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Examiners' Report

June 2011

GCSE Design & Technology: Product
Design 6RM03 01

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Introduction

The general response of candidates to the paper this year has been quite impressive. Candidates have largely written full responses to the majority of questions on the paper which shows a widespread knowledge, with many also providing depth in their answers. Clearly the whole specification has been delivered to candidates effectively allowing a significant number to score highly. It is also encouraging to see evidence of good examination techniques being applied which have allowed candidates to focus their answers and quickly gain marks in responses without going off at a tangent. Having said this, there remains the minority who score poorly on some questions due to not reading questions carefully or structuring their answers accordingly. Some examples of this have been deliberately selected in this report in order to highlight the issues. I would recommend that they are used in the classroom with candidates to highlight these issues which are all too common.

Question 1 (a)

A straight forward introductory question in which most candidates scored full marks. The common mistakes are illustrated in the examples below.

Answer ALL the questions. Write your answers in the spaces provided.

1 Electronic communication is an essential element of modern business practice.

(a) Give **three** advantages to a business of using email compared with telephone communication systems. (3)

1 Documents may be attached to an email so ~~documents~~^{images}, letters ect may be shared quickly

2 Can be sent to multiple individuals at the same time

3 less time consuming than making loads of phone calls



ResultsPlus Examiner Comments

The first two points are clear valid responses, although the third is simply an explanation of the second response rather than a separate advantage. A number of candidates repeated responses like this simply using different words and failed to gain marks.



ResultsPlus Examiner Tip

Re-read responses carefully checking for repeats.

Answer ALL the questions. Write your answers in the spaces provided.

- 1 Electronic communication is an essential element of modern business practice.
- (a) Give **three** advantages to a business of using email compared with telephone communication systems.

- 1 Emails are free providing you have an internet connection (3)
- 2 Emails send very fast
- 3 Emails can be sent from anywhere, to anywhere in the world.



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Examiner Comments

The first candidate response is valid but the two following were the most common mistakes. The question compares the use of emails to telephone calls. Telephone calls are also connected very fast, and similarly there are few places with internet availability that do not also have telephone connectivity.

Question 1 (b)

The candidates in most cases tackled the question well, and gained good marks from a wide range of responses. The question differentiated effectively as weaker responses only identified two or three benefits. Having said this it was good to see candidates having a go and not leaving responses blank when their knowledge ran dry.

(b) Describe **four** benefits to a business of using the internet as a marketing tool. (4)

- 1 It will reach a huge potential market.
- 2 Cost efficient as no paper printing is involved
- 3 can have updates at any point of the marketing
- 4 Permission does not need to be granted to show products, as does need to for postal



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Examiner Comments

Three good responses and a guess. It is good to see candidates having a go rather than leaving responses blank.

(b) Describe **four** benefits to a business of using the internet as a marketing tool.

(4)

- 1 Competition can be observed and analysed using the internet
- 2 Adverts can be put on big and famous (regularly used) websites like email servers or search engines
- 3 Business can set up their own website to link the internet to just in time systems so that any orders placed via internet are immediately processed
- 4 Use of Internet advantages like Email, videoconferencing or electronic data interchange to communicate and transfer files easily and quickly



ResultsPlus Examiner Comments

An example of a misinterpreted question. The candidate has given the benefits of using the internet for market research rather than marketing. A mark was awarded for response 3 as this was relevant to the question.



ResultsPlus Examiner Tip

Candidates must read questions carefully. I recommend underlining/highlighting the key words to help focus the response.

Question 2 (a)

Not as well answered as it might have been. Many responses correctly identified properties that were improved by the additive, although many failed to explain the improvement. The most common mistake was to simply state the improvement again within a context.

2 (a) Choose **two** of the following additives and explain how they improve the properties of polymers.

