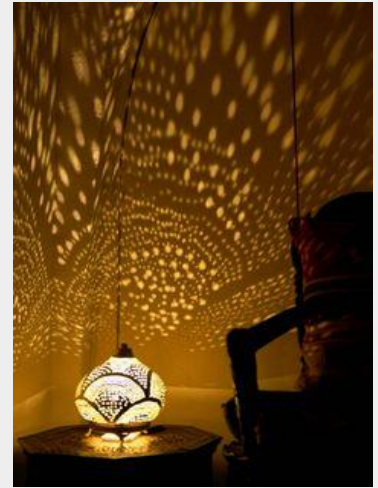# NIGHT LIGHT Project

BY MACY WHITE

Year 9 - Lighting

Lighting plays an important role in our lives and takes the form of many different types of lighting. If light is required at night, instead of switching on the main light it is handy to have a small night - light on a nearby bedside cabinet.

Brief: *Your task is to research, design and make an imaginative night light suitable for a particular user of your choice, e.g. night-lights are often used in children's bedrooms to make them feel more secure and provide low level background lighting.*

Your work will be assessed using grades 1-5 (1is the top grade) and you will be compared against others in the **whole year group.**

All assessments are explained on the Assessment Sheet displayed on the wall and are similar to those used in the school reports.

SELF ASSESSMENT

Use the list shown below to help you check that you have all your folio work and that you have put it in the right order.

Compare your work with the notes on each topic and the work of others in the class. Give each a grade from:

1 – very good,   2 – satisfactory,   3 – needs improvement, X– missing.

FOLIO WORK

TOPIC NOTES	Grade
Design Process – good understanding.	
Research – good understanding of the purpose of research.	
Analysis – detailed notes on an existing product to help you understand and aid your design.	
Mood Board – wide range of thinking extended form example given.	
Specification – a clear list of what the lighting should do.	
Graphical techniques – good quality, accurate drawings and shading.	
Ideas – a range of interesting ideas, with good shading and notes to help explain.	
Development – development of the 'look' & style, with good shading and notes.	
Presentation Drawing - a neat, 3D drawing with realistic materials shading..	
Planning – a list of the making processes using notes and sketches and quality control details.	
CAD/CAM – an accurate drawing/outcome of your acrylic top.	
Testing/Evaluation – a detailed judgement of how successful your work is.	
Modification – detailed suggestions as to how your design could be improved	
Your opinion- Your chance to give your views about the project	
Average grade	

PRACTICAL WORK

TOPIC NOTES	Grade
Organisation – how well you have organised yourself and used your time	
Independent working – did you need much help and support	
Tools and equipment – correct, skilful and confident use	
Accuracy and skill – accuracy of marking out, cutting, drilling, joining etc	
CAD image- design, quality and layout of display image.	
Manufacture – quality, accuracy of the joints, PCB, soldering, CAD/CAM.	
Safety – using tools and machines correctly and safely.	
Quality of finish – work to be free from marks, smooth and look of 'shop' quality.	
Average grade	

Write a **sentence** to explain what you are best at and what you need to improve.

In folio work I am good at ………..

In practical work I am good at ………..

In folio work I need to improve ……………

In practical work I need to improve ……………

TASK: List possibilities for each of the following then underline your final choice:

USER?	LOCATION?	AESTHETICS?
Friends	Bedroom cabinet	Friendly
Parents	Table	Sporty
Siblings	Living room	Scary
Children	window	Traditional
Older generation	Bathroom	Child friendly
Teachers	Desk	
Sport people		
Teenagers		

To fulfil the **BRIEF** you will need to work your way through the **DESIGN PROCESS.**

TASK: Complete the diagram below.

TASK: Explain in your own words what you have been asked to do.

BRIEF
I have been asked to create a night light. The purpose of the night light is to give off a dim glow, to allow babies to feel safe in the dark, or for people who read. The nightlight will run on battery and we have to create a circuit board.

EVALUATION
- Evaluation
- Test
- Quality control

The Goal

RESEARCH
- Analysis
- Specifications
- Research
- Planning

MANUFACTURE
- Development
- Quality control
- Modifications
- CAM

DESIGN
- Initial ideas
- Final ideas
- CAD

Specifications, Development, Analysis, Test, Research, Modifications, Planning, Evaluation, Initial ideas, Final Idea, CAD, CAM, Quality control.

Research is the process of gathering and processing information. Designers conduct research in order to gain a greater understanding of the problem/brief they are designing for.
Designers need to be able to analyse existing products, and be aware of new technologies and consumer demand for new products.

TASK: Set yourself two targets to complete as you work through the research section of your project.

1) In order to make the most creative night light I will need to research different styles of night lights. I can do this by using Google, I will research different styles and topics for my chosen user and possibly create a mood board. Another way to develop my idea is looking on Pinterest or mood boards. After my research my ideas may change and develop. For instance I could change the base material or shape.

2) For my second target I will research different logos or themes. This will give me a wide range of option to choose from. For instance if I chose a logo or brand , I would research different items that brand has produced eg: clothes, shoes, bags etc. I would also have a look at the brands colours and add the colours to my lamp.

Did you meet your targets?

_____
_____
_____
_____
_____

Product Analysis

A **Product Analysis** is an example of **primary research,** it involves looking closely at existing products in order to understand how they work and how they can be improved. To successfully design your light you need to ask the right questions about the **function, purpose, shape, form, colour , material** and **texture,** of the existing product**.**

TASK: Using full sentences put into your own words what a product analysis is?

_____
_____
_____
_____
_____

TASK: Read the detailed description of the light below carefully.

Doulex Human Shaped Automatic Light Control Night Light
Material: lamp holder - PPT, ABS; lamp head – ivory white glass
Size: 8cm * 5cm * 12cm
Weight: 100g

The human-shaped night light can produce weak lighting during night time, when the room turns to dark the small night light will emit soft light automatically. When the environmental light becomes brighter, the night light will shut down automatically too. This funky night light is convenient and at the same time will not affect normal rest.

Functions:
1. Barrier free lighting;
2. Intelligent control (no switch): When the light dims, the night light will light up automatically; When the light gets brighter, the night light will turn off automatically.
3. Long useful life: can work more than 50,000 hours.
4. Broader applications: used widely in bedrooms, living rooms, bathrooms, hotels, bars and offices.
Price - £2.50

TASK: Using your own observations and the information found above, analyse the light in the photograph below. Use the headings to help you annotate the image.

