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Application of research

Fruit Juicer Project



This is the original design for the base of the juicer. The main problem with this is that it will be difficult to get the juice to pour out of the hole into a glass. It would be much more efficient to have the juicer raised and the juice to pour out the bottom. This will help the juicer fit the specification better as one main point was that the juicer was easy to use.

After discussion with my client we decided that the base should be as simple as possible with a lip underneath and on the top for a stand or a guard to fit around. The floor of the base has a slight angled dip downwards towards the centre to try and help let the juice flow to the hole. The hole itself does not go all the way through the base but inside it are smaller holes to help siphon the juice of rips and pulp which was a stated specification point earlier.

Here we can see that the hole for the juice to come out of has now been moved down to the bottom. The floor of the base also has a curved dip leading into the hole. This is to help the juice flow down into the hole. A guard has also been placed around half of the tank, this is to help stop juice squirting out whilst the fruit is being crushed. However my client does not like the idea of a guard so we are going to have a guard that can be removed.

Here we can see how the support and guiding rods will be attached to the base and the top disk. First a clearance hole for a screw is drilled into the components. Then a hole is drilled halfway through both pieces for the rods to fit into.

After this, holes are drilled in both ends of all the rods. These holes are then tapped with the right thread diameter as the screws that will go in them. The poles are then placed into the base and top disk, and screwed tightly in to hold the juicer together.

Here the inverse of the plunger head has been put inside this base. This is to help extract as much juice as possible. The problem with this design though is that most the juice will collect around the sides of the bottom where there is nowhere for the juice to go, thus making it very difficult to get the juice out.

This is how my client wanted the plunger rounded and fixed the end. This is so through the force it is easier to juice, outward shape to assist if the sides the plunger can be used.

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Final design solution

- A manufacturing specification that comprehensively addresses the needs and wants of the client/end user is presented that includes comprehensive technical details to allow fully accurate interpretation by a third party
- Sophisticated refinement of design proposals to generate a design solution that comprehensively meets the requirements of the design specification
- Accomplished project management including application of calculations to determine material quantities and costs related to the production of the prototype, showing a thorough understanding of methods which can be applied to reduce wastage

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Final design solution

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A manufacturing specification that comprehensively addresses the needs and wants of the client/end user is presented that includes comprehensive technical details to allow fully accurate interpretation by a third party.

AND

Sophisticated refinement of design proposals to generate a design solution that comprehensively meets the requirements of the design specification.



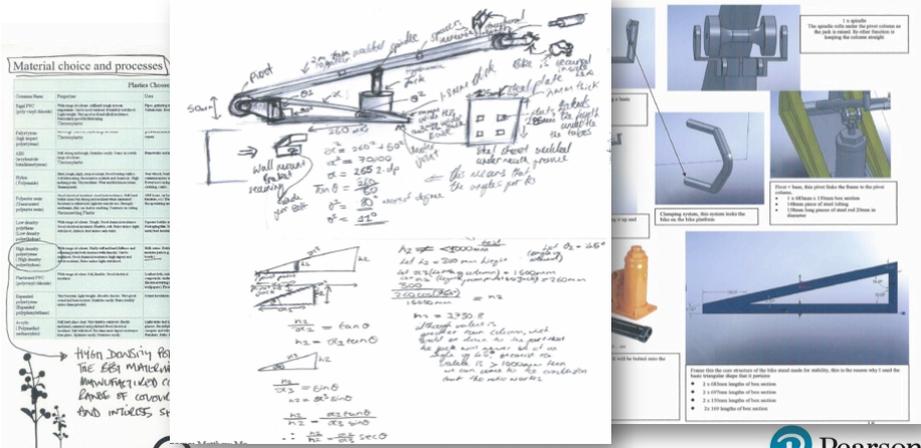
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Final design solution

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Accomplished project management including application of calculations to determine material quantities and costs related to the production of the prototype, showing a thorough understanding of methods which can be applied to reduce wastage.



