

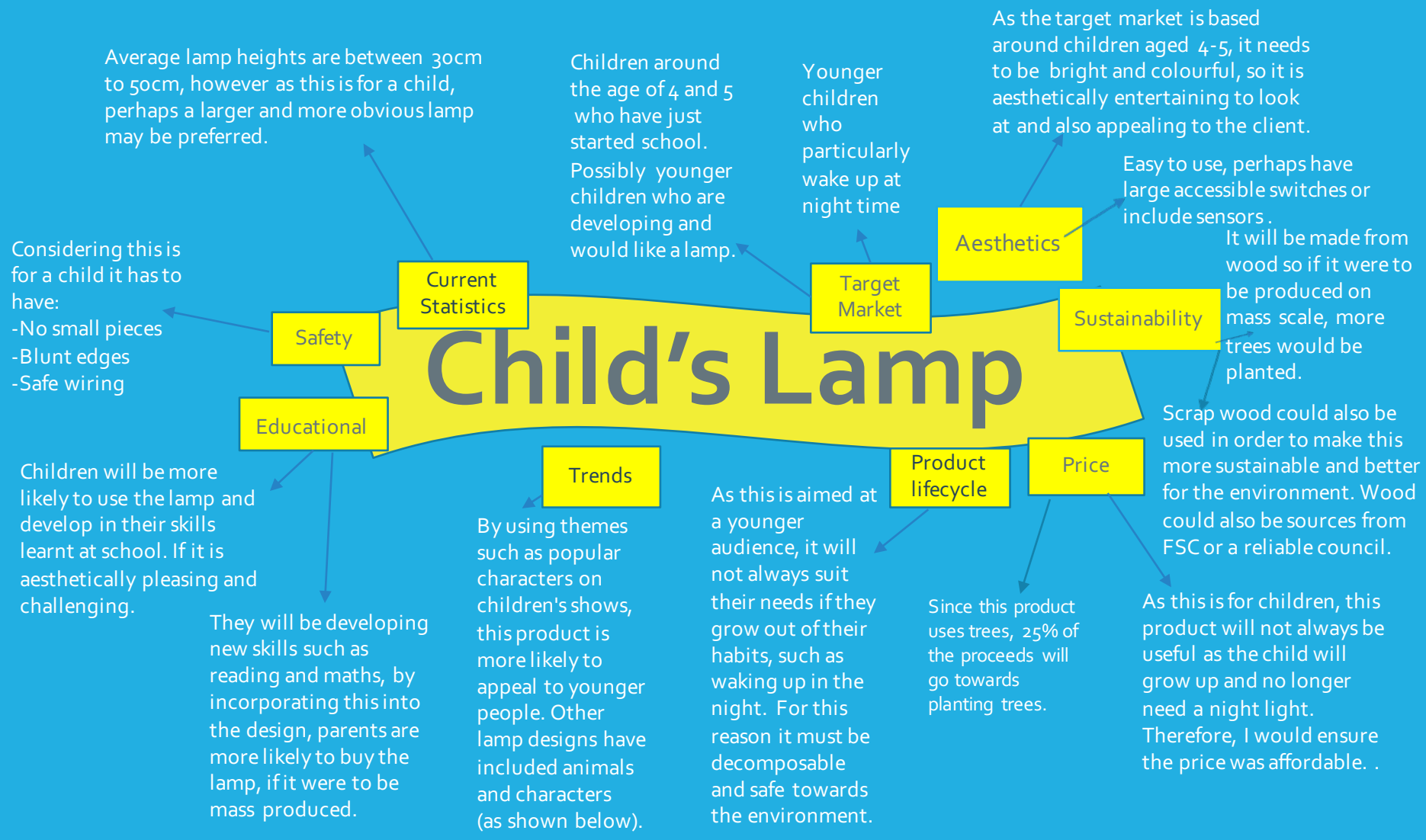
Lamp Designs

The product must

“Address the needs of infants through lighting.”

This will particularly require the application of an educational theme whilst still being aesthetically pleasing and entertaining.





Target Market

The user, a four to five year old, is developing their newly learned skills from school. A design based on counting or the alphabet, would therefore be useful and appealing to them. They are also waking up in the night so being able to reach a light is becoming a necessity.



Curved edges and a subtle light, not beneficial to development of younger children.



Uses the theme of a popular movie (Nemo) and is also easily recognisable by younger children.



Particularly attractive, especially to younger boys, who tend to be interested in Football.



Colourful and particularly interesting to watch, maybe more suited to younger girls, due to the colours.

Product Analysis

Environment

This product is made from plastic so is not recyclable. For this reason it isn't good for the environment. It is however long lasting and not just beneficial to young children.

Aesthetics

This design is both aesthetically pleasing, due to the colours used and the interactive aspects, such as the rotating sphere and the educational map.

