

# Year 11 GCSE DT Knowledge organiser Spring Term

## Non Exam Assessment (NEA)

This term you will make your product independently using manufacturing skills relating to your chosen material area (Wood, metal or Plastic.) Once built your prototype project will be evaluated against the specification, tested and surveyed to gain the opinions of others.

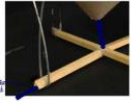
## Section E: Realising design ideas (20 marks)

### Section D: Developing design ideas (20 marks)

To get the maximum marks you need to produce:

- Very detailed development work using a wide range of 2D/3D techniques (including CAD where appropriate) in order to develop a prototype.
- Excellent modelling, using a wide variety of methods to test their design ideas, fully meeting all requirements.
- Fully appropriate materials/components selected with extensive research into their working properties and availability.
- Fully detailed manufacturing specification is produced with comprehensive justification to inform manufacture.


**Model 1**




From the peer evaluation they commented on how the cable would be managed. To fix this I would have it coming out the cone's tip then going through the bottom of a wooden base at the back. This means the cable will be out of the way and not getting tangled up.

I would put a thin metal sheet at the back of the light so that the projected light is directed just towards one area of the room. The sheet would need to be more than halfway round the light to do this. This was an issue brought up by the client if they were going to buy lights for a Boarding House room.

The light would need a way of being able to rotate when it needs changing. The easiest way would be to have a hinge attached to the light so it isn't lost or damaged. I would add a hinge to the light to change the bulb. The hinge might look a bit like so as to not affect the aesthetics of the light.

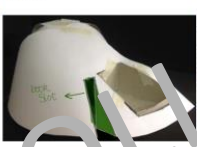


**Model Development**

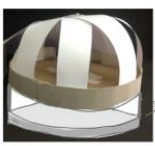


This development is an idea from the peer evaluation group and they suggested making the dome higher and having a storage box underneath. This would provide more storage space which is useful as the light takes up quite some space on a table. The storage space would be useful to slide in a book or a phone to hold or protect.

**Model 2**



I would add one or more book slots in the back side of the light as an additional feature. This would give the back additional use aside from just directed light only at the user. There could be several slots for more books but they might need more support. The client brought up having a book stand when asked about other functions.



**SUMMARY:** Following the model development of two of my models, I have decided to choose Model 1 to develop as my final product. I came to this decision after looking at several ways both models could be developed and the first model will be most appropriate as a light for my client. This model also refers closely to my design specification and can be developed even further to make it completely suitable.

### Your tasks:

- Use photographs and drawings of your models to complete the design development section of the NEA.
- Describe every picture to get your ideas across
- Write about things that are good with your design. Highlight things that need to be improved. Suggest ways you will improve them
- Include additional sketches to show how you will modify your design as you move on to the next stage of making
- Annotate your drawings and photographs to show what materials will be used and details of how you will make it (naming tools, joining methods, describe the process of how it will be made)
- Produce a final design drawing (or model) and annotate it fully using ACCESSFM (this will be your "Manufacturing specification")
- Add a summary and client feedback on every slide!



[Follow these links to an ACCESSFM worksheet](#)

### Section E: Realising design ideas (20 marks)

To get full marks in this section you need to make your final model to a high standard and show:

- The correct tools, materials and equipment (including CAM where appropriate) have been consistently used or operated safely with an exceptionally high level of skill.
- A high level of quality control is evident to ensure the prototype is accurate by consistently applying very close tolerances.
- Prototype shows an exceptionally high level of making/finishing skills that are fully consistent and appropriate to the desired outcome.
- An exceptionally high quality prototype that has the potential to be commercially viable has been produced and fully meets the needs of the client/user.


### Your tasks:

- Use photographs and drawings of your final model to show the quality of the work
- Annotate your photographs to show what materials are used and detail how you made it (naming tools, joining methods, describe the process of how it was made)
- Include a summary and feedback from your client.


**TOP**

1. For all the 3D printed components I exported my CAD drawings as .stl files then opened them on makerware to be printed. I have a total of ten 3D printed components.

2. I spray painted two of 3D printed components; I chose two different blues that suited my colour scheme.



3. Three components needed to be laser cut so I exported my CAD drawings as .dxf files and created the components to be transferred to the laser cutter.

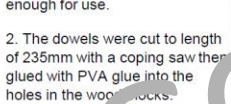


4. The plywood components were sanded together on the belt sander then had to be oiled with Danish Oil and the polypropylene had to be folded on the indents.


**Manufacturing Diary**

**BASE**


1. I cut two 40x20x200mm meranti blocks using a tenon saw then I drilled the holes for the dowels and acrylic supports. After this, I sanded both pieces with sandpaper till it was smooth enough for use.



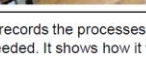
2. The dowels were cut to length of 235mm with a coping saw then glued with PVA glue into the holes in the wood blocks.



3. I sanded the edges of the base so the dowels would push into the wood. Then I was oiled with Danish Oil and when it was dry, I added four feet to the meranti blocks and screwed the four support brackets.




4. I cut four acrylic rods with a coping saw and sanded the edges with the disc sander so they were smooth.




**ASSEMBLY**


1. The polypropylene diffuser is attached to the shade with four nuts and bolts. These are then attached to the plywood components with four nuts and bolts.



2. The four corner clips slide onto each corner and fit above the corner holes. The light bracket just sits inside the shade.



3. The base is already assembled and just needed to fit the four acrylic rods into the support brackets and fix them to the top support clips.



**SUMMARY:** My manufacturing diary records the processes to make my light including the different programmes, tools and equipment needed. It shows how it was made and also how it was finally assembled to complete the light.



<https://youtu.be/4uWfo4NK6Gs>



<https://youtu.be/AfKbYcS4RXo>

Follow these links to see videos of how to make woodwork joints