

DESIGN AND MANUFACTURE

TASK 2

DESIGN UNIT

DUTCOME 1-2



The candidate will have demonstrate that they have identified and researched the relevant design factors which includes, in this task, issues of sustainability and recycling. These will be summarised.

D1.1, D1.2, D1.3, D1.4, D1.5



The candidate will have incorporated research findings into a design proposal for the TABLE.

The candidate will have used a range of 2D

D1.6

and 3D graphic and modelling techniques to show their ideas for the table and will conclude which idea best meets their specification through evolving work. The candidate will have planned the

construction of the model with little or no guidance whether physical and/or computer

modelling.

D2.1, D2.2



Design decisions will be justified. The final concept will have been presented and independent planning for manufacture will be evident.

D2.3



DESIGN AND MANUFACTURE

TASK 2

MATERIALS & MANUFACTURING DUTUDME2-4



In the proposal for manufacturing of the table the candidate will have confirmed their ability to independently select the appropriate materials including potential variation for component parts. They may have drawn upon prior experience of materials in selecting them appropriately according to a range of factors.

MM1.3, MM3.1

Recommending final selection of materials for manufacture of component parts of prototypes and explain why the selection of materials is appropriate in terms of aesthetics, workability, practicability, function and performance.

MM 1.1 1.3 1.4 1.5

Using correct names and terminology when referring to materials and their properties. Selecting tools and equipment for manufacturing tasks based on information given in working drawings for prototypes and materials selections.

MM 2.2 2.3 2.4

Producing manufacturing plans which incorporate requirements for tools, equipment, materials and fixings, as well as manufacturing techniques and processes.

MM3.1 3.2 3.3 3.4 3.5

Evaluating the prototype and outlining Suggestions for improvement in terms of craftmanship and finish.

Recommending changes in design that would improve the commercial manufacture of the prototype as a product in terms of economy, efficiency and sustainability.

MM 4.2 4.3









SITUATION

A local company designing and manufacturing small coffee tables has recently found that sales of its products have fallen.

Without an increase in sales it is likely that the company will stop trading.

In the past the company has relied on its existing traditional (old fashioned) furniture. However, a recent survey has shown that customers prefer modern, stylish designs.

A survey carried out by the company shows that the most popular furniture is relatively cheap to purchase and easy to put together. Some potential customers prefer to buy flat packed furniture.

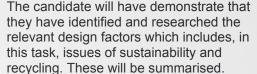
It is also well known that potential customers often access the Internet to research furniture before visiting a retail outlet.

DESIGN BRIEF

I am going to design and manufacture a working prototype of a product which is modern and stylish. The product will be eye catching ,modern and appeal to a younger generation. The product will be mainly manufactured in natural or man made wood.

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You will undertake and be assessed on the task of designing and manufacturing a modern table.

In this ta	sk you will undertake the following activities	DESIGN	MATERIALS & MANUFACTURE
Activity 1	Produce a design brief	D 1.1	
Activity 2	Research against chosen design factors	D1.2	
Activity 3	Summarise your findings of research in a variety of ways	D1.3	
Activity 4	Produce a specification for the product against your design factors and research	D1.4	
Activity 5	Through graphics and modelling assess your designs	D1.5 1.6, 2.1 2.2	
Activity 6	Justify your design with reference to your design factors	D2.3	
Activity 7	Choose the best materials for your prototype and identify potential impacts of design decisions. Show awareness of re-cycling sustainability in decisions taken.		MM1.3, 3.1

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Activity 8	Recommend final selection of materials for the prototype in terms of aesthetics and the design factors.		MM1.1, 1.3, 1.4, 1.5
Activity 9	The correct terminology to be used when referring to materials and properties.		MM2.1,2.3, 2.4
Activity 10	Produce Manufacturing plans / component parts.		MM3.1
Activity 11	Manufacture a prototype.		MM3.2,3.3, 3.4,3.5
Activity 12	Evaluate product in terms of improvement.		MM 4.2, 4.3

MATERIALS & MANUFACTURING DUTUDME2-4



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ACTIVITY 1 ANALYSE THE BRIEF

Analyse the design brief by:

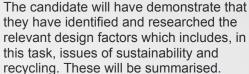
- Reading and deciding the most important design factor.
- Write out the design brief
- To help you do this, develop a mind map.