Materials and Manufacture

Sturdy stand and use of high quality plastics moulded through, vacuum forming, to ensure it is durable. It also includes an LED switch, not wires, so it is portable.



Sturdy lamp base
Ensures the lamp will not fall over easily and also supports the globe.



Hand laminated to ensure it is sturdy and hard wearing.



Function

This will be used as a night lamp specifically so that the client can use it when they wake up at night, meaning the switch has to be big enough to feel in the dark and it is safe enough that if it were to be knocked over, it wouldn't be damaged or hurt anyone, hence the use of plastic being used.

It can also be used for Education and reference making it multifunctional.



Safety

This product doesn't contain any small parts or exposure to lights. The fact it is made from plastic could mean that it may overheat, depending on how thick it is. This product is battery powered to minimise the chances of electrical hazards.

Coincides with modern British and European safety standards.

Customer

This design is gender neutral and appropriate for all ages above 4, as it includes words. This product also focuses on key development skills nurturing a child's: science, technology, engineering, arts, geographic and mathematics skills ultimately enhancing a child's critical thinking.

Size

25 cm diameter
It is a large enough lamp for the details to be readable. It is also well built and due to its large base of 15cm, it is harder to knock over, making it suitable for all ages. Large switch makes it easy to use, especially helping with younger children and their development.

Cost

This lamp includes plastic which has been shaped by a former and then dyed a variety of colours to create an appealing colourful globe. It also includes a stand, which enables the globe to rotate, and the electrics.

This approximately adds up to around £10, including packaging.

For this reason, this lamp is priced at £15, allowing the creators to make a £5 profit.

This makes it accessible to all social demographics.

Client Interests

Emily has started waking up in the night so needs a light that easily turns on and will help her fall back to sleep.

This could be useful in educating Emily about what is around her, for example by creating an LED light, she will learn about the world and different countries or by creating a letter shape, she will become more familiar with what she has started learning at school.

Emily's parents don't want to pay anything over £15 for this lamp because they believe she will grow out of waking up in the night and also believe she will find the lamp less appealing as she grows older.

Preferably a dim light so that it is not too harsh if she wakes up.

As this is to be used in the dark, there needs to be a large accessible switch so Emily can easily turn it on and it has to be light weight, have a large case and be made from a strong material in case it falls in the night.



Emily would most likely prefer this lamp if it had an interactive appeal to it, such as a magnetic puzzle or a button that plays a song so she can feel more relaxed about waking up in the dark.

Particularly likes bright colour, new textures and interesting shapes, which may be challenging considering the safety with no sharp edges or anything harmful like splinters.

Lamp must be an affordable price, about £10, since it is only needed until Emily grows out of the habit.

The most important selling factors to Emily's parents are that: this product has no sharp edges, is light weight, appeals aesthetically to Emily and is affordable.

The materials used to create this lamp need to be hard wearing, safe and light (under 3kg) so that Emily can move it.

Client: 4-7 year old

Occupation: Student

Social Demographic: Young Girl

Interests: Puzzles, Music, Dancing

Nature: Curious

Pre Existing designs approved by the client:



Ballet shoe lamp



Rainbow musical light



Unicorn Musical Night Light

Page Summary:

Emily would like a lamp that appeals to her interests and fits her room and its theme.

Additional Research



This may appeal to Emily's curious nature as she can understand how things are constructed, as this design evidentially shows the building blocks to a final product. Priced at £7 and so is well within the client's budget.



Puzzle grooves could be incorporated to make it more interactive.

Lamp by itself is priced at £19 and the puzzle costs £5.



This lamp is priced at \$99.99 and specifically designed for younger children.



Perhaps this could be modified to have a larger keyboard so it is less likely to fall over.



Priced at £25, needs to be minimised in order to suit the clients requirements.

The first lamp is made from acrylic and priced at \$16.68 and can change colour, it is also more of a universal design appealing to younger and older people.



Suitable Materials...

Polypropylene (PP)

A flexible and versatile material, which is strong and durable.

Acrylic

Good for transmitting light as it can be thick or thin. Is strong and easy to use in forming or to cut.

PLA

A biodegradable plastic particularly strong and durable.

Wood

Long lasting and easy to use. Maintains its shape, the weight can vary depending on the types.

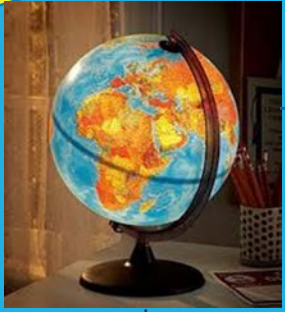
Silk Paints

Silk allows light to travel through it and can be sculpted to create shapes and decorated with patterns.