FUNCTION

The product barriers free lighting with intelligence control. So when the light dims the light comes on. The lamp can work more than 50000 hours. This product can be used in a variety of rooms.

PURPOSE

The lamp is created to give off a dim light. For different purposes. Eg: children, or lighting up a hallway etc.

FORM

This product has been purposely curved to look like a man. The light colours makes it look more expensive and draws less attention to the product. The White bulb has been curved which compliments how the product looks.

COLOUR

Body is badge with a white bulb.

TEXTURE

The material is plastic, therefore the product would be smooth. The product is very curvy with no odd bumps or edges. The rounded bulb makes the bulb look more like a man. The smooth appearance gives it a friendly appearance..

MATERIAL

The materials for this product is.PPT , ABS. The light bulb is created by white ivory glass.

CONSTRUCTION

The product has been put together to have an appearance of a man pulling out the plug. The plastic would have been molded to look like a man.

TASK;

Put yourself in the position of a retailer who will be selling the *Doulex Human Shaped Automatic Light Control Night Light.* It is your job to write a catalogue entry that promotes the key feature of the light. Use the space below to write a 1st draft. Do not forget to use VCOP.

1ST Draft

This Doulex Human Shaped Automatic Light Control Night Light is the easiest night light around. This extremely durable product can last up to 50,000 hours, giving you a high quality product!! The night light consists intelligent control lighting , meaning you never have to worry about saving battery. This modern night light only comes on due to the lighting in the room. This friendly human shaped nightlight is suitable for all target users, giving off a soft warm glow. This product can be used in a variety of different rooms and is easily able to be moved. The product is plastic concluding that the light won't heat up causing no burns or scalding. The Doulex product is safe for children and animals. The product is badge meaning it goes with every colour and opinion! The best part is that it's only £2.50! So buy your Doulex Human Shaped Automatic Light Control Night Light today!!!!

Swap your booklet with a partner, proof read and suggest changes.

TASK:

Now that your 1st draft has been checked and suggestions have been made by your partner, redraft it below with changes. **HW-** Type up final draft using ICT.
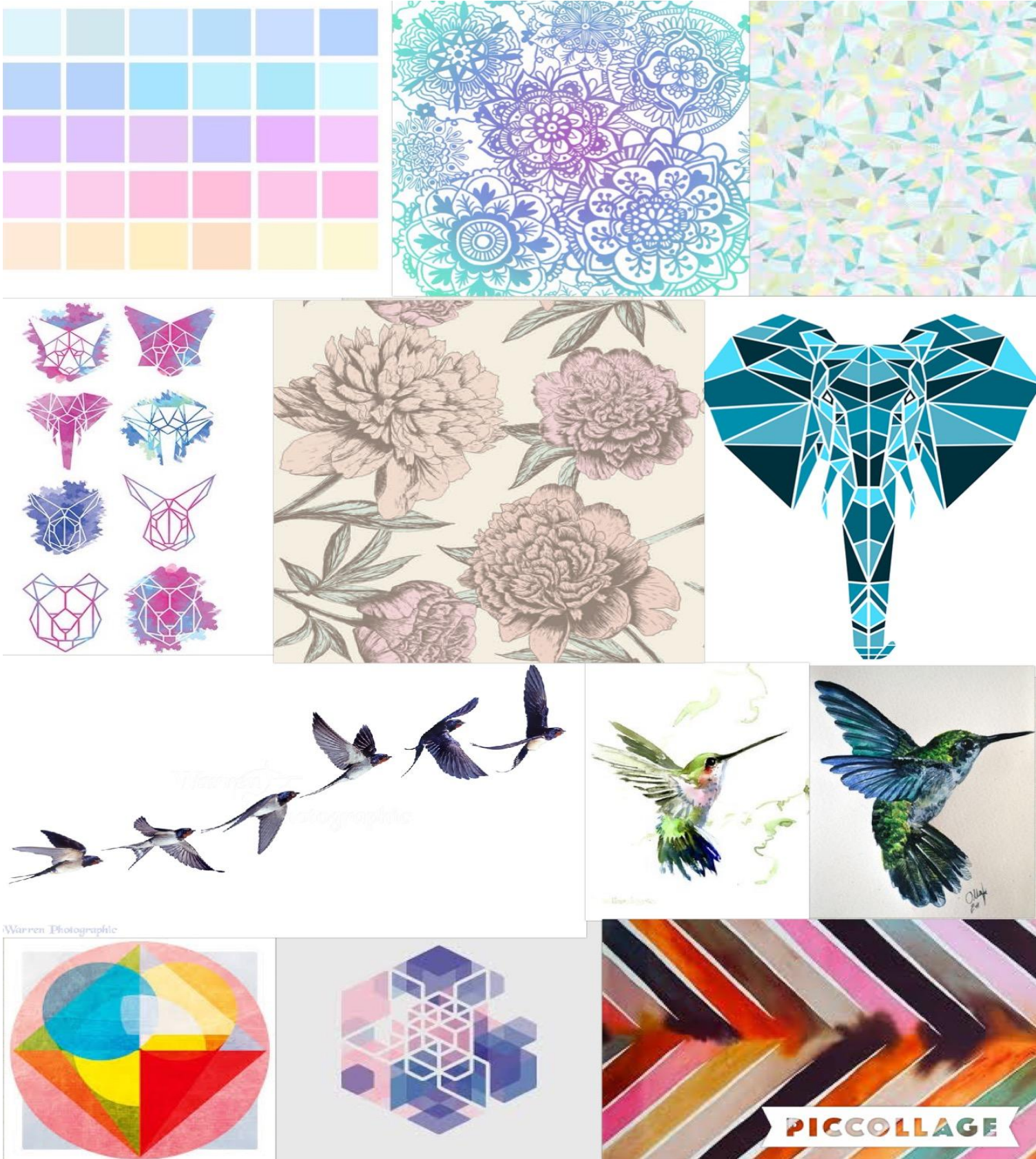
2nd DRAFT

This Doulex Human Shaped Automatic Light Control Night Light is the easiest night light around. This extremely durable product can last up to 50,000 hours, giving you a high quality product! The night light consists intelligent control lighting , meaning you never have to worry about saving electricity. This modern night light only comes on due to the lighting in the room. This friendly human shaped nightlight is suitable for all target users, giving off a soft warm glow. This product can be used in a variety of different rooms and is easily able to be moved. The product is plastic concluding that the light won't heat up causing no burns or scalding. The Doulex product is safe for children and animals. The product is badge meaning it goes with every colour and opinion! The best part is that it's only £2.50! So buy your Doulex Human Shaped Automatic Light Control Night Light today !!!!

