



GCSE MARKING SCHEME

SUMMER 2023

**GCSE
DESIGN AND TECHNOLOGY – PRODUCT DESIGN
3603U10-1**

INTRODUCTION

This marking scheme was used by WJEC for the 2023 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

GCSE DESIGN AND TECHNOLOGY – PRODUCT DESIGN

SUMMER 2023 MARK SCHEME

Question 1				
The auxiliary handle shown below has been designed to fit onto existing garden tools.		AO3	AO4	Mark
(a)	Describe one ‘market pull’ factor that has resulted in the design of the auxiliary handle		✓	[2]
<p>Answers relating to one market pull factor should be awarded up to 2 marks.</p> <p>Guidance: Candidates must be able to describe a reason why the Target Market require the auxiliary handle. Responses may directly mention elderly / disabled / users with physical difficulties, or that the need was identified as a result of market research.</p> <p>No answer or no relevant information presented or discussed. 0</p> <p>Simplistic or basic response To help them use the existing garden tool 1</p> <p>More detailed response To provide additional leverage / forces to use the existing garden tools to dig / weed gardens, without which the existing tools would be insufficient. 2</p>				
(b)	Anthropometrics involves studying human sizes. Explain two anthropometric considerations that the designer would need to include for the auxiliary handle to be successful.		✓	2 x [2]
<p>Answers relating to two DIFFERENT anthropometric considerations should be awarded up to 2 x [2] marks.</p> <p>Guidance: Candidates are likely to discuss the width of the hand measurement to guide the width of the handle. The circumference of user’s hands that for the grip is critical to ensure the diameter / radius of the handle is correct. Look for 2 different detailed responses, DO NOT credit repetitive statements. DO NOT credit repetitive responses from (a) regarding user needs / wants.</p> <p>No answer or no relevant information presented or discussed. 0</p> <p>Simplistic or basic response The distance across the knuckles 1</p> <p>More detailed response The width of the users hand so that the handle is the correct width for users to grasp comfortably. 2</p>				

		AO3	AO4	Mark
(c)	The auxiliary handle retails at £4.00. Explain both the economic and social benefits that this brings the user.		✓	[4]
	<p>Answers relating to both social and economic benefits of the auxiliary handle should be awarded up to 4 marks.</p> <p>Guidance: Candidates could discuss the economic benefits as purchasing a £4 additional product allows other product to be used more effectively. Economically this makes sense. It is far cheaper than buying a new different garden product; the usual garden products are still accessible. It is a very cost effective multi-purpose product that fits lots of other existing tool handles. Socially, this product allows users to work in the garden, at allotments, to be outdoors, to improve health / wellbeing / meet –work with others and therefore provides social benefits.. DO NOT credit repetitive statements. Responses for 4 marks must include both economic and social benefits.</p> <p>No answer or no relevant information presented or discussed. 0</p> <p>Simplistic or basic response It is a cheap product to buy Or It allows users to continue to do gardening 1</p> <p>More detailed response covering one in detail or covering both superficially £4 is very reasonable to purchase and can be used with any existing tools such as spade, rake, sweeping brush. Or The handle allows users with limited physical mobility to undertake outdoor activities themselves enhancing social possibilities working outside environment. 2</p> <p>Detailed explanation or response covering social and economic benefits. £4 is very reasonable to purchase and can be used with any existing tools such as spade, rake, sweeping brush, and allows users independence and continue gardening when it could be difficult. 3</p> <p>Highly detailed response with explanation of both social and economic benefits £4 is very reasonable to purchase and can be used with any existing tools such as spade, rake, sweeping brush. The handle allows users with limited physical mobility to undertake outdoor activities themselves enhancing social possibilities working outside environment. 4</p>			
			Total	10