You may wish to use a table similar to the one below to indicate why

DESIGN FACTOR	REASON WHY THIS IS IMPORTANT

DESIGN UNIT

DUTUDME 1-2



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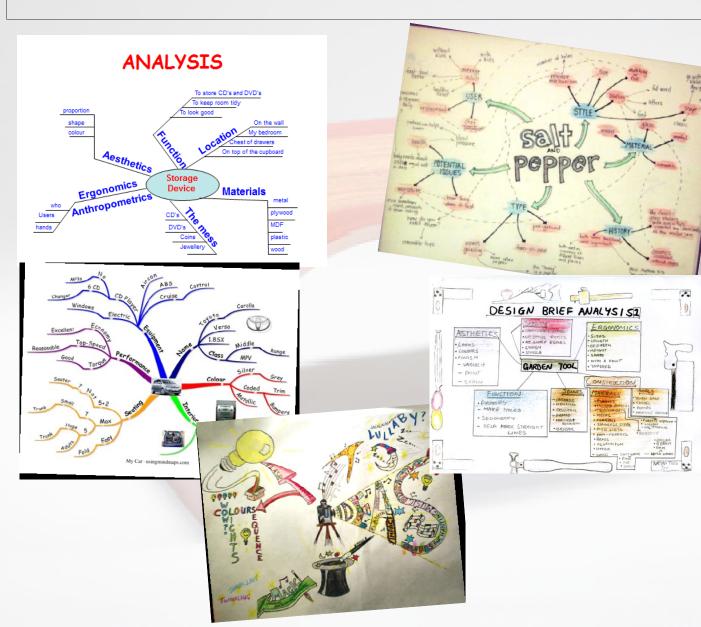




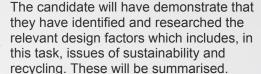




MIND MAP EXAMPLES



DESIGN UNIT DUTUME 1-2



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ACTIVITY 2 RESEARCH



Using a range of methods begin to research against your chosen design factors. To do research into the design factors for the modern table you may use:

- The internet (Product ideas, products on the market, fixing, manufacturing, assembly, materials for sustainability).
- Measure and record (What are the needs for the table, where is the table to be situated, who is to use it?).
- Questionnaires and surveys (What do people like/dislike about the table, what do they want to store on the table?).
- Data (Ergonomics and anthropometrics).



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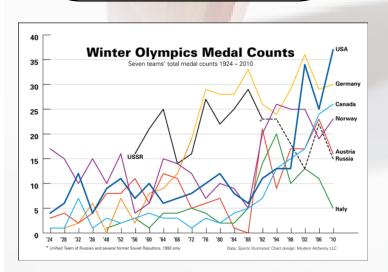
ACTIVITY 3 SUMMARISE FINDINGS

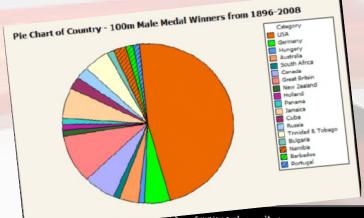
From your research, you now need to produce a summary of your findings. This will be a bringing together of the most Important bits of your research that is to be included in a specification.

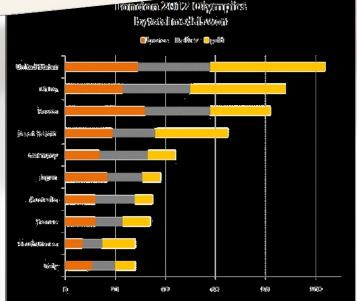
Try to display your findings in the best way for the Information.

You can use:

- Tables.
- Charts.
- Graphs
- Written Reports.