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Review of development and final idea

- Comprehensively developed analysis of the refinements made to designs through the development process, pertinently supported by references to feedback made by others and consideration of materials, components and manufacturing techniques
- Perceptive and balanced evaluation of the refinements made to designs through the development process, which is used to draw perceptive conclusions about the appropriateness of the final prototype in meeting the needs of the specification
- Comprehensively developed analysis of the designs and prototypes made by others, which considers a comprehensive range of factors and makes comprehensive connections between elements of the design
- Perceptive and balanced evaluation of the designs and prototypes made by others, which is used perceptively to inform their own design decisions

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Review of development and final idea

25. Final Design & Its Evaluation

After developing my initial idea I came to my final design proposal. I used idea 3 because it matched all of the requirements, compared to all of the other designs, 1, 2 and 4. Both my client and I felt that idea 3 had the greatest potential to be developed into a design which would suit my clients needs and become a viable product. The design allows for relatively easy manufacture as jigs are used. Although the design is fairly complex and there are numerous parts I feel that I will be able to complete the product to a high standard, in a fairly short space of time. I have sourced the materials and will be reducing the costs of my product where ever possible to reduce the overall cost to my client and make the product more viable as a business opportunity. Now that I have fully developed my idea I will be evaluating it against my specification to ensure that all spec points have been addressed. Through fulfilling all of the design criteria I can ensure that the design will suit the needs of my target market.

Specification Points	Design	Questionnaire
Purpose/Int'ion 1. The lamp should be environmentally friendly.	1. Through the choice of materials, the production techniques employed and the energy used from the solar panels it is possible to say that the design will be environmentally friendly and will have minimal impacts of the environment.	Questionnaire 1 will be using a questionnaire to evaluate certain aspects of my specification. I will be surveying 20 people who are in my target market, this will include my client.
Form 2. The design should consist of a mixture between straight edges and organic shapes.	2. The lamp consists of a mixture between curved section and straight. The curved sections are present in the curved aluminium and in the aluminium stand. The straight section is found in the base and on the curved section ends and between the aluminium.	3. Does the design look original, stylish and professional looking?
User Requirements 3. The design should be original, stylish and professional looking. 4. The design should be aesthetically pleasing and suit the surrounding area. 5. Variation in colour and materials should be incorporated into the design (black/white, wood/metal) this will improve aesthetics.	3. From the questionnaire I discovered that 80% of my target market said that the design looked original, stylish and professional looking. 4. From the questionnaire I found out that 90% of my target market said that the design look aesthetically pleasing and suited the surrounding area. 5. There is clear evidence of variation in materials and colour in my product, the most prominent being the contrast between the aluminium stand and solar panel and the use of the rosewood. My client and I feel that the mixture is highly desirable and suits his taste.	4. After showing a picture of the area which the lamp will be placed in asked, does the design look aesthetically pleasing and suit the surrounding area?
Performance Requirements 6. The lamp should be bright enough to ensure ease of reading. 7. The lamp must be adjustable. 8. The lamp must be durable enough to withstand knocks and have a long lifespan. 9. The lamp must be able to withstand a fall from 500mm. 10. The design should use either energy saving, low energy bulbs or LEDs to reduce the impact on the environment.	6. I will use a questionnaire to test this spec point. This will be conducted after manufacture of the light. 7. The design is very adjustable with the sliding curved aluminium allowing the focus of the light to be directed to achieve maximum lighting where it is needed. 8. I will be performing a drop test from 500mm after manufacture to ensure that the lamp can survive the fall. I feel that the materials and joints used this will be easily achievable. 10. The design uses LEDs which will reduce the impact on the environment.	1 YES 2 NO
Materials and Components 11. The design should have an on/off switch on either the mains cable or the lamp itself. Another alternative includes the lamp being inside into a touch lamp to operate the switch. 12. A proportion of the materials used in the product must be sustainable or consider sustainability. A proportion of the materials used in the product must be able to be recycled. The materials should be used carefully to ensure that little waste is left. 13. The mains cable must be at least 1800mm long. 14. The design must suit the surroundings. To do this I will incorporate wood into my design.	11. The design has the on/off switch located on the mains cable which allows ease of use. 12. All of my materials have been chosen with sustainability in mind. The aluminium stand and rosewood feet both energy which has an additional effect on the environment. I used rosewood instead of solid rosewood to reduce the weight of the rosewood growing wood. I used LEDs which have an extremely long lifespan which will mean that they use less energy overall. 13. I will measure the cable to ensure it meets the minimum dimensions. 14. The design does use wood however I will be using a questionnaire to test whether the design suits the surroundings after manufacture.	1 YES 2 NO
Size 15. The lights base must not exceed 250mm x 250mm.	15. The base is circular and has a diameter of 140mm.	
Safety and Quality 16. There should be no sharp edges which could potentially harm people. 17. The light must have a stable base to ensure the lamp does not become unbalanced and falls over which could potentially harm people and damage the lamp or the customers property. 18. There should be no loose parts or parts easily broken which could be ingested by children or animals alike. 19. The lamp should not be so hot it could burn easily and be a danger to people and property. 20. The electricity must be safe and insulated to ensure that the user cannot be shocked by the electricity.	16. I will be using a questionnaire to test this spec point. This will be carried out concurrently manufacture. 17. I will be using some quality tests to check this point which will include attempting to knock the top and/or tilt it to knock the light over. My prototype showed the circular base was the most stable. 18. I will use a questionnaire to test this spec point, this will be done after manufacture. 19. I will be performing a 'knock' test to ensure the lamp is not too hot, this will be done after manufacture. 20. I will be performing safety inspections and have a trained electrician to also inspect my work to ensure that the lamp is safe after manufacture.	
Scale of production 21. Less energy consuming methods of production must be used where possible. 22. The product should include at least one method of batch production.	21. I have chosen less energy consuming methods in my product where ever I was able to do so. I was able to use more practices in the production due to the energy produced from the solar panels on the solar roof. 22. The main aspect of the design includes the curved aluminium section. This was essential when creating a jig which was used to produce identical aluminium in the same curve which allowed fast and accurate manufacture. The jig will be recycled within the school to help produce other students work and therefore the materials I used will not simply be wasted.	
Cost 23. The lamp should cost no more than 80 pounds.	23. The total cost of manufacture is £72.30.	