Page Summary:

A hard wearing design that is both interactive and related to her interests would be appropriate for Emily's.

Children's Lamps



Enhances someone's understanding of the world and develops geographical skills.

Affordable, at £10 and hard wearing, especially suited to younger children's needs.

This globe has been made from acrylic plastic and could still be useful and re used by older children, depending on what their interests are, meaning that it is sustainable.

Could potentially be on a timer to help younger children get into healthy routines, for example, red could mean bed time, orange, get dressed and green, time to go!

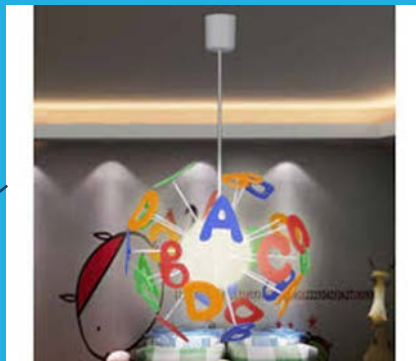
Made from plastic and being battery operated, this product is light, portable and less likely to be harmful to a user, making it suitable for younger people. It is being sold at £12.95



Aesthetically pleasing to younger children due to the familiarity and glowing colours used, perhaps making it a useful night light.

The round circles could also serve as push switches, especially useful to younger and less coordinated people.

Plastic has been used to create this lamp which has most likely been designed for a toddler or somebody who has only just started school. This makes the product less diverse compared to the Traffic Light and Globe.



The bright colours particularly make this suitable for younger children, however this light should also arguably include a shade because staring at a bright light can be very harmful.

For this reason, it is debatably also overpriced at £39.21

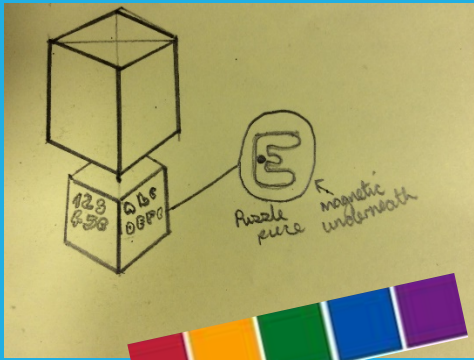


At the moment it is not educational and can be dangerous if it overheats. For these reasons, it may not be appropriate for young children or even be bought by their parents, especially as they can range from £10 to £100.

Particularly younger girls may find this Lava Lamp both appealing, relaxing to watch and entertaining, especially due to the vibrant colour scheme and movement.

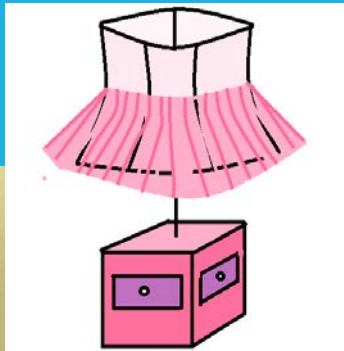
Lamp Ideas

Features interactive alphabet puzzle to encourage young children to learn.



Tie Dyed silk painting to serve as the lamp shade.

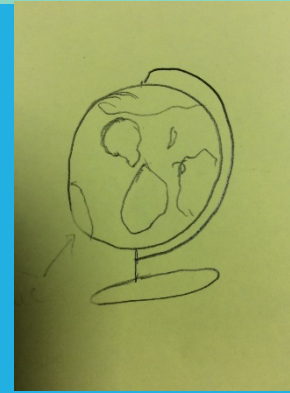
Bright colour scheme to aesthetically appeal to younger children.



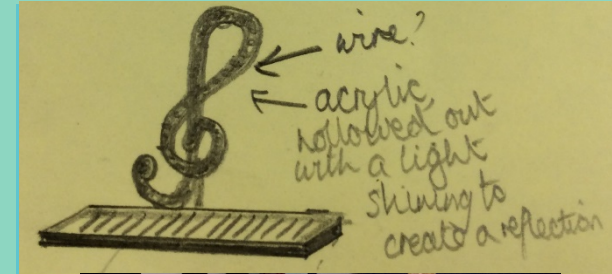
Suits Emily's love of dance.

Drawer so Emily can keep trinkets

Possible magnetic attachment to ensure the pieces will be secure.



Motorised spinning globe to relax and calm the client. Uses a dim light and could include music.

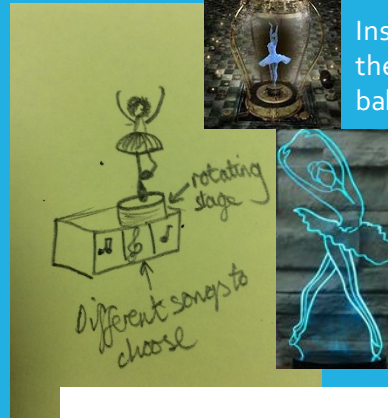


This is delicate and can be easily break, not making it ideal for a younger child.

