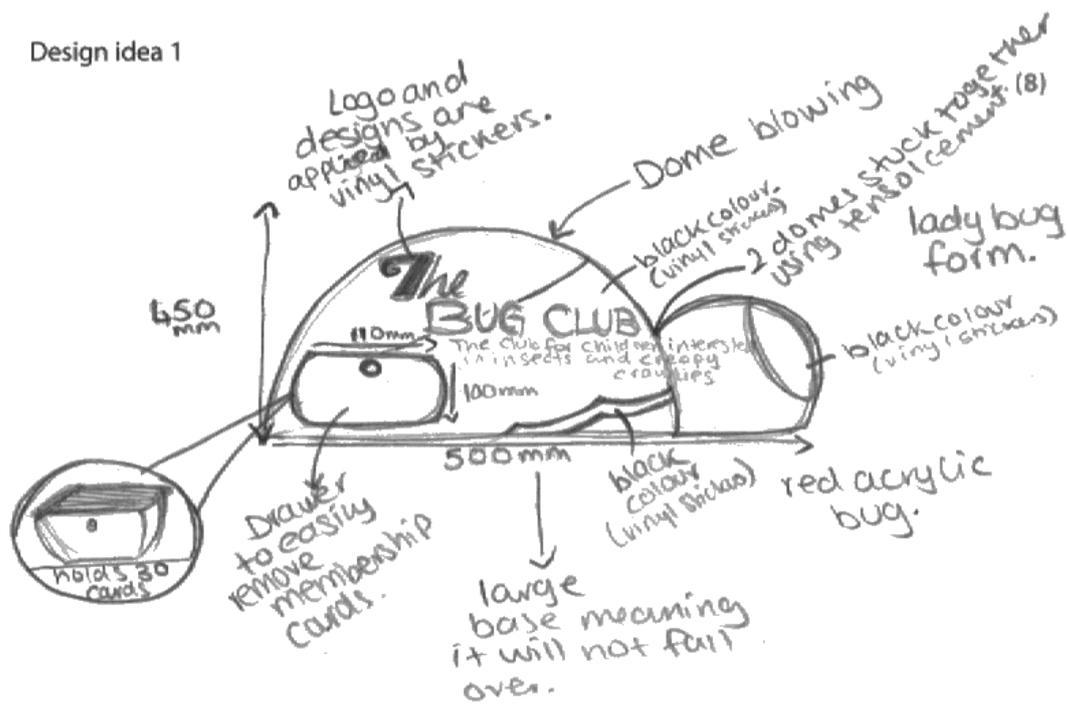


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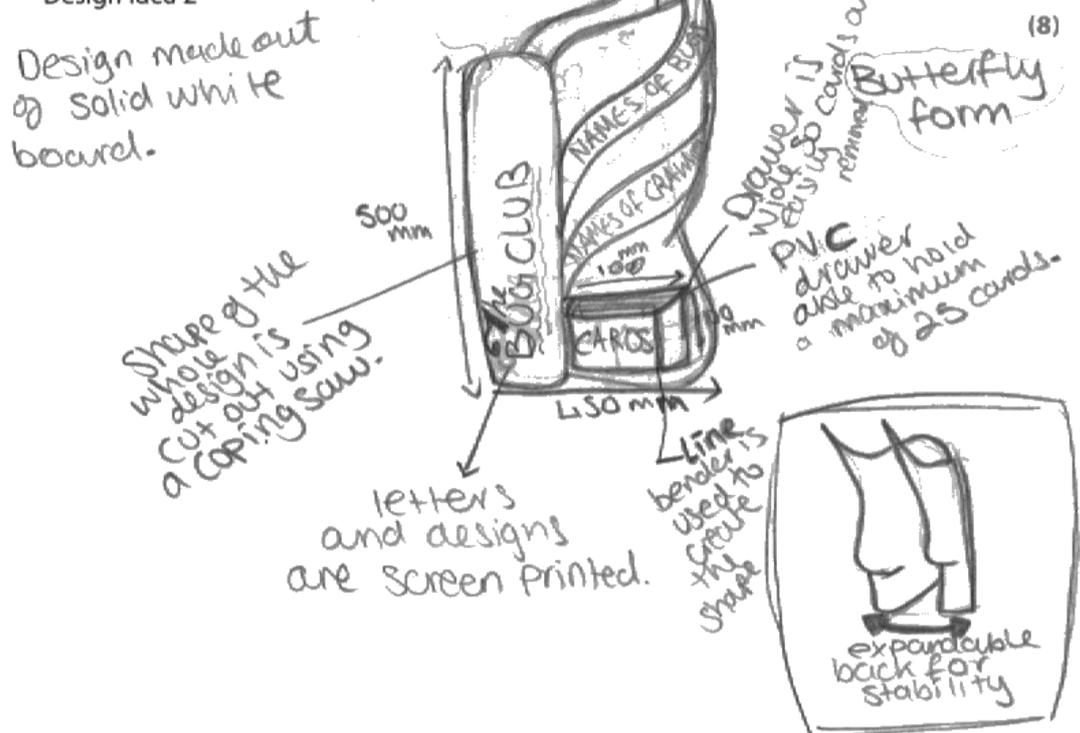
Examiner Tip