Mood Board

As a designer you will create a mood board which will help to define the look of your lighting. A **mood board** is a type of poster design that may consist of images, text, shapes, colours, atmospheres, materials and textures. Example: summer, bright daylight, green and yellow, youth and sports.

Task: Collect images which may be of use to you when you are designing your light; arrange your images/pictures in an attractive way on an A4 piece of paper.

BUY NOW

THE DOULEX HUMAN SHAPED AUTOMATIC LIGHT CONTROL NIGHT LIGHT!!

This Doulex Human Shaped Automatic Light Control Night Light is the easiest night light around. This extremely durable product can last up to 50,000 hours, giving you a high quality product! The night light consists intelligent control lighting , meaning you never have to worry about saving electricity. This modern night light only comes on due to the lighting in the room. This friendly human shaped nightlight is suitable for all target users, giving off a soft warm glow. This product can be used in a variety of different rooms and is easily able to be moved. The product is plastic concluding that the light won't heat up causing no burns or scalding. The Doulex product is safe for children and animals. The product is badge meaning it goes with every colour and opinion! The best part is that it's only £2.50! So buy your Doulex Human Shaped Automatic Light Control Night Light today !!!

Specifications

A specification is a list of **detailed statements** that tell you the designer exactly what the product has to do. You must create your own specification.

TASK: Below are some headings to help you write your specification. In your own words describe what each of the following words means.

Function: How the product operates.

User: The person who will use the product.

Control: The way the product can switch on and off.

Cost: The price of product.

Materials: The materials used to create the product eg: plastic, metal etc.

Construction: How the product is put together.

Aesthetics: How the product looks, feels, smell etc.

Finishes: The final layer of product eg ; wax , vanish etc.

Size: The length, width mass or height of the product .

Quality control: Checks made to ensure everything is accurate and to a high standard.

Safety: If the product the is safe to use. Ensure the product is put together probably.

Ergonomics: When your product suits all users eg; size of hand, height of user etc.
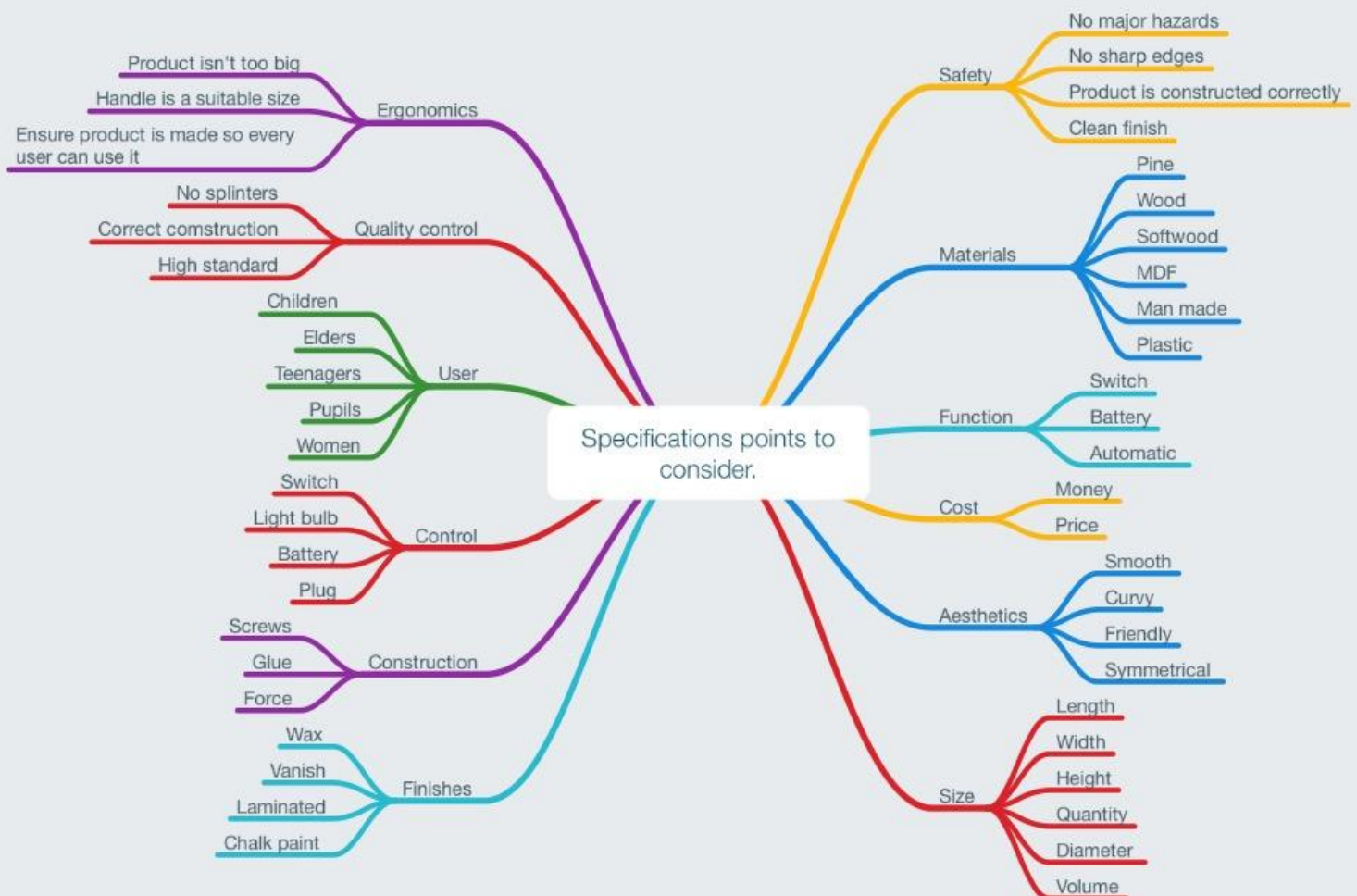
TASK: You should be able to write a specification point for each of the previous headings in relation to your night light. Pick at least **6** headings that you would consider to be the most important. Explain in **detailed** sentences that fully describe your design intentions, and put them in **order of importance.** Make sure you use your **brief** & **research** to help you.