Question 2		AO3	AO4	Mark
The images below show a bicycle carrier which can be mounted to the roof of most vehicles.				
(a)	The frame of the bicycle carrier is made from aluminium tubing. Describe two benefits of using aluminium for the bicycle carrier.		✓	2 x [2]
	<p>Answers that describe two benefits of using aluminium can be awarded up to 2 x 2 marks</p> <p>Guidance: The benefits of using aluminium generally consist of the strength weight ratio and the resistance to corrosion in outdoor situations. Responses relating to colour and finish may also be acceptable. DO NOT credit repetitive responses. Accept standard stock size responses.</p> <p>No answer or no relevant information presented or discussed. 0</p> <p>Simplistic or basic response Aluminium is a strong light material Or Will not rust when used on the car 1</p> <p>More detailed response Aluminium is a strong and lightweight material which will add little additional mass to the car but support the bicycles fully. Or Aluminium provides corrosion resistance so when used on the roof of the car, the bicycle carriers will not rust or corrode and will last a long time. 2</p>			
(b)	Explain two properties of ABS that make it a suitable material for the clamp of the bicycle carrier.		✓	2 x [2]
	<p>Answers relating to ABS providing robust, strong and tough material required for the clamp to hold the bicycle frame securely. ABS enables injection moulding identical clamps required. Two advantages of this material to the user can be awarded up to 2 marks x 2.</p> <p>Guidance: DO NOT credit repetitive responses.</p> <p>No answer or no relevant information presented or discussed. 0</p> <p>Simplistic or basic response ABS is a strong material Or ABS is a tough material needed for the clamp 1</p> <p>More detailed explanation or response ABS is a tough and strong material so this will not crack or split under compression when holding the bicycle. Or ABS is perfect for injection moulding so lots of clamps can be made ensuring that they are identical to hold the bicycle securely. 2</p>			

The two bicycle wheels are secured using a quick release rubber polymer strap as shown below.		AO3	AO4	Mark
(c)	Describe the properties of the rubber polymer that make it appropriate for the quick release strap.		✓	[4]
	<p>Answers must describe two different properties of rubber that makes it suitable for the bicycle holder strap. DO NOT credit repetitive responses.</p> <p>No answer or no relevant information presented or discussed.</p> <p>Simplistic or basic response Rubber is flexible and can take the required shape of the bicycle wheel.</p> <p>Or Rubber will not crack or tear</p> <p>More detailed explanation or response Rubber is flexible and has good tensile strength so securely hold a variety of bicycle wheel diameters.</p> <p>Or The strap needs to have good tensile strength and tear resistance when used to hold bicycles in a range of temperatures and weather conditions.</p>			0 1 1 2 2
(d)	The bicycle carrier features two separate locks. Describe why two separate locks are necessary.		✓	[4]
	<p>Answers relating to the reason for 2 separate locks should be awarded up to 4 marks. DO NOT credit repetitive responses.</p> <p>Guidance: The lock attached to the clamping mechanism is to fully secure the bicycle when held by the cycle carrier on the roof of the car. This is an anti-theft feature so the user can leave the bicycle on top of the car secure and safe. The second lock provides a method of locking the cycle carrier to the roof bars of the car. This prevent theft and provides security so that the cycle carrier cannot be removed from the roof bars of the car.</p> <p>No answer or no relevant information presented or discussed.</p> <p>Simplistic or basic response To keep the bike safe</p> <p>Or Stop the bike being stolen.</p> <p>More detailed response about one or both locks To allow the user to be able to lock the carrier onto the bicycle once it is fitted so that it cannot be stolen. Or One locks the bike, the other locks the carrier to the car.</p> <p>A Detailed explanation including both locks The clamp can be locked once the bicycle is fitted. This remains secure and cannot be stolen. The second lock allows the cycle carrier to be securely fitted to the car roof.</p> <p>A highly detailed response which fully explains the need for two separate locks. One lock allows the clamp to be locked once the bicycle is fitted. This remains secure and cannot be stolen. The user can then leave the vehicle with bicycle fitted with peace of mind. The second lock allows the cycle carrier to be securely fitted to the car roof. This means that when the bicycle is being used, the bicycle holder is securely locked to the car roof bars and cannot be removed / stolen.</p>			0 1 1 2 2 3 4