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Communication of design ideas

- Perceptive selection and accomplished use of traditional/ manual graphical techniques to communicate design proposals
- Perceptive selection and accomplished use of computer-aided design (CAD) techniques to communicate design proposals
- Perceptive selection and accomplished use of written techniques to communicate design proposals

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Communication of design ideas

RESEARCH 2D & 3D



3D DEVELOPMENT

Section C - Design & Development



3D FINAL PRESENTATION

Section C - Design & Development



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Tools and equipment edexcel

- Sophisticated selection of materials, fixtures, components and fittings which are fully appropriate for the final prototype, showing an in-depth understanding of material properties, the requirements of the end user, and the intended purpose of the prototype
- Accomplished use of tools, equipment and techniques to prepare materials for the manufacture of the prototype, showing an in-depth understanding of the need for dimensional and geometric accuracy
- Demonstrate a consistently high degree of safe working practice for self and others

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Tools and equipment edexcel



PHOTO DIARY

Section E - Making



The three of the four pieces of pre-cut high-strength adhesive applied to the top of them.



These were then all compacted together to make a tight bond to be formed.



The template for the base was printed off thermal ink so there had adhesive spray applied onto it.



This was then attached to the top of the Base. This was done using the special adhesive that dried.



Following the template of the base, the shape of the base was cut out using the sharp edges of the Base.



Using the paper template, the base was then taken to the Bobbin Cutter, to smooth the edges of the Base.



The electric sander was then used to smooth the edges of the Base to a perfect finish.



The sander with fine sand finished the top edge of the Base.



The Innocent brand name was printed off from CAD and then attached to the pre-cut strips using adhesive spray.



The inner circular parts of the Base were then cut out using the roller die. This was done using the '10' and the '100' different 'N's.



The rest of the brand name was finished out partially using the 'Powered' function.



Each letter was then carefully filed with various grades of fine grit of fine cutting tools and to sharpen all of the edges.



The eight edges of the label were smoothed using a file and Dry Block whereas the curved edges were smoothed using a piece of fine sand increasing grain of size and dry 600, 800 and finally 2000.



All of the edges that had been smoothed then. This made all of the edges of the label sharp.



The template of the logo was printed off and then cut out. This was then applied to the pre-cut orange material using adhesive spray.



Two small holes were drilled into the internal space of the Innocent logo, one in the top part and the other in the hole above the 'Pure Fruit'.



The Backs of the Powered Fruit Base was smoothed using fine blocks and then used to cut out the internal shape of the Innocent logo. After this the internal angles were then cut out.

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Iterative manufacture?