Ensure your two designs are completely different so the materials and method used to achieve each specification point in the 1st design is not used in the 2nd design.

Design idea 1



Design idea 2



(Total for Question 12 - 16 marks)



ResultsPlus

Examiner Comments

A much better attempt at addressing all the specification points in this answer gaining an overall 12 marks.

Question 13 (a)

Candidates were often unable to give specific and valid properties of PET which makes it suitable as a fizzy drinks bottle. Those responses which did not gain credit for "Property", mostly gave written detail regarding "Justification" instead. Candidates who gained credit for a valid property mostly stated lightweight, impact resistant and transparent, with few candidates stating plasticity, non-porous and inert. Where candidates did state the required specific terminology for one of the properties, e.g. impact resistance, they were mostly gained further credit via their knowledge and understanding of the ability for the material to absorb shock and not break/damage the contents.

(a) Give **two** properties of PET that make it a suitable material for a fizzy drinks bottle.
For each property, justify your answer. (4)

Property 1
Transparent
Justification
the product (drink) inside is clearly visible

Property 2
light weight
Justification
This makes the bottle more user friendly (easier to pick up and hold)



ResultsPlus
Examiner Comments

This answer had a sufficient amount of information to gain the full 4 marks.

(a) Give **two** properties of PET that make it a suitable material for a fizzy drinks bottle.

For each property, justify your answer.

(4)

Property 1

lightweight

Justification

easy to carry

Property 2

cheap

Justification

cheap to produce .



ResultsPlus
Examiner Comments

Cheap is a generic term and always needs to be qualified.



ResultsPlus
Examiner Tip

Instead of "cheap to produce" use "low unit cost when mass produced in large quantities".

Question 13 (b)

Responses showed understanding of how thermo-chromic liquid crystals react to temperature by changing colour. Candidates were able to explain how this material could be applied to fizzy drinks bottles. It was clear that some candidates did not know the properties of this material, but some gained credit via their response in regard to printing/aesthetics.

(b) Explain **one** advantage of using thermochromic liquid crystals on the label of the bottle.

(2)

change colour dependent on
content temperature



ResultsPlus

Examiner Comments

The key words for this question are "colour" and "temperature" which is provided in this answer gaining the full 2 marks.

(b) Explain **one** advantage of using thermochromic liquid crystals on the label of the bottle.

(2)

They will change colour when the temperature changes
which is attractive for customers



ResultsPlus

Examiner Comments

This answer includes a customer reaction, but no extra credit is given since the question only asks for one advantage.

Question 13 (c) (i)

Many candidates gained credit for their responses to this question, showing good understanding of how the low weight of plastic bottles reduces fuel costs. Candidate responses also reasoned how many more products can be transported on one vehicle. Fewer candidates explained the robust nature of plastic bottles leading to fewer breakages.