		AO3	AO4	Mark
(e)	The roof bar shown below is made from aluminium using the extrusion process. Explain why extrusion is an effective production method for the roof bar.		✓	[4]
	<p>Answers explaining how extrusion is an effective production method for the roof bars should be awarded up to 4 marks.</p> <p>Guidance: DO NOT credit repetitive responses. Extrusion is effective because the cross-sectional shape of the roof bars is consistent and constant throughout its length. Extrusion allows the aluminium to be heated and pushed / pumped through the die, ensuring the consistent cross section as the material is drawn through in lengths. Extrusion works well with aluminium due to a lower melting point than some other metals. There is no waste, and the complex shape of the bars can be achieved using the extrusion process. Complex or difficult shapes are easily produced using extrusion. Extrusion is often self-finishing.</p> <p>No answer or no relevant information presented or discussed. 0</p> <p>Simplistic or basic response Extrusion is useful because the bar is a difficult shape 1</p> <p>More detailed explanation or response Extrusion is useful because aluminium can be heated at lower temperatures than other metals, and form the shape of the bars accurately. 2</p> <p>A detailed explanation or response Extrusion is useful because aluminium can be heated at lower temperatures than other metals, and form the cross section of the bars accurately and consistently. 3</p> <p>A highly detailed explanation or response Extrusion is useful because aluminium can be heated at lower temperatures than other metals, and a die will ensure that the cross section of the bars are accurate and consistent throughout the length of the roof bar for the car. Extrusion is an economical and reliable process for this type of material and shape. 4</p>			
			Total	20

Question 3

Study the details below of the 'power & play' product. Features:		AO3	AO4	Mark
	<ul style="list-style-type: none"> Includes a 4000 mAh power bank with LED display and torch feature. 3-in-1 cable compatible with Apple Lightning, Apple 30-pin, and micro USB connections. Earbud style in-ear headphones with in-line microphone. 			
(a) (i)	Explain why this product has been developed.		✓	[2]
	<p>Answers relating to describing the design context / need for this should be awarded up to 2 marks</p> <p>No answer or no relevant information presented or discussed. 0</p> <p>Simplistic or basic response For people to charge phones / products if they run out Or For users to have a 'back up' in case they run out of power 1</p> <p>More detailed response For owners / users of portable handheld electronic products to have a method of recharging devices 'on the go' away from traditional power sources. 2</p>			
(ii)	Describe the target market that the 'power & play' product was designed for.		✓	[2]
	<p>Answers relating to the description of an appropriate target market can be awarded up to 2 marks.</p> <p>Guidance: Responses should identify typical clients, age, gender, interests, hobbies and other features that allow them to be specified as targets for this product. Responses may include holiday makers, people who travel a lot, commuters, students who travel using public transport and have multiple devices to charge.</p> <p>No answer or no relevant information presented or discussed. 0</p> <p>Simplistic or basic response Users who are 'sporty' and spend lots of time outdoors. Or Younger Males (due to blue colour) aged 10+ who use tablets and phones. 1</p> <p>More detailed response People, probably males, who like blue colours and enjoy being outdoors, and use handheld portable electronic products like mobile phones, tablets etc. Or Users who participate in sports / outdoor events for long time periods who require the ability to re-charge electronic products whilst being unable to connect to mains. 2</p>			