1st Draft

1. My night light must contain a floral, nature theme.
2. My night light must light up a small area in a room.

3. My night light must provide a soft glow to enable me to see in the dark.

4. My night light must be controlled by a rocker switch, to make it easy for my user.
5. My night light must suit my target user's preference.

6. My night light must use the material pine wood to create my base of my light.

7. My night light must be finished to a high standard , I can do this by sanding all edges down and checking my circuit board.

8. My nights lights,circuit board must work successfully to enable me to use it .

2nd Draft

1. My night light must contain the theme of flowers and birds, preferably a hummingbird to give a natural effect.
2. My night light must provide a soft glow to light up my bedroom. I will place it on my windowsill.
3. My night light must provide a soft glow to enable me to see in the dark.
4. My night light must be controlled by a rocker switch to allow my user to turn it on and off easily.
5. My night light must suit my target user of a young girl child. I can do this by using feminine colours.
6. My night light must use the material of pine wood , to create the base if my box. The material wood suits my theme of nature.
7. My night light must be finished to a high standard , I can do this by sanding all edges down and checking my circuit board.
8. My night lights circuit board must work to enable my user to use it .

Gwaith Dosbarth/Cartref
Extension Task: Use your ICT skills to type up your developed specifications

Drawing Practice-Graphical Techniques
TASK: Label each picture with the correct name and complete the drawing in the space provided. Don't forget to add shading.
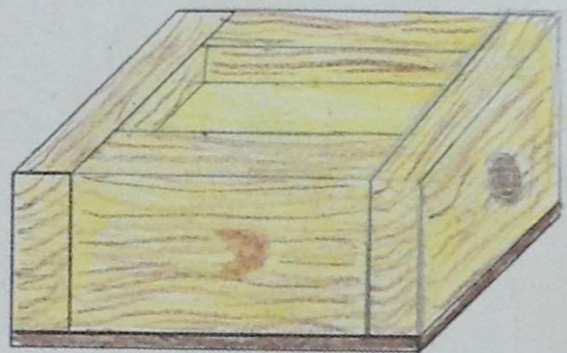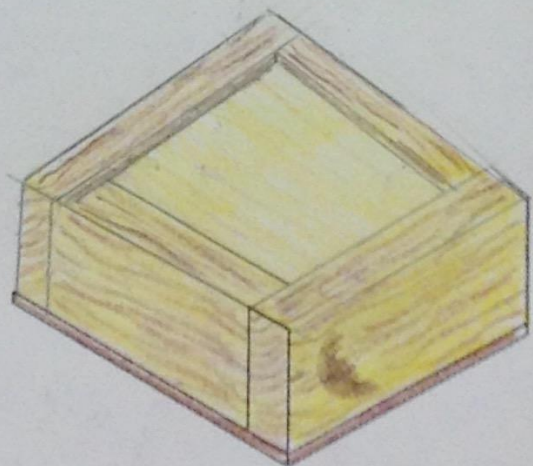
1)_____
ORTHOGRAPHIC