Adaptable concept appropriate for all themes and easily recognisable as a design



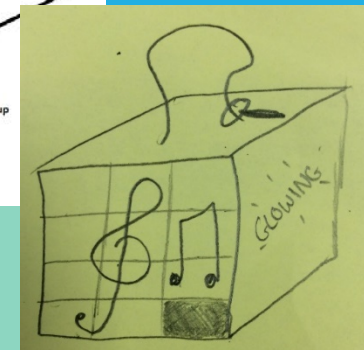
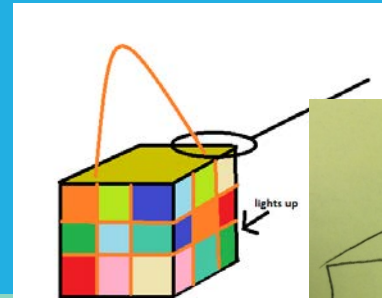
Inspired by the spinning ballerina box.



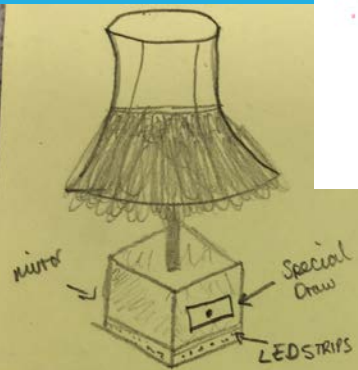
The ballerina could provide the light source for the lamp and be on a spinning motor



Glowing and colourful. Including an interactive game which interests the client hand her curious nature.



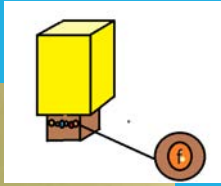
Appealing to Emily's style fitting with the rest of her room.



Refining Designs

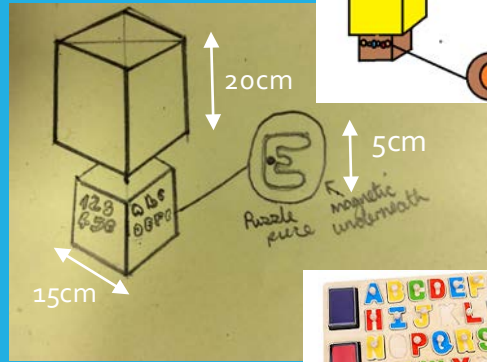
Bright, eye catching design to attract her attention and brighten up her room, particularly appropriate as she likes bright colours.

Wood can be sanded to ensure a safe finish and magnets could be attached to the puzzle pieces to prevent them from falling.

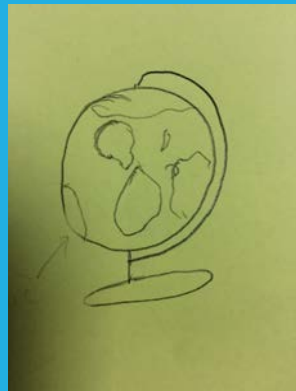


Emily will not want to use this when she is older due to the alphabet puzzle aimed at younger children, providing an environmental issue.

Educational however not so interactive. Can be used as a reference for geography, perhaps more suitable for older children.



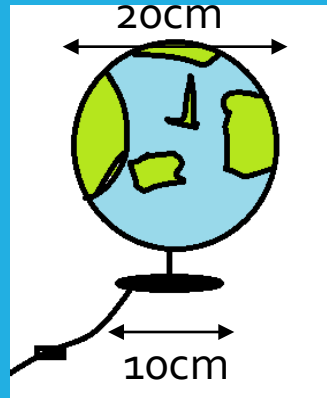
Base made out of wood, sturdy and strong, however it could give splinters.



As this product uses only plastics, it is arguably bad for the environment. It is however appropriate for all audiences so could have a long lifespan and usage.

Easy access to switch to turn product on, light weight and easy to transport.

There are no small parts used in this product, which is a huge selling point to parents with young children. It is also sturdy and strong due to its vacuum formed plastic qualities.



Mainly uses plastics, which are long lasting and light weighty, however could be problematic in the long term due to its product lifecycle.

Plastic is fairly expensive and as is the process of paying for a children's lamp. Used for moulding it, for this reason, products such as this one already cost over £15, which is more than many people are willing to pay.

Eye catching aesthetics, specifically designed to correspond with Emily's love of bright colours. The shape is also more abstract and appeals to Emily's love of interesting shapes.

Considering the range of ages and uses for this item, all edges must be sanded and there can be no small parts so no danger is put on the customer.