- Fibres
- Stabilisers
- Foamants

Additive 1 Fibres

(4)

Allows a huge amount of strenght to be added to the polomer whilst also allowing a certain degree of flex if needed

Additive 2 Stabilisers

Sets the material to a strong state if needed can solidify in certain environments



ResultsPlus Examiner Comments

The response identifies an improved property, but rather than explaining this improvement the candidate identifies a second property. Only one mark is awarded here as the question requires an explanation.

The second response is incorrect.



ResultsPlus Examiner Tip

The command words need to be carefully reinforced for candidates so that they can structure their responses appropriately.

2 (a) Choose **two** of the following additives and explain how they improve the properties of polymers.

- Fibres
- Stabilisers
- Foamants

Additive 1 Fibres.

(4)

• Adding fibres to polymers increases their structural rigidity, allowing them to be used in high stress situations.

• Adding fibres to polymers makes them shatter resistant due to their webbed structure.

Additive 2 Stabilisers.

• Adding light stabilisers increase the resistance to the degrading effect of UV light upon polymers, increasing their life span.



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Examiner Comments

Two clear improved properties identified with valid explanations. A good response.

Question 2 (b)

The vast majority of candidates correctly stated that Biopol will biodegrade and followed this with a clear explanation. Second responses were a lot more variable. All areas of the mark scheme were used but many failed to give clear explanations.

(b) Explain **two** advantages to the environment of using Biopol® in products. (4)

1. Biopol is a 100% biodegradable polymer that will break down in the environment.

2. It won't leave any harmful chemical in the environment to damage the ecosystem.



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Examiner Comments

The candidate has stated that it is biodegradable and said what this means but has not explained why this is an advantage.

The second response has an explanation, but no point has been made.

The two responses could be linked together and seen as one point with its advantage explained.



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Examiner Tip

Candidates should try to justify their reasons for choosing a particular fieldwork method or approach. This avoids the 'we did this'-type answer.

(b) Explain **two** advantages to the environment of using Biopol[®] in products.

(4)

1. Biopol is extracted from a fermentation process of carbohydrates and glucose - this means it comes from a renewable energy source hence reducing demand on finite resources.
2. Biopol is fully biodegradable so can be composted or thrown in landfill & will decay when exposed to micro-organisms found in these places. This also means less demand on landfill sites and no ~~harmful~~ by-products harmful.



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Examiner Comments

A very thorough response with two clear explained points. Although the responses have not used the same explanations that are next to the points in the mark scheme they are valid explanations and are awarded marks.

Question 2 (c)

The majority of candidates scored 1 mark for describing degradation, with the stronger responses extending answers drawing from most areas of the mark scheme. Few responses showed knowledge of commercial compositing systems.

(c) Describe how micro-organisms are used to aid the disposal of environmentally friendly polymers.

(2)

micro-organisms are used to break down the polymers into a less harmful inert material. They are found present in natural soils & sewage and will attack the polymers molecular structure to reduce it to a harmless inert material.

(Total for Question 2 = 10 marks)



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Examiner Comments

A good response with a clear description of the degradation process.

(c) Describe how micro-organisms are used to aid the disposal of environmentally friendly polymers.

(2)

* Micro ~~as~~ organisms break down the polymers so that they degrade faster and without being sent to incinerators or filling up landfill. ~~Micro~~ They turn the polymer into a ~~biopoly~~ bioproduct that biodegrades.



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Examiner Comments

The candidate clearly describes the role of the micro-organisms but does not give any further relevant knowledge.

Question 3 (a)

Most candidates scored well here identifying relevant benefits. Repeat answers were a problem with candidates saying the same point over again just in different words, leading to lost marks.

Where a candidate stated multiple valid benefits in one sentence each was awarded separately up to the maximum of 4. I do not recommend this as a good technique as candidates will become confused and further repetition will likely result.

3 Many developing countries host 'offshore' manufacturing facilities for multinational companies.

(a) Give **four** benefits to a developing country of hosting the manufacturing facilities of a multinational company.

(4)

- 1 Developing countries can gain experience from the multinational company.
- 2 The country will gain more money and notice furthering their chance of becoming a bigger and well known country in the future.
- 3 Future investment from the developing country may be a success.
- 4 More Revenue for the developing country.