(c) Explain why plastic bottles are successful at meeting the following specification points.

(i) Reducing transportation costs

(2)

They reduce to transport costs as they are light weight which means more bottles can be carried in a certain amount of time to the same place without making several trips.



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Examiner Comments

Very wordy answer which eventually gets to the point to achieve the full 2 marks.



ResultsPlus

Examiner Tip

Avoid re-writing the question in your answer.

(c) Explain why plastic bottles are successful at meeting the following specification points.

(i) Reducing transportation costs

(2)

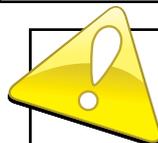
They are lightweight so more can be transported at a time



ResultsPlus

Examiner Comments

This answer achieved the same 2 full marks as the previous example without the "padding".



ResultsPlus

Examiner Tip

Be concise in your answer avoiding unnecessary words.

Question 13 (c) (ii)

Many responses showed little understanding of how plastic bottles can be moulded to have ribbed/textured caps for "grip" allowing easy opening, simply stating that it's easy to open just turn the screw cap or just explaining the cap has screw thread, which in itself is insufficient to be awarded a mark without identifying that a double helix is used to release pressure to allow for easy removal of the cap.

(ii) Allowing the bottle to be easily opened (2)

They have a ~~screw thread~~ on top of indents in the lid so that the user can get a grip of lid in order to turn it to take it off.



ResultsPlus
Examiner Comments

The key word is "grip" and how that is achieved.

(ii) Allowing the bottle to be easily opened (2)

The plastic screw cap enables easy access



ResultsPlus
Examiner Comments

Questions get more difficult towards the end of the exam paper and require higher level answers.



ResultsPlus
Examiner Tip

Carefully consider your response especially if the answer seems obvious.

Question 13 (d)

Some candidates were very well prepared and had been well briefed on this type of question and provided some excellent, very detailed and well written answers. A large number however gave only generalised responses offering minimal detail and lacked the use of technical terminology. In terms of user requirements most just identified the method for opening and the subsequent ability to reseal or not. In terms of environmental issues most just identified that both have the ability to be recycled.

Where many candidates lost marks was in simply not offering justifications for the points they were discussing but simply offering a relevant point without explanation. Short statements without qualification were common. The candidates using a table showing advantages/disadvantages of the can/bottle in a comparative way, wrote answers that tended to lack detail or depth. Quite a few candidates drifted away from references to environmental impact or user requirements and simply discussed the merits of the design of the can/bottle and offered much information regarding the sourcing of the raw materials for aluminium or PET.

Marks are awarded for the "quality of written communication" (QWC) which requires appropriate use of technical terms in a coherent and concise way and the space required is sufficient enough to achieve the highest level.

Evaluate container A with container B in terms of **user requirements** and **environmental impact**.

	Container A	Container B ⁽⁶⁾
User Requirements	<ul style="list-style-type: none"> Once opened cannot be resealed Sharp once opened, can be dangerous 	<ul style="list-style-type: none"> Can be resealed Holds more liquid
Environmental impact	<ul style="list-style-type: none"> Can be crushed, so it won't take up much room One piece, no caps to worry about 	<ul style="list-style-type: none"> Easy Recyclable Cap can be lost, this is littering Can be resealed



ResultsPlus Examiner Comments

Using tables, grids, and even bullet points will often be a disadvantage in this type of question.



ResultsPlus Examiner Tip

Avoid using a tabulated format in this type of question.

Evaluate container A with container B in terms of **user requirements** and **environmental impact**.

(6)

The main difference between the two usability wise is the practicality of the opening methods. The screw on cap ^{of B} can easily be taken on and off with little pressure, whereas the ring pull method of A has to be held and 'jiggled' with. Container B is made of plastic, which is sustainable since it can be reused in another product when recycled.



ResultsPlus
Examiners' Comments

This answer started well and seemed to run out of time as it just stops.



ResultsPlus
Examiner Tip

The space is an indication on how much you should write.