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ACTIVITY 4 SPECIFICATION

In this activity you must now use your findings to write a detailed specification.

Write at least two to three specification points for each of your design factors.

Function/Performance

- Must hold many objects.
- Must hold objects of different. shapes and sizes.
- The objects must be easily placed and removed from the product.

Materials

- Must be made mostly from WOOD.
- Must be made of at least two wood joints.
- Must be recyclable.
- Must be inexpensive.

Aesthetics

- Must be good to look at.
- Materials to be used must add quality and decoration.

Production Processes/Manufacturing

- Must be made accurately and be well finished.
- Must be made using the correct wood working techniques.

Safety

- Must be safe for all, especially young children.
- Must be robust (should not fall apart or have small parts).
- Must be stable when holding objects.

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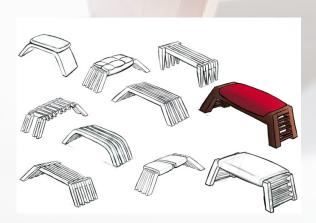


ACTIVITY 5 INITIAL IDEAS

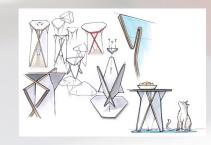
It is now time for you to generate a selection of ideas.

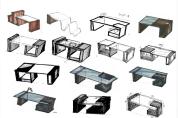
You can communicate your ideas using a range of techniques

- Sketching/drawing freehand and/or technical (orthographic, exploded, perspective, isometric, 2D or 3D)
- Presentation drawing rendering
- Using resources from the market (printed sheet)
- Computer modelling CAD
- Physical modelling card, paper, plasticine, wood, metal, or plastic



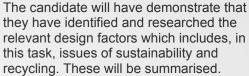






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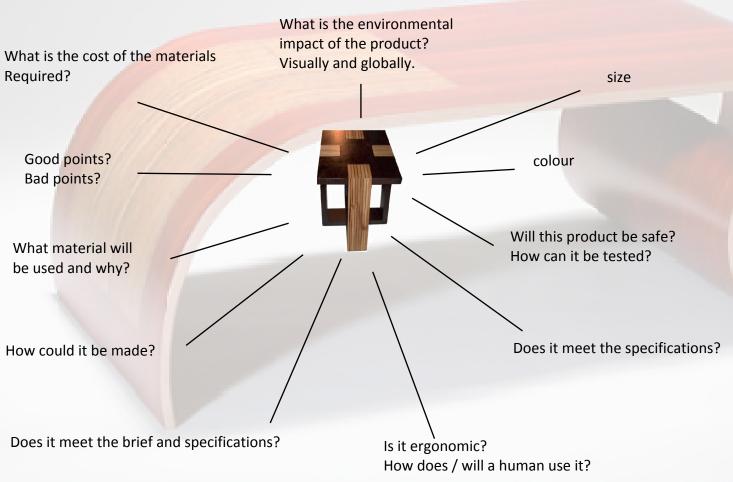






ACTIVITY 5 DEVELOPING IDEAS AND ANNOTATIONS

Your design drawings do not always give the reader all of the details you have thought about. Annotations can help get your thoughts across.



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ACTIVITY 6 JUSTIFY YOUR DESIGN

Justify your decisions for the final idea. Design factors should be clearly considered and link your ideas back to the specification.

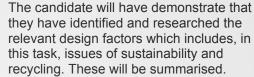
You should give reason for choosing a final idea and summarise with a conclusion. You can represent your justification using a table or chart support with a written statement.



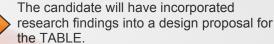
Conclusion: summarise your reasons for selecting or not selecting an idea.

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ACTIVITY 7 CHOOSE MATERIALS

Justify your decisions for the final idea by selecting and choosing the correct materials which are likely to satisfy the requirements of a table design.



RECYCLING & SUSTAINABILITY

How will it be made?
What materials are used?
How affordable? Can you get the materials easily?