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Examiner Comments

It is good to see the candidate has underlined the key words in the question. All answers given are appropriate to the question but unfortunately the last three are all the same point regarding increased wealth being brought to the country.



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Examiner Tip

Candidates need to check their responses to particularly guard against repeats in this type of question.

3 Many developing countries host 'offshore' manufacturing facilities for multinational companies.

(a) Give **four** benefits to a developing country of hosting the manufacturing facilities of a multinational company.

(4)

- 1 better increase of living conditions as they are earning money.
- 2 new skills learned and development in terms of manufacturing ability.
- 3 better infrastructure such as new transport and buildings as a result of foreign currency.
- 4 foreign currency being brought into ^{the} country along with new technology helps development grow faster.



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Examiner Comments

A very good response covering four different and clearly stated benefits. Again I applaud the underlining of key words in the question.

Question 3 (b)

A wide range of responses given with most candidates starting with gaining marks for cheaper labour. A minority of responses diverged from the focus of the question and gave advantages of moving nearer to materials supply. This may be a co-incidental factor for some businesses but it is an issue separate from the focus of the question and hence did not gain marks.

(b) Explain **two** advantages for a multinational company of moving its manufacturing facilities to developing countries.

(4)

1 unskilled workers with no alternative of work means a cheaper labour force.

2 Raw materials could be cheaper if located in same country, also with no importing costs. Resulting in lower Marginal costs.



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Examiner Comments

Response 1 does not contain an explanation of the advantage to the business.

Response 2 is a divergence from the question. (See question introduction.)

(b) Explain **two** advantages for a multinational company of moving its manufacturing facilities to developing countries.

(4)

1 Labour costs are low so the overall cost of manufacture is lower therefore increasing profit of the products.

2 As the country may have different regulations the company does not have to spend as much money on hygiene and disposal of waste therefore increasing their profits.



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Examiner Comments

2 clear points with the advantages to the company explained.

Question 4 (a) (i)

A small straight forward question which was an easy mark for the majority of candidates. Having said this, responses that simply focused on the role of CAD or CAM were not acceptable, of which there were a significant number.

4 (a) Artificial intelligence (AI) is being increasingly developed for use in the manufacturing industry.

(i) State what is meant by the term 'artificial intelligence' (AI).

(1)

Artificial intelligence means, when a ^{something} machine
is created to be able to perform tasks on
it's own using computer technology.



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Examiner Comments

Too vague. The candidate needs to be much more specific in order to gain a mark.

4 (a) Artificial intelligence (AI) is being increasingly developed for use in the manufacturing industry.

(i) State what is meant by the term 'artificial intelligence' (AI).

(1)

artificial intelligence means that a system/computer has the ability to learn, ~~and~~ adapt and ~~not~~ evolve from its experiences.



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Examiner Comments

A clear understanding shown.

Question 4 (a) (ii)

This question was the least well answered across the whole paper. Few candidates had a clear idea of how AI systems were applied in design and manufacture. Responses ranged from simple quality control checking with an accept/reject decision, to vague descriptions of systems that improved production without being programmed. Only the strongest candidates scored well here.

(ii) Explain **two** ways artificial intelligence (AI) can be used to support product design and manufacture.

(4)

1. Manufacturing products sometime has a boring job that a human ~~be~~ will quickly lose interest in and start to make mistakes, A robot will follow what it is programmed to do and will follow this to a High standard.

2. intelligent ~~program~~ CAD/CAM programs can be used to give a 3D representation of what the final design will look like so a decision can be made wheater or not the product is to be put into production.



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Examiner Comments

This response never progresses further than a description of CAD and CAM and is therefore worth no marks.

(ii) Explain **two** ways artificial intelligence (AI) can be used to support product design and manufacture.