This also doubles as a puzzle, appropriate considering Emily's current interest, proving to also be multifunctioning and economically beneficial.



The light would shine through the acrylic to create a multitude of dim colours, creating an almost rainbow effect, similar to the rainbow light that Emily approved of.

Acrylic would be used to create this effect. This could cause some Environmental Issues, due to the fact that it is made from a non-compostable material, especially considering how Emily will grow out of the product.

Interactive, to enable Emily to learn and develop kinetic skills.

Easy to use, as is a regular and popular design. Could possibly prove challenging in the night time when it is dark.

Created using biodegradable products which are good for the environment and do not have long lasting repercussions.

Fabric and wire top, could be too delicate for a young child, especially as it is within reach.

Further analysis of materials...

Beech is very easy to work with and unlike lots of other woods it isn't poisonous, making it ideal for children.

Beech - A straight-grained hardwood with a fine texture.

Very hard so is ideal to be used in this product since it might be bashed around and used often.



Can be steam bent, possibly useful in preventing sharp edges.

Naturally light in colour making it easier to paint than darker woods.

Uses include: furniture, toys, tool handles.

Could be used in forming the puzzle pieces as it still enables light to shine through and is strong and sturdy.

The problem remains that the puzzle pieces need a way of staying on the lamp when put there.



Having magnets and grooves where the puzzle pieces can be inserted could allow puzzle pieces to stay in place.



This may prevent the light from shining through as well as it should.

Client Feedback



Emily particularly liked the idea of a rainbow light. By incorporating this into my design, it will be more suited to Emily's interests whilst serving its purpose.

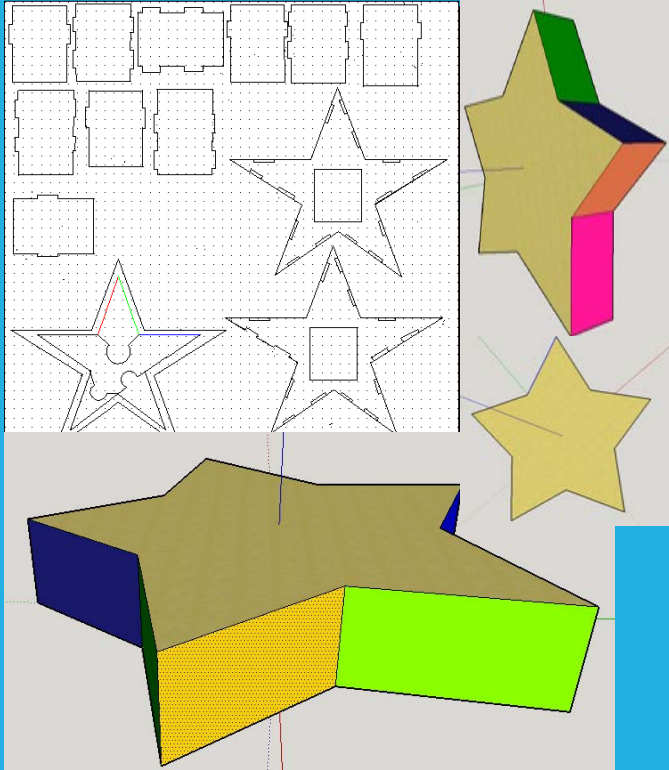
This rainbow effect could be achieved through tinting the puzzle pieces rainbow colours: Red, Orange, Yellow, Green, Blue.



Alternatively rainbow puzzle could be included instead of light.

Developing CAD

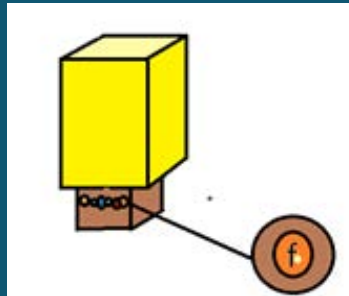
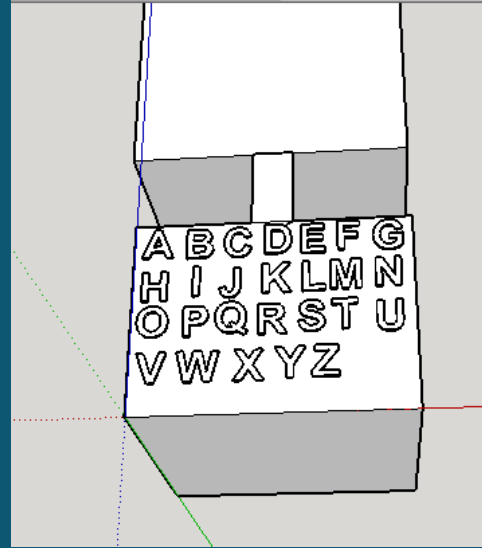
This will also be a puzzle, so is multifunctional. Through seeing it as a 3D design, having a regular lightbulb doesn't seem possible.