2)_____
OBLIQUE

3)_____
ISOMETRIC

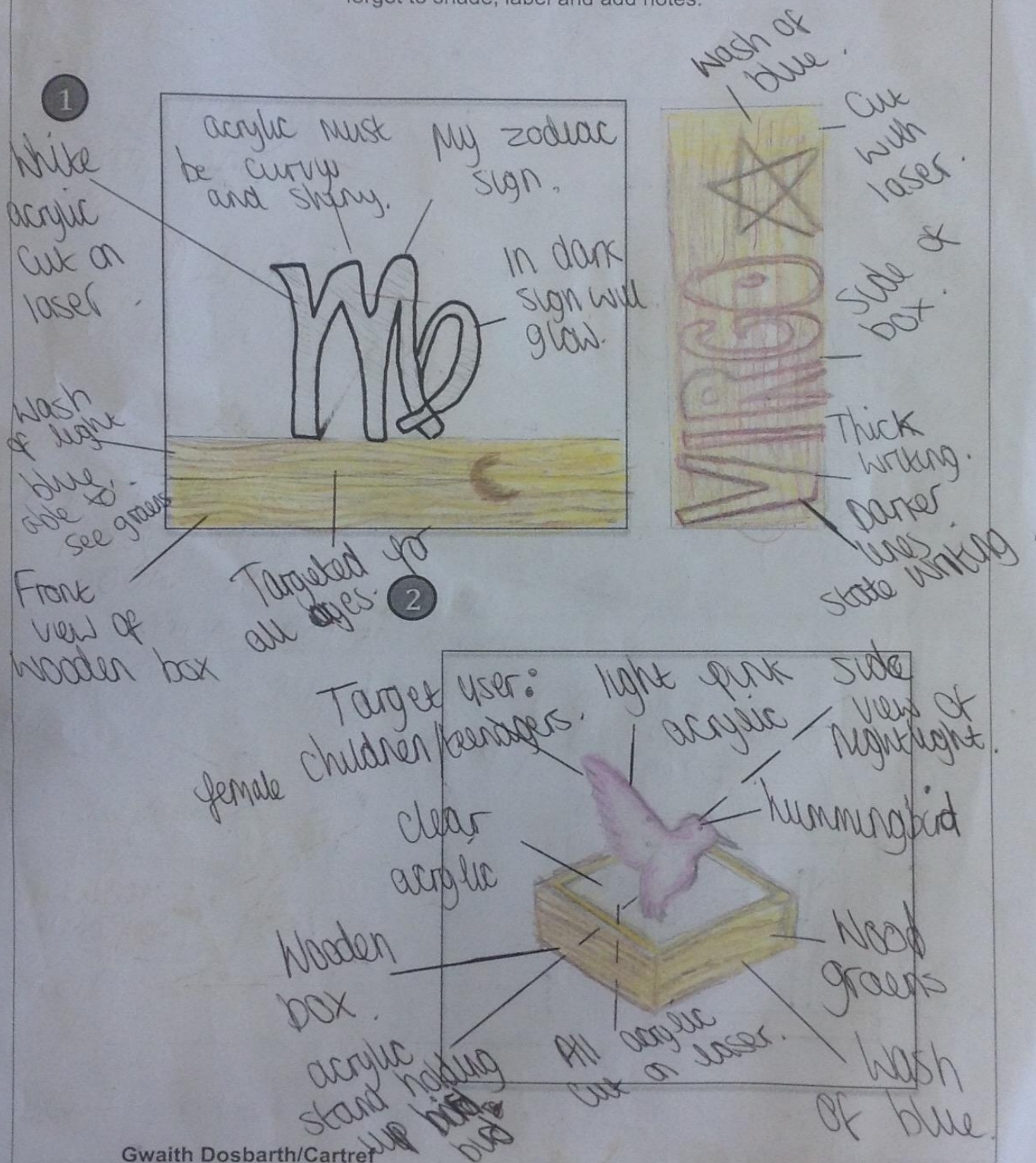**Resistant Materials** **Design**

Initial Design Ideas
TASK: Use the **4** templates below to design the acrylic section of your night light. Don't forget to shade, label and add notes.
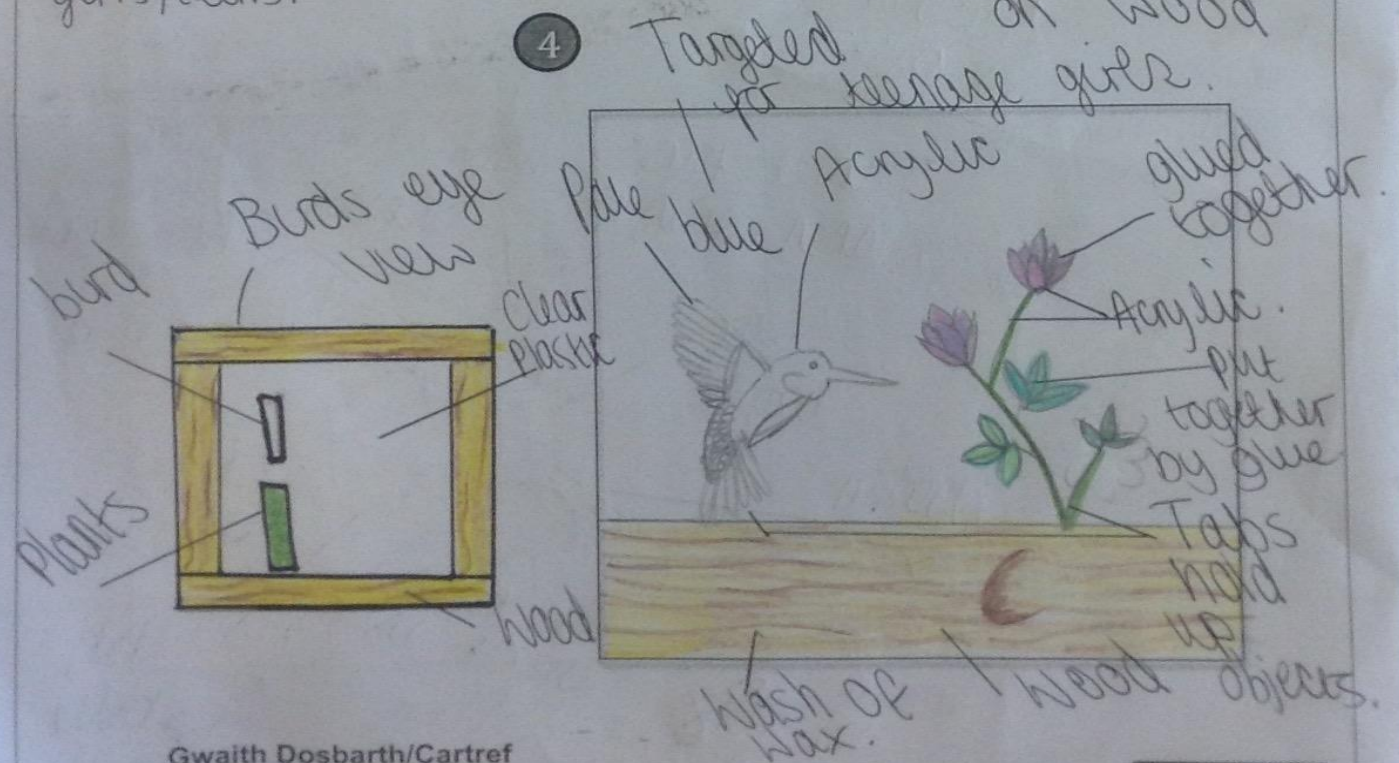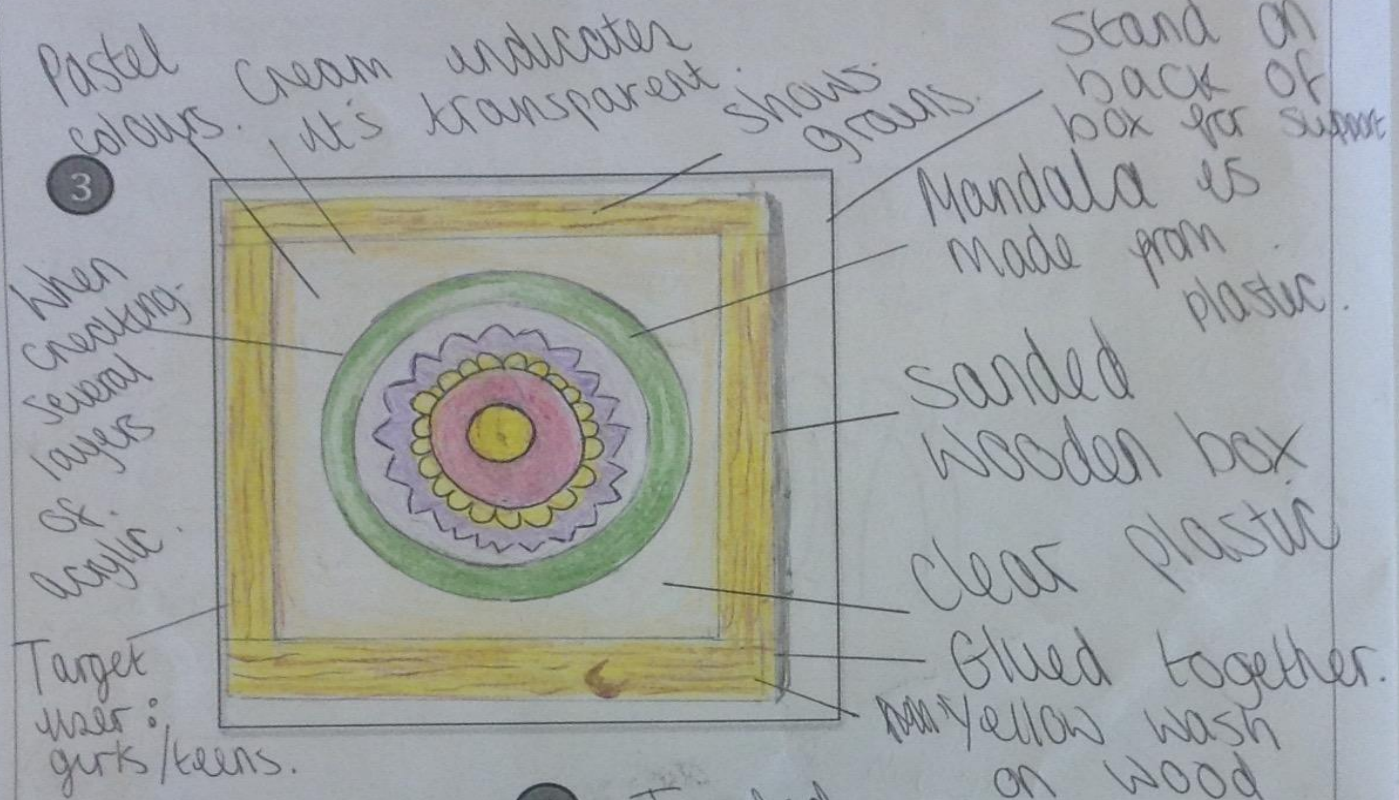
1