Garden Sun Lounger: Manufacture

The form had to be strong like this on the centre table as it would provide the best finish, as another way would be to use CAH to produce them. Unfortunately however this would have been to be of a lesser quality due to the limited size of cutting tools.

Here we set the glass and wood blocks without on the table center table as it was more suitable for the wood center table and further shaping.

Here we set the feet on cylindrical supports on the wood table. These were shaped down from the cylindrical supports using turning tools. These are to be cut from point to point and across the width.

Here we set the laminated design. This holds the entire stand on place by using the weight of the user to push down on the wood of the lounger. As the flexion between the two pieces of wood will cause the laminates to stay in place without the need of any other type of fitting.

Here we set the form after it has been made ready to have the laminates, slatted and glued into position or can be used multiple times.

Here we show the just made to design and make for the sections of the feet. This is because the feet's change shape but they could not provide a fit right to judge the cutting on. The feet were the feet to be cut through the laminates and for them to be cut correctly and accurately.

WHICH METHOD I USE IN FACT. This is a simple one using two pieces of it and cutting them into it. Then from laminating them and use of the curve and that form the curve in the form and this is the laminated process for my product but I can't.

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Quality and accuracy

- Produce a prototype that demonstrates accomplished making skills at an advanced level in relation to a sophisticated design problem
- Produce a fully functional prototype which matches the end user needs
- Produce a prototype that fully meets the design specification
- Sophisticated application of an iterative approach to manufacture to produce a prototype

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Quality and accuracy v demand? edexcel



Produce a prototype that demonstrates accomplished making skills at an advanced level in relation to a sophisticated design problem




Quality and accuracy edexcel



Manufacturer: For Suncor

Design brief: To design an manufacturing parts and a presentation case as an executive gift

Client name: RICHMOND PENS LTD

group:

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Testing and evaluation

- Comprehensively developed analysis of the prototype, taking into account refinements implemented during the development and the client/end user specification, showing a perceptive approach to testing against most measurable criteria
- Perceptive evaluation of the prototype, taking into account the iterative design process and the intended purpose of the prototype, drawing balanced conclusions from testing against measurable criteria
- Comprehensively developed analysis of the social, moral, ethical and environmental impact of materials and manufacturing processes of the prototype
- Perceptive evaluation of the social, moral, ethical and environmental impact of the prototype




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Testing other prototypes

Garden Sun Lounger: Testing

Garden Sun Lounger: Testing



Specification
Must be able to support the weight of a person and a dog. Must be able to support the weight of the user off of the ground.

How to test each point

- Place a scale and the user on the hammock to see if the product can withstand the weight without the usual twisting, the usual hammock twisting, or the usual twisting/turning over.
- See if the design supports the weight of the user and remains suspended in the air.

Garden Sun Lounger: Evaluation

Personal Evaluation

I like that the design is simple and easy to use. It is also very comfortable and easy to set up. I like that the design is simple and easy to use. It is also very comfortable and easy to set up.

Client Evaluation

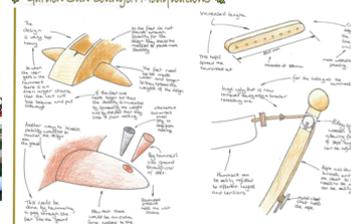
I like that the design is simple and easy to use. It is also very comfortable and easy to set up. I like that the design is simple and easy to use. It is also very comfortable and easy to set up.

Garden Sun Lounger: Modifications



Client Evaluation

I like that the design is simple and easy to use. It is also very comfortable and easy to set up. I like that the design is simple and easy to use. It is also very comfortable and easy to set up.



Technical Drawings

Labels include: Hammock Straps, Hammock Ropes, Hammock Fabric, Hammock Support, Hammock Frame, Hammock Hangers, Hammock Ties, Hammock Clips, Hammock Buckles, Hammock Rings, Hammock Hooks, Hammock Latches, Hammock Locks, Hammock Keys, Hammock Handles, Hammock Grips, Hammock Pads, Hammock Mats, Hammock Pillows, Hammock Blankets, Hammock Covers, Hammock Bags, Hammock Cases, Hammock Boxes, Hammock Trunks, Hammock Backpacks, Hammock Bags, Hammock Cases, Hammock Boxes, Hammock Trunks, Hammock Backpacks.




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