Evaluate container A with container B in terms of **user requirements** and **environmental impact**.

(6)

Container B can be re-closed whereas container A cannot because it has a ring pull. This means container A cannot be put in a bag or transported as easily ^{as container B can} once open. Container B appears more ergonomically designed than container A perhaps making it easier to ^{hold and} open. Container B can also be reused because of the screw on cap which enables the container to be reused, ~~the~~ and refilled with drink so ~~the~~ ^{bottles} not as many ^{of container B} will be disposed of than ^{containers} container A. Both the metal currently used for container A, usually ~~the~~ steel or aluminium with a tin coating, and the plastics used in container B, for example PET, can be recycled ~~regularly~~ in the UK. This means they both try to reduce environmental impact.



ResultsPlus
Examiners' Comments

This answer is much better attempt by providing several points and some explanation on some of those points. With a little more explanation of recycling minus the repetition in the middle of the text a higher level mark would have been awarded.



ResultsPlus
Examiner Tip

This type of question takes practice to be able to achieve the high level marks.

Question 14 (a)

Students were given credit mainly due to their general understanding of being able to edit designs, but did not extend their responses to involve client feedback. Students did not give many responses relating to specific editing tools. Many students neglected to incorporate the need for client involvement in their responses. Students also gained credit by explaining the ability to email designs/save designs to disk, but neglected to take the next step and explain the benefit of being able to do this.

(a) Explain **two** advantages of using DTP when designing greeting cards.

(4)

- 1 They can be manipulated according to the design - easily adjustable
- 2 They can be sent via the internet through e-mail.



ResultsPlus

Examiner Comments

Both statements are true but missed out on marks as no explanation was given.



ResultsPlus

Examiner Tip

As with all describe/explain questions use linking words or phrases.

(a) Explain **two** advantages of using DTP when designing greeting cards.

(4)

- 1 The designs can be quickly changed to meet the customer's needs
- 2 ~~Can~~ Designs can be sent to other designers to be edited collaboratively And then produced exactly



ResultsPlus

Examiner Comments

The linking phrases used here are "to meet" and "to be edited".

Question 14 (b)

Students responded well to this question and were able to describe health and safety issues relating to computer use. However, many students did not link the cause of back/neck strain to office equipment they would be sitting on. Students also described the need not to have food or drink at the computer which gained no credit.

(b) Describe **one** health and safety issue that must be considered when working at a computer.

(2)

Strain on eyes ^{must be} ~~or it can be~~ considered when working at a computer
due to looking at a bright screen for long periods of time.



ResultsPlus

Examiner Comments

Once again a wordy answer that eventually gains the full 2 marks.

(b) Describe **one** health and safety issue that must be considered when working at a computer.

(2)

Staring at a computer screen for a long time can
cause eye strain leading to headaches.



ResultsPlus

Examiner Comments

A better answer giving the cause and effect for the full 2 marks.

Question 14 (c)

Many students responded well to this question and were able to explain the range of enhancements EPDs give. Where students did not know this electronic device, they gained credit by linking their responses to improved quality.

(c) Explain how electronic paper displays (EPDs) could be used to enhance the appearance of a greeting card.

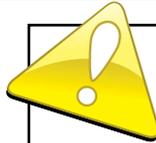
(2)

They could provide changing displays on the greetings card which appeals to the target market.



ResultsPlus
Examiner Comments

This answer has two distinct parts to be awarded the full 2 marks.



ResultsPlus
Examiner Tip

The link word here is "which".

(c) Explain how electronic paper displays (EPDs) could be used to enhance the appearance of a greeting card.

(2)

It would allow for animations to be incorporated into the design.



ResultsPlus
Examiner Comments

A good point made but no mention of the benefit/effect that loses a mark.

Question 14 (d)

Lots of candidates did not attempt this question. Where candidates did attempt the question their understanding of the Gravure printing process was vague.

Only a few answered it very well but most candidates produced confused or incomplete responses often describing another printing method.