		AO3	AO4	Mark
(iii)	Explain the reason for including the 3-in-1 charging cable.		✓	[3]
	<p>Answers relating to reason for including the 3 in 1 charging cable should be awarded up to 3marks.</p> <p>Guidance:</p> <ul style="list-style-type: none"> • 3 in 1 prevents the need for lots of different cables. • No need to change interconnecting heads • Will suit multiple devices owned by the user • Will be more compatible with a wider range of products • Less parts required (to manufacture or to carry) • Appeal to a wider target market • Can charge multiple products at same time. • 3 leads attracts more buyers therefore more profit form increased sales <p>No answer or no relevant information presented or discussed. 0</p> <p>One simplistic or basic response Fits more products 1 Or Saves space as it's less than 3 leads 1</p> <p>More detailed explanation or response The 3 in 1 lead does fits several devices and saves more space than having 3 different leads. 2</p> <p>A fully detailed explanation The 3 in 1 lead does fits several devices and saves more space than having 3 different leads. This also provides more flexibility to charge up to 3 devices at once which will appeal to more consumers. 3</p>			
(b)	The LEDs shown in the image below indicate the charge in the power bank.			
(i)	Explain one benefit for including the indicator in the power bank.		✓	[2]
	<p>Answers relating to one benefit to the user of the indicator should awarded up to 2 marks. DO NOT credit multiple responses.</p> <p>No answer or no relevant information presented or discussed. 0</p> <p>Simplistic or basic response Tells the user how much power is left 1 Or So the user can see how much power has been used. 1</p> <p>More detailed explanation or response Users can clearly see how much power is available in the bank and how much is used so they can top up if needed to get to full. 2</p>			

		AO3	AO4	Mark
(ii)	Explain one limitation for including the indicator in the power bank.		✓	[2]
	<p>Answers relating to limitations to the user for including the indicator should be awarded up to 2 marks.</p> <p>Guidance: Acceptable answers may include the indicator being inaccurate or a lack of a specific percentage of charge remaining in the power bank. No answer or no relevant information presented or discussed. 0 Simplistic or basic response The indicator uses power up 1 More detailed explanation or response The power indicator illuminates LEDs which consume power and will run the power bank down more quickly than if they were not used. 2</p>			
(c)	The 'power & play' is sold in a casing consisting of a two-part transparent outer shell.		✓	[2]
(i)	Give one reason why the manufacturer would choose to make the two-part casing transparent.			
	<p>Answers relating to reasons for the transparent casing should be awarded up to 2 marks.</p> <p>No answer or no relevant information presented or discussed. 0 Simplistic or basic response For it to be see-through 1 More detailed explanation or response To show the content inside so consumers can see the product, components and what they are purchasing / using. 2</p>			
(ii)	Explain why transparent polycarbonate is a suitable material for injection moulding the two-part casing.		✓	[2]
	<p>Answers explaining why transparent polycarbonate is suitable should be awarded up to 2 marks</p> <p>No answer or no relevant information presented or discussed. 0 Simplistic or basic response Polycarbonate is a hard plastic to protect the power bank. 1 More detailed explanation or response Polycarbonate is a very tough, impact resistant material to protect the contents of the case. It is chemical, water and moisture resistant.to protect the power bank outdoors. 2</p>			

		AO3	AO4	Mark
(d)	The white opaque insert fits inside the casing and securely holds the component parts of the 'power & play' product.			
(i)	State the name of a suitable thermoplastic sheet for making the insert		✓	[1]
	Answers naming an appropriate thermoplastic sheet should be awarded 1 mark			0
	No answer or no relevant information presented or discussed.			
	Name of an appropriate sheet material			1
	HIPS (High Impact Polystyrene)			
	Or			
	HDPE			
	Or			
	ABS			
(ii)	Name and describe in detail a suitable manufacturing process that could be used to make the insert in a school workshop.		✓	[5]
	Answers naming an appropriate manufacturing process should be awarded 1 mark.			0
	No answer or no relevant information presented or discussed.			
	Name of an appropriate manufacturing process			1
	Vacuum Forming			
	Detailed description of a suitable manufacturing process should be awarded up to 4 marks.			0
	No answer or no relevant information presented or discussed.			
	Simplistic or basic response			1
	Form the shape using a mould / former			2
	More detailed explanation or response			2
	Make a former in desired shape, heat the sheet polymer and form around the former.			
	A detailed explanation or response			3
	Produce a former in the shape of the desired tray. Place on the platen of the vacuum forming machine, and lower. Position HIPS sheet over the seal, heat and then turn on vacuum to achieve former shape.			
	A highly detailed explanation or response			4
	Produce a former in MDF or similar in the shape of the desired tray, with draft angles for removal of tray. Place on the platen of the vacuum forming machine, and lower. Position HIPS sheet over the seal and clamp to create an air tight chamber. Heat until soft and flexible, and then turn on vacuum pump to remove all air, pulling the HIPS sheet tightly around the former to achieve the desired shape.			