By using acrylic panels at the sides of the star, light can still shine from the sides of the stars, and the puzzle can be solved without the plastic heating.

The alphabet would be in puzzle form to encourage the kinetic development of the client.

This focuses on the educational aspect on child development, using the alphabet.



This could be fiddly and too small for a young child, as the pieces are arguably too small to be safe.



This could be created using a vacuum former and a mould to get the spherical shape.

The base structure could, however, be harmful as it would have to be heavy enough to support the Globe on top of it.

A bulb could fit within the circular dome, however the question is whether it could be changed if necessary.

Client Feedback



"I like the star because its an interesting shape and it will make rainbow colours."

Summary:

The star poses the most safe and technically achievable design and is most approved by the client.

Developing Modelling

Client Feedback



"The size is good, and I like the shape but it looks a bit boring."

How to Improve:

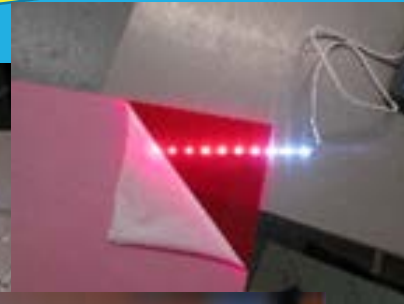
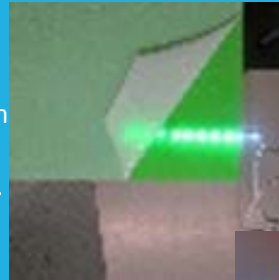
-Add more colour

-Appeal to either an educational aspect of Emily's interests or be based more around dancing.

-Consider whether the puzzle pieces will stay in place when the star is standing.



Testing the brightness of LED lights when they shine through acrylic.



The light will be positioned further away so it will not be concentrated in one specific area.



Reviews suggest that the acrylic would create a better effect if it was frosted so the light isn't as harsh and blinding and you can't see the inner section of the lamp.



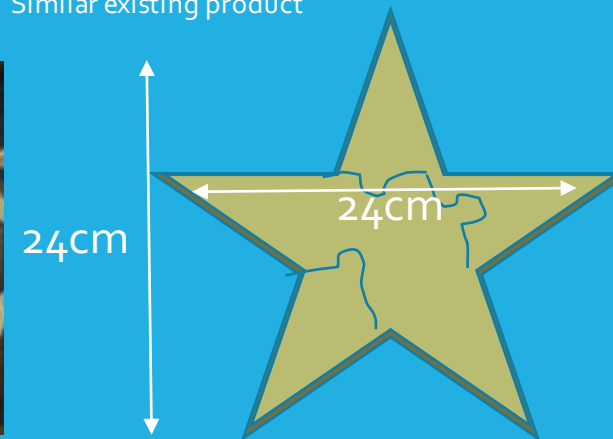
Similar existing product

No frosted acrylic is available at school. Darker colours could be used to make it harder to see through the product, however the light may not shine through as well.

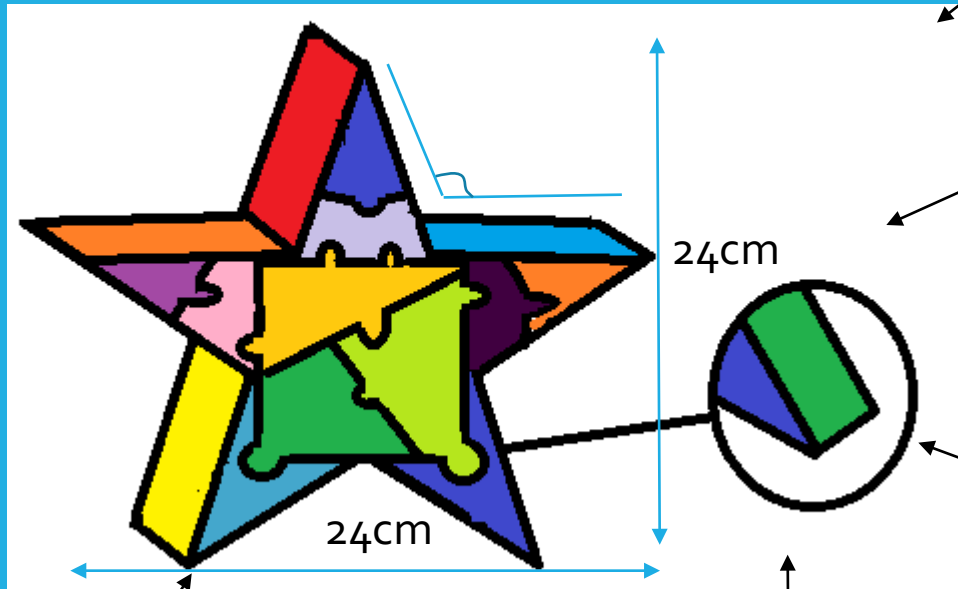
I used the CAD/CAM design to laser cut the star in cardboard to ensure that I would not be wasting wood or acrylic. It's also cheap and easy. Then I slightly modified my files before printing them once more to create a successfully fitting project.