- (4)
- 1 During the manufacturing process 'AI' can be used to spot errors while producing a product. If the metal in the jig for a car is not placed correctly rather than continuing to weld it will stop, either place it correctly or alert support workers at their desks.
 - 2 'AI' can be used during design and manufacture to see if something is feasible or not. So when designing on the computer or simulation can be run inputting dimensions and materials and the 'AI' will work out how much weight it should support etc.



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Examiner Comments

A stronger response which starts with a description of a system that can adapt its actions in response to a variable situation.

The second response shows a clear understanding of a simulation being able to make a judgement on the feasibility of a design.

Question 4 (b)

The vast majority of candidates understood the concepts of JIT systems well and gained reasonable marks. Having said this the question differentiated well with most scoring some marks, and a few able to identify and explain three separate features. Again repetition was a problem here although I would still encourage candidates to have a go and not leave responses blank.

(b) Explain **three** reasons why the operation of a just in time (JIT) system leads to 'lean manufacturing.'

(6)

1 JIT will lead to lean manufacturing as the product will only be manufactured when there is a need for it.

2 It allows the machinery to perform other manufacturing techniques ^{and skills} while there is not a demand for that product.



ResultsPlus Examiner Comments

First response explains a valid feature of a JIT system but does not state how this leads to it being lean, i.e. they have not identified what is being saved or reduced.

The second response is a deviation and relates to the flexible nature of CNC machines rather than focusing on the stock control system, and is therefore invalid.



ResultsPlus Examiner Tip

Underline key words, focus on the question.

Have a go, do not leave blank responses.

(b) Explain **three** reasons why the operation of a just in time (JIT) system leads to 'lean manufacturing.'

- 1 Just in time minimises waste because only the exact amount of materials and components that are needed are ordered. This means the manufacturing process is lean because there is less waste and so less money wasted. (6)
- 2 Just in time minimises stock ^{costs} because materials and components are only ordered and delivered when needed. This is lean manufacturing because there isn't a back pile of stock which costs money to store.
- 3 Just in time minimises idler resources by keeping sections of the assembly line running by delivering the components and materials they need when they run out or the last delivery. This is lean manufacturing because the company is not paying for a piece of machinery which isn't been used to its full capacity.



ResultsPlus Examiner Comments

A strong response gaining full marks. Please note that the first answer is focused on the 'amount' of stock delivered, and the second on 'when' the stock is delivered, which are two separate issues each worthy of a mark.



ResultsPlus Examiner Tip

If you need more space please use the blank areas underneath questions as has been done here. Only request an additional sheet if you reach the bottom of the page and still have more to say.

Question 4 (c)

Responses to this question were generally weak with few candidates gaining more than 4 marks. Most candidates correctly identified redundancies but few went further. At this point many responses diverged into lengthy descriptions of the benefits of CIM and robotics, rather than staying with the thrust of the question concerning the impact on employment. Underlining key words may have made a significant difference to candidates' responses here.

(c) Describe the impact that the increasing use of computer integrated manufacturing (CIM) is having on employment and the nature of jobs.

(6)

Using ~~Smart~~ Computer integrated manufacture is having a large impact on the employment in industry. This is because large amounts of human jobs are now carried out by using robots and other machines for designing and the manufacturing phase, such as jobs on the production line, which are now mostly carried out by modern robots, simply because they can carry out ~~big~~ tasks faster and at a far greater precision than a human can, which means that a larger turnover of products can be achieved, so therefore a far greater turnover, which simply leaves no choice for manufacturers to replace humans with robots, which reduces employment in industry vastly.

The nature of jobs left is simply technical & drawings of products and other types of jobs that robots simply aren't capable of yet.

Therefore the use of computers in industry has had a great impact on jobs



ResultsPlus Examiner Comments

A lengthy and irrelevant description of the benefits of robotics with a point made about this leading to unemployment. This type of response was all too common.



ResultsPlus Examiner Tip

Read the question carefully, then read it again underlining key words, think about what it is asking you to do, then respond. Many candidates saw a few key words in the question, thought they knew what it was about, then proceeded to throw away marks.