White acrylic cut on laser .

Wash of light blue to . able to see graes

Front view of wooden box

acrylic must be curvy and shiny.

My zodiac sign .

In dark sign will glow.

Targeted for all ages.

Wash of blue .

Cut with laser .

Side of box .

Thick writing. Darker lines. State writing .

VIRGO

2

Target user: female children/teenagers.

clear acrylic

Wooden box .

acrylic stand holding up bird

light pink acrylic

All acrylic cut on laser.

Side view of nightlight.

hummingbird

Wood graens

wash of blue.

Pastel colours. Cream indicates it's transparent.

shows grains.

Stand on back of box for support

Mandala is made from plastic.

③

When checking several layers of acrylic.

sanded wooden box

clear plastic

Glued together.

Target user: girls/teens.

non yellow wash on wood

④ Targeted for teenage girls.

Birds eye view

Pale blue Acrylic

glued together.

bird

Clear plastic

Acrylic.

put together by glue

plants

Wood

Tabs hold up wood objects.

Wash of wax.

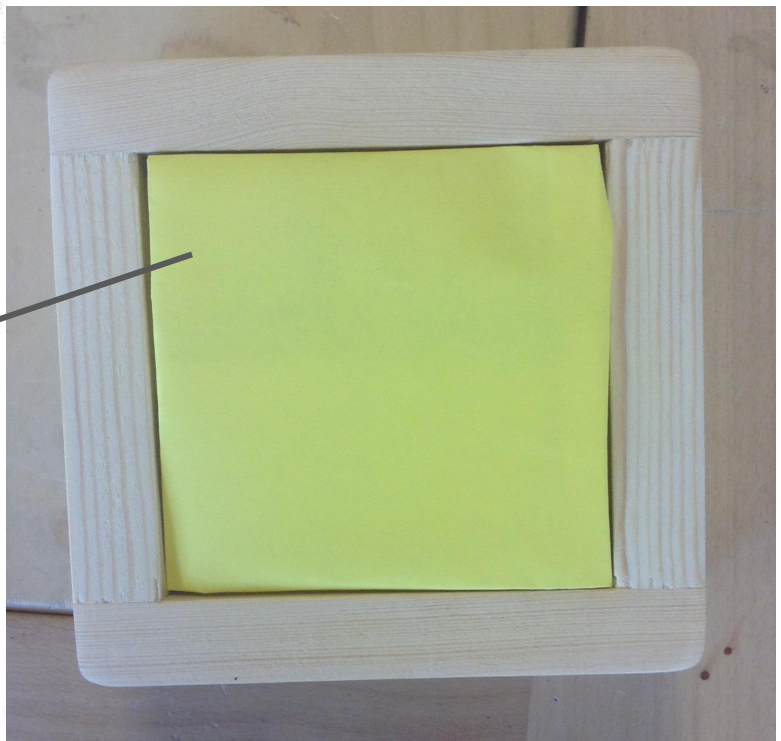Gwaith Dosbarth/Cartref

Lighting

Design Development

I created a paper model of my design. This will help me to see how to structure my design and what resources I need to gather. In this paper model , I cut out several layers of paper to form my plant and bird. By doing this I know how many different shapes I need to cut out on the laser. On the back of my box I created a triangular stand, this stand has to be made out of wood or acrylic be yes it needs to be strong to support my box.

1

When making this wooden box, I nailed the wood together and sanded down the edges to give a smooth curvy appearance. When creating my model I will coat the box with wax and varnish to make the wood grains stand out. I will put clear acrylic where the yellow paper is . On top of the clear acrylic I will put my bird and plant. To put the birds and plant on the clear acrylic I will use pva glue. If I use nails the acrylic may crack, so it is best to use strong glue.

2

Gwaith Dosbarth/Cartref

Since my paper model. I have changed my design . I decided to change the way the bird is placed on my box. Originally I wanted my bird to lie on the bid and then tilt the box diagonally . However I've changed it so my bird will be stood upright by a clear acrylic stand. The reason I've changed my design is due to the colour of the base. It is clear so if my box was tilted diagonally you could see the battery and wires.

Spellings

The following words are used often in design & technology and it is important that you know how to spell them and understand what they mean, or the context in which they are used. These words build upon the terms you learnt last year.

You should read through the following and learn the spellings, if you do not understand what they mean or are, you should either look them up in a dictionary, review your design folio or ask your teacher (before the test is due).

Try square	**Numerical**
Marking gauge	**Oblique**
Evaluation	**QC (Quality control)**
Symmetry	**Contrasting**
Dust extraction	**Hazardous**
Laser cutter	**Liquid cement**
Isometric	**Development**
Aesthetics	**Ergonomic**
Bradawl	**Evaluation**
Specification	**CAD**
Manufacture	**CAM**
Accurately	**Dimensions**

Planning

When making (manufacturing) your design it is important to plan the order in which you will make each part. We often do this in our heads, but this can lead to mistakes. In order to avoid this it is important to follow a plan.