The power bank displays important information for the user. The RoHS symbol shown on the product refers to Restriction of Hazardous Substances.		AO3	AO4	Mark
(e)	Explain the reason for the symbol and the impact that this has on the manufacturer.		✓	[4]
	Detailed description of a RoHS should be awarded up to 4 marks.			
	No answer or no relevant information presented or discussed.			0
	Simplistic or basic response RoHS is about hazardous substances			1
	More detailed explanation or response RoHS stands for Restriction of Hazardous Substances and limits the use of dangerous materials.			2
	A detailed explanation or response RoHS stands for Restriction of Hazardous Substances and limits the use of dangerous materials found in electrical and electronic products. It tells the consumer that materials like Lead are banned and not used.			3
	A highly detailed explanation or response RoHS stands for Restriction of Hazardous Substances and prevents the use of dangerous materials found in electrical and electronic products such as mercury, cadmium and lead. These are all harmful to the environment and pollute landfill, and can be dangerous during manufacture and disposal. It reassures the consumer that hazardous materials are banned and not used.			4

Question 4

The portable self-assembly hockey goals shown below have been designed for primary school indoor games lessons.		AO3	AO4	Mark
(a)	Explain one advantage to the primary school for purchasing the self-assembly hockey goals.		✓	[2]
	<p>Answers relating to one advantage to the primary school should be awarded up to 2 marks</p> <p>Guidance The goals shown are with hockey sticks, but the goals could be used for other sports such as football. This is acceptable as a response.</p> <p>No answer or no relevant information presented or discussed 0</p> <p>Simplistic or basic response 1 The hockey goals are quick and easy to assemble</p> <p>A more detailed explanation or response 2 The hockey goals are quick and easy to assemble and disassemble without any specialist tools. This can save space when they are stored away.</p>			
(b)	The product cycle graph below shows how the sales of the self-assembly hockey goals occur over time.			
(i)	Describe what happens to product sales at each of the 4 stages in the graph.		✓	4 x [1]
	<p>Answers relating to describing what happens at each stage of the life cycle graph should be awarded up to 1 mark each. DO NOT award a mark for the term only e.g. Launch, growth, peak, decline – there must be a description.</p> <p>No answer or no relevant information presented or discussed 0</p> <p>At the first stage, the product is released onto the market 1</p> <p>The second stage, the product begins to sell more / become more popular 1</p> <p>The third stage is when sales reach their highest 1</p> <p>The fourth stage shows the product is in decline and sales fall 1</p>			

		AO3	AO4	Mark
(ii)	Explain the impact on the manufacturer of the hockey goals at point A .		✓	[3]
	<p>Answers relating to explaining the impact on the manufacturer at point A should be awarded up to 3 marks.</p> <p>No answer or no relevant information presented or discussed</p> <p>Simplistic or basic response The manufacturer will make most profit here Or The manufacturer will be busiest at this point</p> <p>More detailed explanation or response The manufacturer will make the highest profits here because sales are at their peak. Or The manufacturer will need to supply the highest demand so production will be under pressure.</p> <p>A detailed explanation or response The manufacturer will make the highest profits here because sales are at their peak, and will probably have market leader status, and demand for the product is very high so production will be very busy. Or The manufacturer will need to supply the highest demand so production will be under pressure in order to ensure consumers receive the product. Manufacturers want to avoid products going 'out of stock' as there is a risk of no sale.</p>			<p>1</p> <p>1</p> <p>2</p> <p>2</p> <p>3</p> <p>3</p>
(iii)	Explain one possible benefit to the consumer of purchasing the product at point B .		✓	[2]
	<p>Answers relating to benefits for consumers at point B should be awarded up to 2 marks.</p> <p>No answer or no relevant information presented or discussed</p> <p>Simplistic or basic response There will be plenty of products available as demand is lower Or There may be sales on e.g. discounted RRP</p> <p>More detailed explanation or response There will be plenty of products available, probably at discounted prices which will be cheaper to purchase. Or There is likely to be clearance strategies in order to sell surplus products so consumers may have a better deal when purchasing.</p>			<p>0</p> <p>1</p> <p>1</p> <p>2</p> <p>2</p>