(c) Describe the impact that the increasing use of computer integrated manufacturing (CIM) is having on employment and the nature of jobs.

(6)

- Computers are being used more and more, this means less jobs for people, so higher numbers of unemployment.
- Computers can be maintained and used easily so the need for skilled and crafted workmen is not needed. This means skills and craftsmen are disappearing.
- CIM means production speeds and quality has increased, therefore jobs are becoming very competitive and fought for ~~so that~~ by employees so that they don't find themselves unemployed.



ResultsPlus Examiner Comments

This is an interesting response where the candidate seems to have structured their answer as an 'explain three points' rather than a 'describe', for six points. This has cost them marks.



ResultsPlus Examiner Tip

Candidates should be taught how to respond to the different command words used. Specific advice is given in the 'Exam cafe' sections in the endorsed textbooks. Wrongly structured answers will not score well.

Question 5 (a)

A good range of responses presented many of which showed clear knowledge of design history and the Bauhaus movement. Most candidates accessed the question and scored some marks, although a significant number did not stay focused on the three statements, resulting in lost marks with correct but irrelevant points about the design of the chair. Those who focused their responses appropriately often scored well.

5 Three key principles of the Bauhaus design movement are:

- 'Form follows function'
- 'Products for a machine age'
- 'Everyday objects for everyday people'

Figure 1 shows a picture of Marcel Breuer's 'Wassily' chair.

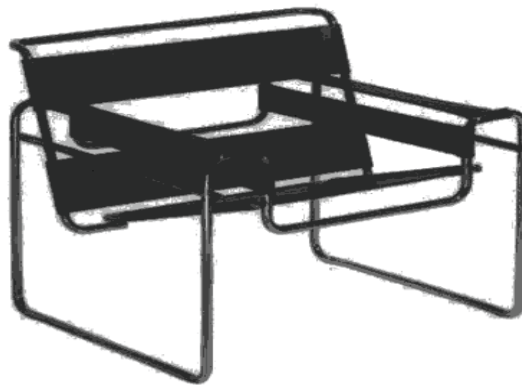


Figure 1

(a) Describe how the 'Wassily' chair demonstrates these key principles.

(4)

The chair is much more functional than it is artistic. It doesn't look like the most comfy chair but has the correct function.

- 'everyday object' - everyone is always in need of a chair - functional.
- very minimalist. no fancy materials or patterns. it is simply a chair to sit on.
- 'machine age' the tubular steel makes it look almost mechanical.



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Examiner Comments

Response shows a clear understanding that 'function' is the driver. 'No patterns' also gets a mark, as does the reference to a mechanical look. The comment about everyone needing a chair is vague and has not been accepted.

5 Three key principles of the Bauhaus design movement are:

- 'Form follows function'
- 'Products for a machine age'
- 'Everyday objects for everyday people'

Figure 1 shows a picture of Marcel Breuer's 'Wassily' chair.

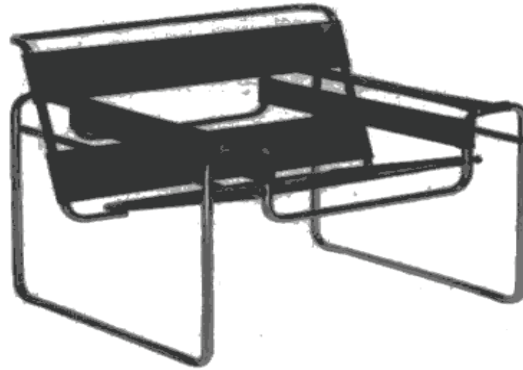


Figure 1

(a) Describe how the 'Wassily' chair demonstrates these key principles.

(4)

The 'Wassily' chair demonstrates these key principles as it is an object that can be used for everyday use for people to sit on. It has been designed so that it is practical, yet able to perform fully as an everyday object. It has been made from tubular steel, therefore very little waste was produced as it is all one roll.