TASK: Complete the materials list table below with ALL the component you will need.

Materials (Cutting list)

Part	No.	L(MM)	W(MM)	T(MM)	Material	Source
1.						
2.						
3.						
4.						
5.						
6.						

Making Plan

*TASK:*Here you are to write out your plan using words and drawings. The headings in the boxes show the information you should have in each box – fill as many boxes as your plan requires. For each process add a QC (Quality check) to ensure that your work will be of good quality.

Example: *Collect material*
Equipment: *Try square, Zero end rule, pencil, saw.*

To do: *Select material and cut to sizes on the cutting list.*

QC: *Check marking out before cutting.*

Time needed: *15 min*

| **Step 1):**	Assemble box
Equipment:	Pencil, try square , zero end ruler
To do:	Mark out where the panel pins are going to go using a ruler.
QC:	Ensure measurements are accurate before
Time needed:	drilling.

10 minutes.

CAD/CAM

CAD:_____   Example :_____

CAM:_____   Example :_____

In your own words explain what CAD/CAM is:

CAD/CAM stands for computer-aided design and computer-aided manufacturing. It's a software we use in school.
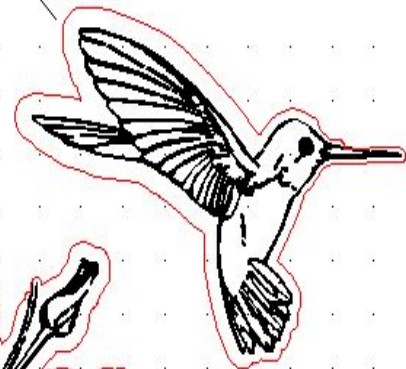
TASK: Using 2D – Design, draw your acrylic components complete with final design. All the dimensions you need to complete this drawing are given below. You may wish to do some calculations and write down some added dimensions to help you complete your CAD drawing.
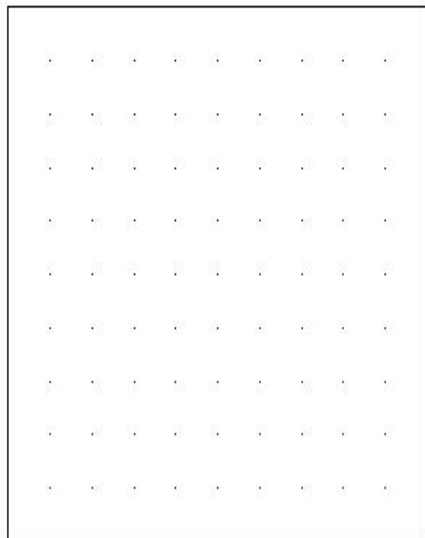
clear

light pink

orange

light green

Extension – Using 2D – Design, draw your final design in the following views:

● Front view ● Side view ● Plan view ● Oblique ● Isometric

Step 2):
Equipment: Panel pins, pillar drill.

To do: Using the pillar drill , drill through the marked area . Repeat this for all pieces of wood marked. Now you can put the panel pins through all the holes.
Make sure that the drill drills all the way through the piece of wood so the pins can easily go through.

QC:

Time needed: 10 minutes.

Step 3):
Equipment: Clamp stand, hammer .

To do: Place the short piece of wood on top of the longer piece creating a right angle . Them place in clamp stand . Using a hammer gently hammer the pieces together.

QC: Pins are straight and hammered accurately.

Time needed: 10 minutes.

Step 4):
Equipment: Zero end ruler , pencil . Panel pins. Hammer.

To do: Place the box on the MDF piece. Then measure the centre line with a ruler and a pencil, marking each corner with a cross.Gently hammer the panel pins through the MDF piece . So the MDF piece is attached to the box base.

QC: Measurements are accurate and nails are straight.

Time needed: 10 mins

Step 5):
Equipment: MDF pieces, pva glue.

To do: Squeeze a small amount of pva glue onto one of the MDF pieces. Then place it inside your box and hold for about 30 seconds . Repeat this for the other piece but stick on the opposite panel.

QC: Ensure the pieces are glued securely before proceeding.

Time needed: 5 mins.

Step 6):

Equipment: Hand drill, switch.

To do: On a different side from the MDF pieces. Place the drill roughly in the centre and drill with force. Until your drill right the way through.

QC: Drilled all the way through the wood.

Time needed: 5 mins.

Step 7):

Equipment: Sand belt, sand paper

To do: Place box upside down on the machine bed , and sand gently turning your box 360 decrease. After using sandpaper sand the top of your box .

QC: All edges are sanded down with no rough edges.

Time needed: 35 mins

Step 8):

Equipment: Dark wax, cloth

To do: With a cloth , using a little bit of wax. Buff the wax into the wood grain. Then use a different cloth to ge rid of the access wax . Do about 3-6 coats of wax onto your box achieving a darker shinier look.

QC: Ensure there is no access wax left on the box .

Time needed: 40 mins.

Step 9):

Equipment: PCV drill, goggle, circuit board, solder , solder iron, wires , LED.

To do: Drill 8 holes onto circuit board. In the centre off all circles. Then thread wires and LED lights through and solder.

QC: Holes are drilled accurately, safety goggle are worn.

Time needed: 2 mins.

Step [　]
Equipment: Wooden, box , hot glue gun. Solder, solder iron

To do: Glue finished circuit board on the base of your box and hold or 30 seconds. Next solder your switch and circuit board together.

QC: Glued securely onto base of box, circuit board works (test with batteries)

Time needed: 5 mins

Step [　]
Equipment: Computer, 2D design software

To do: On 2D design , use the computer package to design the top of your box . Then send to laser cutter to cut the design in acrylic .

QC: When designing ensure your design is colour coded black and red ready for laser cutter.

Time needed: 30 mins.

Step [　]
Equipment: Liquid solvent cement, cutted acrylic, clamp.

To do: Clamp pieces of acrylic together and glue . Leave in clamp for a few minutes. Then glue stand to top of box .

QC: Glue is securely glued and dried before proceeding.