		AO3	AO4	Mark
(iv)	Explain what options the manufacturer has once the product has reached point B on the life cycle graph.		✓	[4]
	<p>Answers relating to explaining the options available to manufacturer at point B should be awarded up to 4 marks. DO NOT credit repetitive responses. Responses repeating (iii) will not answer this question.</p> <p>No answer or no relevant information presented or discussed</p> <p>Simplistic or basic response At point B, the manufacturer would stop production.</p> <p>More detailed explanation or response At Point B, the manufacturer would stop production because the demand for the product has dropped, and there would be plenty already available to sell.</p> <p>A detailed explanation or response At Point B, the manufacturer would stop production because the demand for the product has dropped, and there would be plenty already available to sell. The manufacturer could 'face lift' the product changing it slightly to boost sales.</p> <p>A highly detailed explanation or response At Point B, the manufacturer would stop production because the demand for the product has dropped, and there would be plenty already available to sell. The manufacturer could revitalise the product changing it slightly to boost sales, or even introduce a radically new product to supersede the existing one.</p>			<p>0</p> <p>1</p> <p>2</p> <p>3</p> <p>4</p>

Question 5

Study the images of Dyson products shown below.		AO3	AO4	Mark
(a)	Analyse how the features of Dyson products have made them popular and successful, achieving market leader status.	✓		[5]
	<p>Answers relating to analysing how features of Dyson products have made them popular and successful achieving market leader status should be awarded up to 5 marks</p> <p>Guidance:</p> <ul style="list-style-type: none"> • Colour schemes very vibrant and gender neutral – attracts more male users • Cyclonic action improves suction – better performance than competitor products. • Centrifugal force to separate dust particles to avoid needing filters. • Bagless vacuum cleaner – transparent bin can be emptied endlessly • Slick geometric futuristic shape and form which is more attractive / modern than current competitor products. • Bladeless fans which heat and cool, removing allergens using HEPA filters. • Very stylish products with high build quality • Ball features – 360-degree rotation for easier manoeuvrability. • Fans are easy to clean, no grills or blades unlike competitor. • Clean lines, simple shapes and forms, hygienic finish. • Market leader status due to brand loyalty because high level function / performance • After sales services are very effective / supportive, spare parts readily available. • Long life expectancy / reliability reputation. <p>No answer or no relevant information presented or discussed</p> <p>Brief description, very little analysis, simplistic or basic response Dyson products use very similar colour schemes like greys whites with some flashes of yellows. They are very geometric and symmetrical shapes which perform very well. They are the best products in their class.</p> <p>More detailed analysis showing more understanding of features that make products popular and successful AND contribute to market leader status. Dyson products are very high quality with excellent performance. This results in very high customer satisfaction and increased demand through high reputation. Dyson's products are very high quality with clean lines and geometric shapes.</p> <p>A clear and detailed analysis of the features that make products popular and successful AND contribute to market leader status Dyson products are very high quality with excellent performance. This results in very high customer satisfaction and increased demand through high reputation. Dyson's products are very high quality with clean lines and geometric shapes, and are scientifically very innovative. Neutral shades of main colour with flashes of bright colours like yellow are common. Dyson secures optimum performance and efficient user interface with all products, making them stand out well above competitor brands and products.</p>			0 1-2 3-4 5