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Examiner Comments

Very little relevant information is presented here. 'Designed so that it is practical' hits the function mark, but the rest is irrelevant. The candidate has not focused on the three statements in the question but has just made a number of observations about the chair. Although many of these statements are correct they do not address the question. Hence the candidate scored poorly.

Question 5 (b) (i)

An easy mark for most candidates, although a number of responses were mis-directed or so vague as to not be worthy of a mark.

(b) The use of anthropometric data is an essential part of product design.

(i) State the meaning of the term 'anthropometric data.'

(1)

This is when data relating to size and shape is collected.



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Examiner Comments

Too vague. This could relate to the size and shape of anything.

(b) The use of anthropometric data is an essential part of product design.

(i) State the meaning of the term 'anthropometric data.'

(1)

~~To measure~~ The measurements of the human body



ResultsPlus
Examiner Comments

A straight forward precise answer.

Question 5 (b) (ii)

A good range of answers generated by candidates. Most candidates had responses linked in with percentiles, distribution curves, collecting data and designing to fit the majority of the population. Adjustability and range of sizes were also regularly seen.

(ii) Describe how a designer would use anthropometric data to design a product that is suitable for a wide range of consumers.

(5)

To design a product a designer would have to look widely at existing products on the market. For it to appeal to a large range of consumers many aspects of what it needs to do should be considered. Data collected about other products will have to be examined to produce a product suitable.



ResultsPlus Examiner Comments

A meandering answer that begins to go in the right direction, but never actually gets there. No specific points have been made other than to re-word the question as a statement.



ResultsPlus Examiner Tip

The question is a 'Describe' for 5 marks. Candidates need to focus therefore on making at least five specific points related to the question, six might avoid the trap of a repeat. If candidates structure answers in this way then responses such as this will be rare.

(ii) Describe how a designer would use anthropometric data to design a product that is suitable for a wide range of consumers.

(5)

The data from a BSI data book, would be used to produce a product for 90% of the population (ignoring the extreme 5% on each end). This would therefore provide a product that is suitable for a wide range of customers. Also the use of quantitative (measurable) data would allow for a product to match a person. In addition to qualitative approach which is more ergonom based - is the product comfortable to use? In addition, the designer could design a product with one size fits all approach (eg a door) or different sizes of products (eg clothes) or adjustable products (eg office chair) or a product that allows an adaptable assembly

(Total for Question 5 = 10 marks)

to be included (eg a car seat for a child). All of these options allow a designer to make a product fit for a wide range of customers.



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Examiner Comments

A good response. The candidate makes a point and moves on. He/she does not get bogged down on explaining examples, but just keeps making points then moving on. This response contains more valid points than the 5 marks available.



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Examiner Tip

If time and knowledge allow, adding more points than the number of marks available avoids the trap of losing marks due to repeats or vagueness.

Question 6 (a)

Many good answers but many misdirected ones as well. A large minority of responses described the benefits of an LCA on the environment rather than the benefits to the company, hence gained few if any marks.

The command word is 'Explain' for 4 marks. Candidates should therefore be looking to make 2 points and explain each of them. A third point may provide a safety net.

- 6 (a) Explain how a company benefits from carrying out a life cycle assessment (LCA) on its product.

(4)

By ~~carry~~ carrying out a life cycle assessment (LCA) on their product the company can find out how long the product should last and how the product could be disposed of at the end of its life. They can also determine how ~~harmful~~ harmful the product will be to the environment for example ~~will~~ will it produce or cause green house gas emissons. ~~with the product~~ can the product be recycled or reused at the end of its life. They then can edit or change the design of their product to change the product ~~to~~ to make it recyclable or to make it more durable or even make it biodegradable. These are all important factors in products. They can also determine how sustainable a product is by carrying out a life cycle assessment (LCA). ~~or~~ They can therefore make changes to the product to increase its sustainability or they can leave the product the way it is.