Identify potential impacts of design on the environment





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ACTIVITY 8 / 9 EXAMPLES



FOAM COVERS MADE FROM RECYCLED TEXTILE MATERIAL.

STEEL FRAME RECLAIMED FROM SCRAP STEEL.

FOAM MANUFACTURED FROM NON-TOXIC MATERIALS.

RECLAIMED RUBBER (FROM OLD TYRES) USED INSTEAD OF PLASTIC WHICH IS MANFACTURED FROM OIL.

RECYCLED PARTS / COMPONENTS: WHERE POSSIBLE PARTS SUCH AS HINGES, SCREWS AND ELECTRONIC COMPONENTS WILL BE RECLAIMED FROM OLD/RECYCLED PROJECTS AND USED IN THE MANUFACTURE OF

MY PRODUCT.
THIS MEANS COSTS WILL BE KEPT TO A MINIMUM AND THIS ALSO REDUCES.
THE NEED FOR NEW PARTS.

NON TOXIC MATERIALS

NATURAL, SAFE MATERIALS WILL BE USED WHEN MANUFACTURING MY PRODUCT. TOXIC PAINTS AND VARNISHES WILL NOT BE USED WATER BASED FINISHES WILL BE USED WHERE POSSIBLE NATURAL WOODS RATHER THAN MAN-MADE PRODUCTS WILL BE USED WHERE APPROPRIATE.

PACKAGING: ALL PACKAGING WILL BE MANUFACTURED FROM RECYCLED CARD. RECYCLED POLYSTYRENE WILL BE USED IN \$10 E THE PACKAGE, SURROUNDING THE PRODUCT TO PROTECTION.

OZONE FRIENDLY MATERIALS WILLBEUSED (NO CFC GASES) PRODUCT RECYCLING: IT WILL BE POSSIBLE TO RECYCLE PARTS FROM MY PRODUCT WHEN IT IS READY FOR DISPOSAL IN A FEW YEARS TIME. IT HAS BEEN DESIGNED WITH ITS DISASSEMBLY AND DISPOSAL IN MIND.

GOOD QUALITY, LONG LASTING, CHAIR MEANS IT WILL NOT

NEED REPLACING FOR A LONG

NATURAL DYES USED IN SEAT

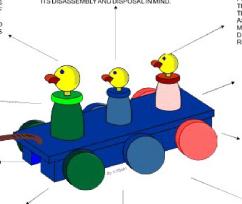
CHAIR PACKAGED IN CFC

HARM TO OZONE LAYER.

FRIENDLY MATERIALS - NO

TIME, SAVES ON MATERIALS

IN THE FUTURE.



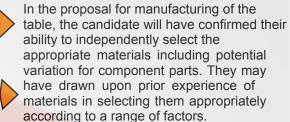
SUSTAINABLE FORESTS: WOODS FROM SUSTAINABLE FOREST WILL BE USED. THIS MEANS THE WOOD FOR MY PRODUCT COMES FROM FORESTS THAT ARE BEING FARMED: IN A WAY THAT ENSURES TREES ARE PLANTED AS OTHERS ARE CUT DOWN. THIS MEANS THE FOREST IS NOT DESTROYED BUT CONTINUALLY REPLACED.

ENVIRONMENTALLY FRIENDLY
MANUFACTURES IN Y PRODUCT WILL BE
MANUFACTURED IN A FACTORY THAT
LIMITS AND MONITORS POLLUTION AND
REDUCES ENERGY USE AND MATERIAL
WASTE

PCB / CRCUIT BOARD: THE PRINTED TO GROUT BOARD WILL BE DESIGNED TO BE AS SMALL AS POSSIBLE. REDUCING THE USE OF PCB BASE DM ATERIALS WASTE FROM THE MANUFACTURE OF PCBS IS DANGEROUS TO THE ENVIRONMENT. A SMALLER PCB REDUCES POSSIBLE POLLUTION AND ENVIRONMENTALDAMAGE.