	AO3	AO4	Mark
(b)	Analyse how Dyson products reflect a 'form follows function' design approach.	✓	[5]
	<p>Answers relating to the analysis of how Dyson products reflect 'form follows function' design approach should be awarded up to 4 marks.</p> <p>Guidance:</p> <ul style="list-style-type: none"> • Analysis of how the performance of Dyson's products leads the way in product innovation. • Identification of key functional features that make Dyson products outstanding. • Analysis of how the function might be developed 'first' then the shape secondary. • Bladeless fan providing 30% increase in power • DC01 cyclonic action providing innovative performance of dust separation. • Ball technology allowing 360-degree steering and enhanced user control • Wireless developments allowing lighter more portable products. • Scientific principles provoking innovation rather than form, aesthetics or styling details. • Visual attributes taking a secondary importance to performance criteria. <p>No answer or no relevant information presented or discussed</p> <p>Simple or basic analysis of how Dyson product reflect 'form follows function'. Dyson products always work well first and worry about looks afterwards because function is the priority.</p> <p>Some analysis of how Dyson product reflect 'form follows function'. Dyson products all contain some scientific innovation which ensure that they perform very well. The visual shape of the Dyson product is not normally given the same attention.</p> <p>A clear and detailed analysis of how Dyson product reflect 'form follows function' with specific examples for reference. Dyson products all contain some scientific innovation which ensure that they perform very well. The DC01 required 5127 prototypes suggesting Dyson worked tirelessly to get it working perfectly. The 'above the line' visual shape and aesthetics of the Dyson product is not normally given the same attention to the same depth as below the line factors and so the statement is generally true of Dyson products.</p>		<p>0</p> <p>1-2</p> <p>3-4</p> <p>5</p>

		AO3	AO4	Mark
(c)	The Design Council encourages designers to 'Discover, Define, Develop and Deliver'. Evaluate how this is reflected in the iterative design process. Marks will be awarded for the content of the answer and the quality of written communication.	✓		[10]
	<p>Answers relating to the evaluation of how the iterative design process can be seen as discovering problems, defining specifics, developing and refining solutions and presenting a final outcome to solve the problem, should be awarded up to 10 marks. QWC is also assessed here.</p> <p>Guidance:</p> <ul style="list-style-type: none"> Discover can be seen in the iterative process when designers are seeking problems The discovery of possible design tasks within contexts The exploration of the needs and wants of the user allows designers to discover essential aspects of the problem Define is to fix a design brief regarding an identified problem Define will also include the design specification – a list of success criteria by which designing will be measured. Develop is the generation of a wide range of initial ideas. These are then modelled, tested and evaluated to identify areas for improvement. As the iterative cycle continues, the solution improves and becomes refined. Deliver is manufacturing the prototype and presenting this to the users The testing and evaluation of the final prototype with the users allows the assessment of how well the solution answers the problem. <p>No answer or no relevant information presented or discussed.</p> <p>Brief description, very little detail of evaluating how 'Discover, define, develop deliver' relates to the iterative design process. Quality of Written Communication is basic, presenting occasionally appropriate material with some coherence, some errors of grammar, punctuation and spelling.</p> <p>Some detail with some evaluation of how 'Discover, define, develop deliver' relates to the iterative design process. Quality of Written Communication is good, presenting mainly appropriate material in a coherent manner, few errors of grammar, punctuation and spelling.</p> <p>A clear and detailed evaluation of how 'Discover, define, develop deliver' relates to the iterative design process. Quality of Written Communication is good, presenting mainly appropriate material in a coherent manner, few errors of grammar, punctuation and spelling.</p> <p>A fully clear and very detailed evaluation of how 'Discover, define, develop deliver' relates to the iterative design process, with reference to stages of the iterative process and how they fulfil the 4 Ds. Quality of Written Communication is very good presenting wholly appropriate material in a coherent and logical manner, hardly any errors of grammar, punctuation and spelling.</p> <p>A highly clear and fully detailed evaluation of how 'Discover, define, develop deliver' relates to the iterative design process, with specific reference to stages and activities of the iterative process and how they fulfil the 4 Ds. Quality of Written Communication is excellent, presenting wholly appropriate material in a coherent and logical manner, no errors of grammar, punctuation and spelling.</p>			0 1-2 3-4 5-6 7-8 9-10
			Total	20