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Examiner Comments

A lengthy response full of correct knowledge concerning carrying out an LCA, but none of it answers the question. Responses like this were unfortunately not uncommon. The question was worded carefully in an attempt to avoid this, but many candidates will not read and re-read questions until their understanding is clear, and therefore suffer the consequences.



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Examiner Tip

Underline key words, think about what you are being asked carefully.

6 (a) Explain how a company benefits from carrying out a life cycle assessment (LCA) on its product.

(4)

A life cycle assessment follows a product "from cradle to the grave", i.e. from the extract of raw materials, manufacture, right through to its disposal after use. A company would benefit from carrying out life cycle assessment as it would help the company identify hot-spots in the manufacturing process and also in other areas where energy is being wasted. By carrying out a life cycle assessment the company can change and adapt elements of its company so that it becomes more energy efficient and thus saves the company money whilst also saving the planet. For example, a company could source their materials locally instead of long-distance - thus saving transport costs. A life-cycle assessment identifies the materials used, thus a company could explore more environmentally friendly options and also aim to reduce its packaging. An example of this is a company called Ambler, where after an LCA was carried out they reduced their packaging and ~~transport~~ unnecessary transportation.



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Examiner Comments

An excellent response that focused on the question. Long before getting to the end of the response we have two clear benefits to the company that have been explained. Further relevant points are also included although the maximum mark is 4.

Question 6 (b)

Most candidates accessed the question appropriately and gained some marks, but few structured their answers with sufficient care to gain full marks. Many responses focussed on one example and got stuck on the specific issues related to that particular product rather than presenting points both for and against the wider issue of re-use to minimize waste. Alternatively, a significant number also diverged into recycling rather than reuse, failing to gain further marks.

* (b) Reusing products such as printer ink cartridges is one strategy used to minimise waste.

Evaluate the issues associated with reusing products to minimise waste.

(4)

This reduces space taken up in landfill sites. It reduces emissions given off by companies as they do not need to manufacture another product. It reduces household incineration. Designers have to design the product with re-use in mind which is more difficult. Products have to be cleaned before being reused which can be costly. There is still the cost of transporting ~~again~~ products that are going to be reused. It can be more time consuming for someone to reuse one item rather than replace, this is also evident in the ~~the~~ repair versus replace argument. However it reduces the demand on finite resources. Have to store the products that are going to be put back into the product such as the ink.



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Examiner Comments

A thorough response which gained the maximum 4 marks and then some! The candidate quickly moves through point after point showing a clear understanding from both a positive and a negative perspective.

* (b) Reusing products such as printer ink cartridges is one strategy used to minimise waste. 5

Evaluate the issues associated with reusing products to minimise waste.

(4)

Waste can be drastically decreased by the reuse of certain product, and this can help our Push to go green, But the reuse of products cuts the amount of sales that will be sold due to Reuse therefore lowering our GDP and putting inflation to a possible record high, meaning production and costs of buying will be so high that the sales will be lost all together and taxes will have to be increased to allow the waste system to continue in the UK. It is simply not cost efficient in the long run for more product to use this method.



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Examiner Comments

'Cuts down the amount of sales' gained the candidate a mark. Then instead of moving on to make another point the response continues to follow this line of thinking all the way through moving further and further away from the question.



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Examiner Tip

Stay focused on the question and do not go off at a tangent. Keep re-reading the question to ensure you stay with it.

Question 7 (a)

A small, but not un-challenging question in response to which the majority of candidates scored a single mark for identifying the link to carbon reduction strategies. A significant number understood the concept fully gaining both marks. Some candidates gave an explanation of carbon trading rather than carbon off-setting, gaining no marks.

7 (a) Explain what is meant by the term 'carbon offsetting'.

(2)

Carbon offsetting is the term given to the effort to reduce the harmful carbon emissions leaked into the atmosphere on a daily basis.



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Examiner Comments

One mark awarded for the recognition that it is a carbon reduction strategy.

7 (a) Explain what is meant by the term 'carbon offsetting'.