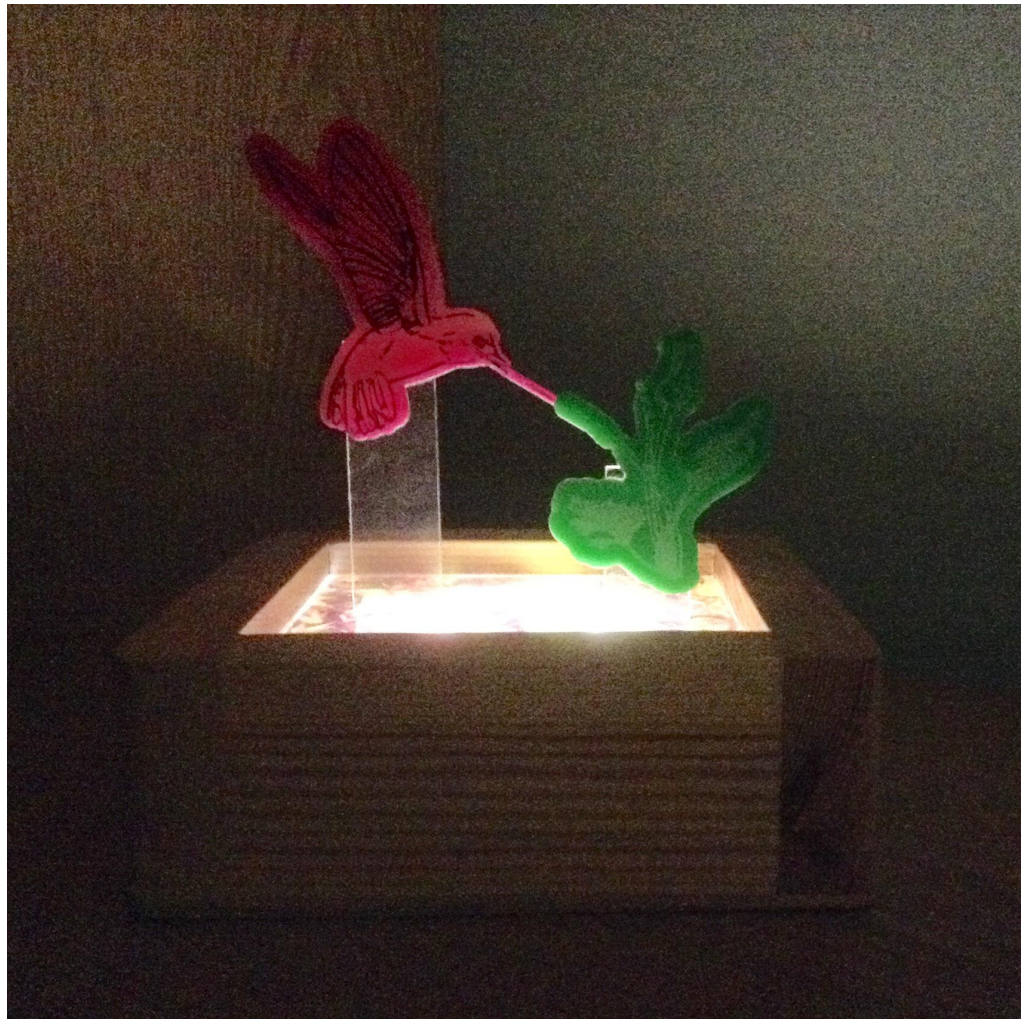**Time needed:** 10 mins.

Step [　]
Equipment: Two pieces of square acrylic. Printed square design

To do: Place paper design in between the two pieces of acrylic and place in top of box.

QC: Paper is secure between acrylic.
5 mins

Time needed:

This photo demonstrates how the circuit board works with batteries. The light gives off a soft glow.

This is what the night light will look like without batteries. In natural daylight.

1) Evaluation

2)

Try to give **full details** and write your evaluation in paragraphs so that it reads like a story, not as answers to these points.

1) Your opinions

Read your brief and specifications again, then write about the main specifications in turn explaining how well it does what you said it should.

-In my first specification I said that the design should consist a theme of nature and animals. I have met my specification in that my night light consisted a humming bird and a plant. I also didn't paint the wooden box to give a natural effect.

- In my next specification, I stated that my project should be suitable for my target user. I have ensured my night light was suitable for target user . I have ensured my design is friendly and girly suitable for young girls. I made sure my hummingbird was pink to satisfy my target user.

- In My third specification, I suggested my design must be finished to a high a standard to please my user. I met this specification by ensuring my wooden box was sanded down making sure no rough edges were visible. Also I tested my acrylic birds , so they wouldn't fall off or snap . This yet again, would make a box look better , a higher standard.

2) Testing

What tests have you made to see if your project was successful? What are the results?

- I have tested my night light in various way. For instance, I've tested my circuit board by applying batteries to the battery pack .
- Also I tested my project my checking the consistency of the acrylic birds and plants. I tested this by attempting to move the securely glued bird.
- Lastly I runned my hands over the finished wooden box to feel any splinters or rough edges.

3) What other people think

What do other people think of your project? (the ones who would use it or friends, parents etc) . What do they think are the good points and the poor ones? Could they suggest ways that might make it better?

My targeted user loved my finished project . She loved the design and the finish . She uses it every night for a purpose of giving off a soft glow. My user loved the naturalness of the finished design and the fact you can see the wood grains on the base of the box. However they suggested that to improve I could've made the wooden box darker. I could do this by waxing it in more coats or use or a darker wax.

4) How well did you work?

Were you organised, did you plan ahead and finish on time? If not, how could you have saved time? Did you do your best possible work? Were you neat and tidy? Did you need much help? Did you help others? Was you design folio work complete and neatly presented?

I think I was organised when planning my design , although I wasn't 100% sure on my design because I thought it was bland and boring . However, as soon as we started designing the box I got excited about finishing my design . I worked well and helped others when possible apart from Sevyn.

5) Conclusion

Which parts did you enjoy the most and which parts did you find difficult? What did you learn from doing this project?

FOLIO 1	PRACTICAL 1	PROGRESS 1	EFFORT 1	HOMEWORK 1	CONDUCT 1

Your strengths are:

You have worked very hard throughout this project Macy. Your design ideas are very creative and your written work is highly detailed. The evaluation produced for this project was very well written Macy, well done. During practical lessons, you have produced a high quality night-light with your nature scene on the top.

To improve:

Keep working at this level Macy, you are now performing above the level expected of you which is commendable.

Level working towards:

Due to your hard work and commitment you are now working at a level 7 Macy, well done keep up the good work.