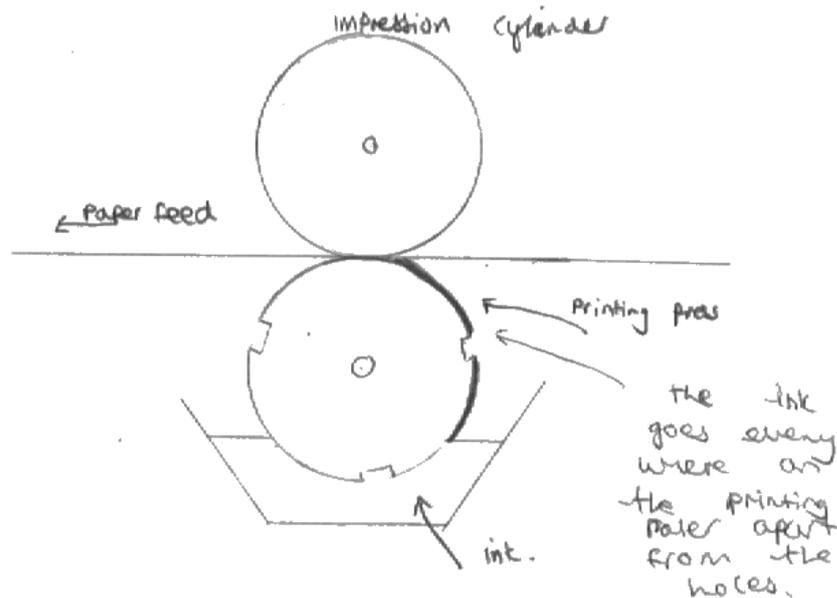
Very few answers gained full marks.

Sketches of the process were generally poor but where candidates did gain marks it was predominantly from their diagrams rather than a detailed description.

(d) The gravure printing process is to be used for the commercial printing of the greeting cards.

Using notes and sketches describe the gravure printing process.

(5)



There is different inks used in gravure, Cyan, Magenta, black and yellow. each colour has a different roller system.



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Examiner Comments

The basic diagram was correct but only managed to gain 3 marks as the annotation was either incorrect or lacked enough detail to gain any further credit.

Question 14 (e)

A very well answered question with the vast majority of candidates gaining some marks. This was an area most candidates were familiar with and could offer some input into describing some advantages/ disadvantages of sending electronic greetings cards and to use technical terminology. However, as in recent years, poor quality written communication means deciphering written answers makes it difficult to award the marks the answer deserves.

As with Q13d tabulated answers tended to lack detail or depth. Centres must be advising candidates to present their answers in this way should also advise that developing relevant points is essential to achieving high marks.

* (e) Discuss the advantages and disadvantages of using the internet to send electronic greeting cards.

(6)

A large advantage of using the internet is that they instantly arrive at the inbox of the person you have sent the card to, whereas with physical ones, there's an uncertainty as to whether they'll arrive on time or have got lost, etc. Another advantage being that they can sometimes be interactive (depending on which one the sender has chosen), which means they include moving pictures and audio - increasing the entertainment value. However, one could argue that they don't have the charm of traditional greetings cards, thus making them seem less appealing. An additional disadvantage being that sometimes, errors can be encountered with email providers, causing messages to not arrive or spontaneously delete of their own accord.

(Total for Question 14 = 19 marks)



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Examiner Comments

This answer is good attempt and is awarded 4 marks.



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Examiner Tip

Avoid using the abbreviation "etc" in your answers.

Paper Summary

Based on their performance on this paper, candidates are offered the following advice:

- Describe/explain type questions - candidates must support their answers in order to access the full marks available and are advised to practise using linking words or phrases.
- Candidates should pay more attention to the questions that assess Quality of Written Communication (QWC) and learn to be concise with their answers.
- There is enough space provided in the question paper for your answers, should you need more space additional sheets can be attached with treasury tags.
- Avoid using words from the stem (question) in your answer.
- Prepare for the exam by revising the whole specification.

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