(2)

The ability to ~~compensate~~ ^{compensate} the CO₂ emissions by replanting trees in forests.



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Examiner Comments

A very brief but direct explanation of the term which shows a clear understanding and gained full marks.

Question 7 (b)

Many good answers were presented to this final question drawing from all parts of the mark scheme. Candidates were able to present clear arguments both for and against the use of these alternative fuels. Centres had prepared candidates well as a depth of knowledge was evident in many responses, with the better ones looking at both sides of the argument and scoring highly. A minority of responses veered off into discussing the issues surrounding other energy sources such as wind, tidal and nuclear.

*(b) Discuss the issues associated with the use of biomass and biofuels as alternative sources of energy.

(8)

Biomass and Biofuels are developed by growing them in a field or by harvesting them from cow excrement. Using these types of fuel have several implications, both positive and negative. Biofuels are very good because they can reuse unwanted materials. This would reduce the strain there currently is on fossil ~~the~~ fuels. One problem with biofuels is that they can be grown using fields which take up room which was being used to grow crops. This ~~will~~ therefore affects the amount in which farmers can grow food crops. Another issue is that there are problems when ~~the~~ setting up the processing with costs. Setting up such a large production of biomass is expensive and would be very hard to implement a efficient production. Biomass is of course carbon neutral which is very good for the environment, yet building plants to process the material would destroy habitats. Another issue is that biomass is unstable and long term effects of

it are unknown. Burning the Biomass itself is very bad for the environment as this releases carbon dioxide into the atmosphere. Scientists have shown that BioFuel is not as powerful or efficient as outstanding Fossil Fuels. Biomass also produces pollution ~~the~~ usually, ~~this~~ this could be in fields or processing plants for the produce. Transportation of Biomass also needs to be considered as moving the Biomass from fields to plants and then to the ~~customer~~ customers who will buy the product ~~the~~ could be bad for the environment.



ResultsPlus Examiner Comments

An example of a good response to this question, of which there were many. The candidate lays out the topic being discussed then sets about presenting points for and against it. The candidate does not get bogged down on any single point, nor are they deviated away from the question. Rather point after point is clearly made resulting in a high score.

* (b) Discuss the issues associated with the use of biomass and biofuels as alternative sources of energy.

(8)

Fossil fuels, when used can't be re-used, and currently, the amount of fossil fuels available are reducing drastically. This means that ~~we~~ we must start to consider other sources of energy. For example, Wind could be used by using windmills to turn turbines, and produce electricity. This would produce very little carbon emissions, however wind isn't always present, so it is an unreliable source of energy. Nuclear Fission is a process which involves using neutrons to split atoms, which releases energy. This is another alternative source of Energy. The advantages of Nuclear energy is that it releases large amounts of energy per kg of fuel, however Nuclear Energy releases harmful radiation into the atmosphere, which damages cells and can cause radiation sickness.



ResultsPlus
Examiner Comments

The candidate either does not know what biofuels are or has more likely misread the question, focusing on the phrase 'alternative sources', rather than 'biomass and biofuels'. As a result no marks were gained, which is a significant loss with this many marks available.



ResultsPlus
Examiner Tip

Every bit of time spent reading the questions carefully and identifying the key words has a significant positive impact on the quality of candidates responses.

Paper Summary

Improvements in the quality of responses were clearly evident this year. Having said this, some candidates continue to lose marks due to examination technique rather than subject knowledge. As well as thorough revision I would recommend the following to all candidates:

That all candidates thoroughly understand and are practiced in responding to the different command words used in the examination paper. The 'Exam Cafe' section of the endorsed text book is an invaluable resource for this.

Candidates must read questions several times and identify the key words. This is absolutely vital in correctly focusing their responses.

Any time at the end of the exam should be spent carefully checking understanding of the questions as well as reading answers and adding further detail where possible.

Handwriting remains an issue in some cases. Examiners will try hard to decipher responses, but in a few cases it is simply not possible, leading to possible lost marks. Candidates need to ensure that all text is clear and legible.

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