Question 6

The images below show the final prototype of an eco menu holder designed and made by a student.		AO3	AO4	Mark
(a) (i)	The back of the menu holder is made from reclaimed laminate flooring. Explain how this can be considered sustainable.		✓	[4]
	<p>Answers relating to reasons for flat-packed box should be awarded up to 4marks.</p> <p>Guidance:</p> <ul style="list-style-type: none"> • Reusing the reclaimed laminate flooring saved procurement of new materials. • Reusing reclaimed laminate reduces waste, saves waste at landfill or reprocessing energy. • Reusing reduces carbon footprint of the old and new product • Cradle to cradle approach • Supports Government initiatives to use less energy / materials • Waste laminate floor boards are not discarded or disposed of responsibly or not e.g. recycling centre / fly tipping. • Supports 'eco' approach as suggested. • Cheaper to reuse reclaimed material than to purchase new material • Supply is quick – no need to order materials / wait for delivery. <p>No answer or no relevant information presented or discussed. 0</p> <p>Simplistic or basic response Cheaper to use waste materials than buy new 1 Or Better for the environment because it's not thrown away 1</p> <p>More detailed explanation or response. Reusing waste materials reduces waste that needs disposal and also reduces new materials required. 2</p> <p>A detailed explanation or response. Reusing the waste laminate flooring reduces waste which would go to recycling or landfill and also reduces the amount and cost of new materials required. 3</p> <p>A fully detailed explanation or response. Reusing the waste laminate flooring reduces waste which would go to recycling or landfill and also reduces the amount and cost of new materials required. This has a positive impact on carbon footprint by using a cradle to cradle approach. 4</p>			

		AO3	AO4	Mark
(ii)	The legs of the menu holder are made using a laser machine and from 3mm plywood. Describe two advantages to the designer of using laser cutting to make the legs.		✓	2 x [2]
	<p>Answers relating to the advantages to the designer of using laser cutting to make the legs should be awarded up to 2 x 2 marks.</p> <p>Guidance:</p> <ul style="list-style-type: none"> • All legs cut using the laser cutter will be identical and fit together with other legs perfectly. • Design drawings (CAD files) can be sent directly to laser cutter with very little time wasted. • Designs can be realised quickly and efficiently, much faster than using manual labour. • The laser cutter will cut through 3mm ply in one pass, with very little finishing required providing the correct settings are used. <p>No answer or no relevant information presented or discussed. 0</p> <p>Simplistic or basic response The laser cutter will cut them out quickly 1 Or All the legs will be the same 1</p> <p>More detailed explanation or response. The laser cutter will cut through 3mm ply in one pass, with very little finishing required providing the correct settings are used. 2 Or Design drawings (CAD files) can be sent directly to laser cutter with very little time wasted. 2 Or All legs produced by laser cutter will be identical and fit together perfectly using the slot cut in both legs. 2</p>			
(iii)	Describe how a restaurant's logo could be added to the legs when laser cutting.		✓	[2]
	<p>Answers relating to describing how a logo could be added using laser cutting should be awarded up to 2 marks.</p> <p>No answer or no relevant information presented or discussed. 0</p> <p>Simplistic or basic response The logo could be engraved when laser cutting 1 Or More detailed explanation or response. The logo could be engraved using a different coloured layer than the leg outline so that it would not be cut out. 2</p>			
Total				10