ENERGY CONSUMPTION: MY PRODUCT

MATERIALS & MANUFACTURING DUTUDME2-4



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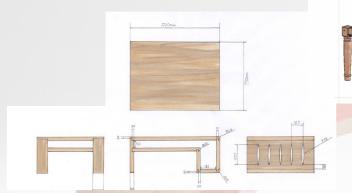


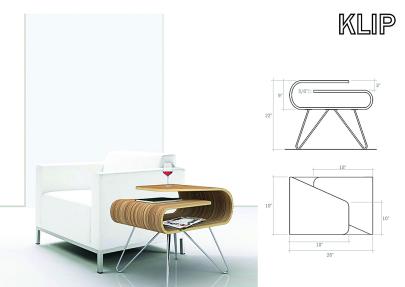


WORKING DRAWINGS **ACTIVITY 10**

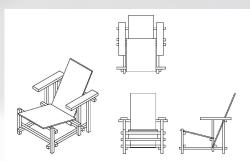
Draw out ORTHOGRAPHIC DRAWINGS showing the table from the top and front showing the main dimensions. This drawing has to supplemented with other drawings showing how the table is to be constructed showing all

sizes to assist with construction.









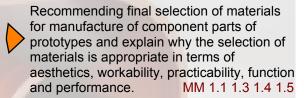
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ACTIVITY 11

MANUFACTURE PROTOTYPE

Assembling and joining component parts, resulting in a functionally sound prototype generally free from faults demonstrating skill in the safe use of tools and equipment.

Finishing assembled prototypes with well prepared surfaces to a high standard.

Cutting, shaping and finishing component parts of prototype prior to assembly demonstrating precision in the safe use of tools and equipment.

Preparing and marking materials for component parts, which are accurate and generally free from faults.

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Producing manufacturing plans which incorporate requirements for tools, equipment, materials and fixings, as well as manufacturing techniques and processes.

MM3.1 3.2 3.3 3.4 3.5



Evaluating the prototype and outlining Suggestions for improvement in terms of craftmanship and finish.

Recommending changes in design that would improve the commercial manufacture of the prototype as a product in terms of economy, efficiency and sustainability.









ACTIVITY 12 EVALUATION

Evaluate your pen holder prototype by:

Evaluating your planning for manufacture. Outline suggestions for improvement in terms of practicalities and efficiency.

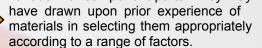
Evaluating your clock prototype in terms of the build quality and finish by making suggestions for improvement.

- What are your initial thoughts of the final design? What changes would you make next time?
- Are you happy with the materials you chose ? Would you use different materials?
- Is the colour scheme exactly what you expected? What alterations would you make?
- Did the project take too long to make? Would this alter the cost of manufacture?
- Is your solution safe? Could it be made safer?
- Are the building processes you used to make your solution okay or would you make it differently next time?
- Is the solution the right size/shape?
- What are the views of your peers regarding your design?
- Does it work? What changes are required?
- Does it fulfil the SPECIFICATIONS

MATERIALS & MANUFACTURING DUTUDME2-4



In the proposal for manufacturing of the table, the candidate will have confirmed their ability to independently select the appropriate materials including potential variation for component parts. They may have drawn upon prior experience of



MM1.3, MM3.1



Recommending final selection of materials for manufacture of component parts of prototypes and explain why the selection of materials is appropriate in terms of aesthetics, workability, practicability, function and performance.

MM 1.1 1.3 1.4 1.5

Using correct names and terminology when referring to materials and their properties. Selecting tools and equipment for manufacturing tasks based on information given in working drawings for prototypes and materials selections.

MM 2.2 2.3 2.4



Producing manufacturing plans which incorporate requirements for tools, equipment, materials and fixings, as well as manufacturing techniques and processes.

MM3.1 3.2 3.3 3.4 3.5



Evaluating the prototype and outlining Suggestions for improvement in terms of craftmanship and finish.

Recommending changes in design that would improve the commercial manufacture of the prototype as a product in terms of economy, efficiency and sustainability.