Basic structure of design



Final Design P1



Puzzle can be created out of recycled wood, using a lathe.

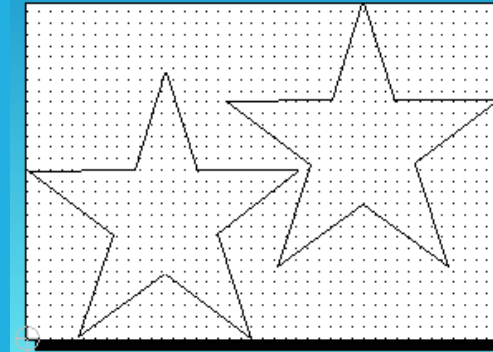
The sides could be created using thin sheets of acrylic which will allow the light to shine through creating a rainbow affect.

The sides can be sanded down so it is less likely to cause harm to the young child. The sides could also be rounded to create a smoother side.

Strip magnets can be used to secure the magnets and make sure that they are connected strong.



The star shape puzzle can be cut out using a laser cutter to ensure accuracy and be secured using magnets to another star board.

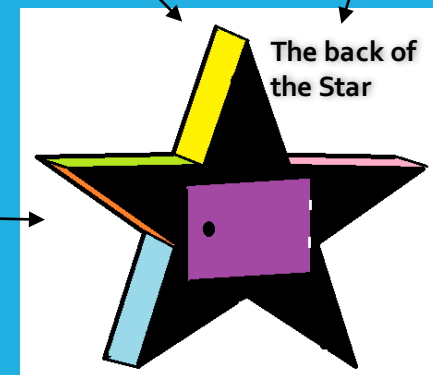


Diameter of the bulb is 6.4cm and needs a height 22cm so the bulb will fit.

The door will open at the back, this will enable the bulb to be changed.

Could include a hanger so that it can be hung up on a wall or taken down.

Plywood door, on small hinges, for easy access to bulb. Considering this is for a young child, a safety catch may be needed so they aren't harmed.



- Things to consider:
- How will the light turn on?
A light switch will be added to the back of the star.
 - How will it be child friendly?
The stars sides will be sanded down to ensure it will not be as easy to damage.
 - Will it stand up?
As this is interactive, it needs to be accessible. For this reason it must stand.
 - How will it appeal to moral, economic and social issues?
It will be made using recyclable products and as little waste as possible.

Client Feedback



"The puzzle looks a bit hard because it isn't a pattern."

How to improve:

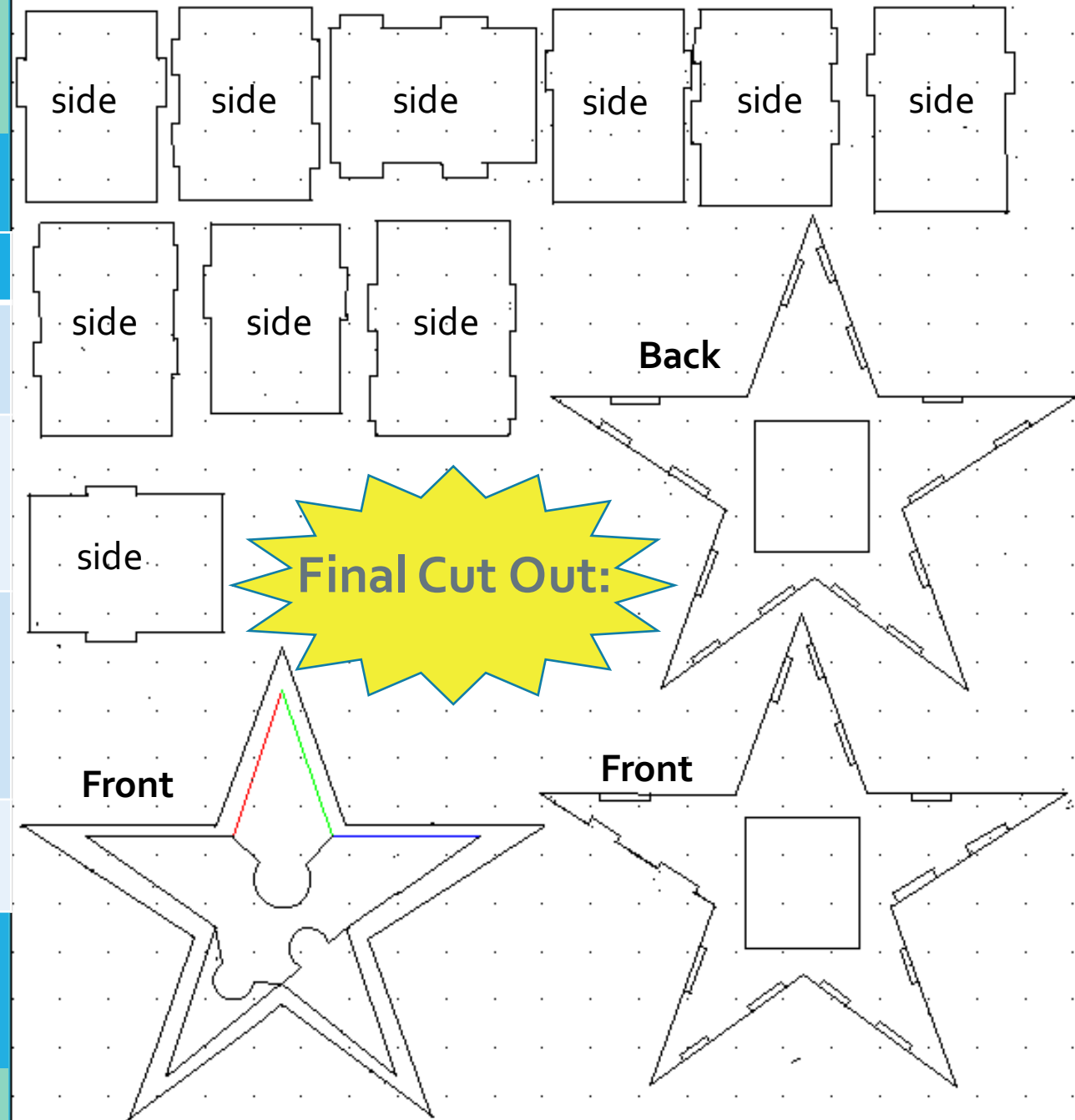
Simplify the puzzle.

Remember: The design needs to be safe for young children so can not have sharp edges.

Final Design P2

Design linked to Design specifications

Moral Issues	This is a useful product, as it will provide a comfort for the client if they wake up in the night but uses a lot of electricity. Other than this, it is safe for all to use as it will be well sanded and will have no small parts.
Environmental Issues	Acrylic is a part of the design and enables the puzzle to also serve as a lamp. It is being used with the consideration that it is non biodegradable, which has been incorporated into my compact CAD/CAM design. No strong reliable alternative was affordable, especially considering my client's age and position.
Sustainability Issues	I have tried to reduce the amount of materials used in my design by considering how I lay my design out on the CAD/CAM software. Elements of wood have been recycled in the process of making this product, such as the puzzle pieces. This is beneficial to the environment also since it is multifunctional and serves two purposes as opposed to one, meaning its lifecycle should also last longer.
Social Issues	This has no foreseeable social issues other than the fact it will enable my client to go back to sleep instead of disturbing the household, perhaps improving her and her family's productivity during the day time.



Manufacturing Process

1. Cut out design using laser cutter.

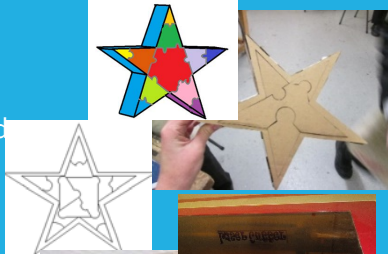
Modifications:

Position pieces so they are further away, this way they are less likely to catch fire. Adjust sides slightly so that the depth of the acrylic – 3mm is flush with the rest of the design.



2. Recreate puzzle pieces

Original puzzle pieces proved too complicated and challenging when tested on various subjects.



3. Cut out in ply

Using the laser cutter, the front pieces are being cut on laser ply and the sides on acrylic.



4. Laser cut acrylic

Laser cut differently colours of acrylic



5. Modifications

Not all of the acrylic pieces fitted so the wood needed to be adjusted slightly. To do this I used a chisel in conjunction with a mallet to create enough space. I will later use filler to fill in the gaps.



6. Match the sides

Slot the acrylic into the sides and glue it using UHU glue to hold it in place.



7. Glue sides up and file

Using acrylic glue to glue the sides together and UHU to glue the acrylic to the wood I assembled the pieces. I used masking tape to secure it whilst it was drying.



8. Filing

The sides needed filing top that the wooden top would fit. There was a gap of around 2mm so this proved difficult.



9. Soldering

I had to solder the light bulb to the wires using a soldering iron and solder.



10. Positioning the Bulb

I used a glue gun to secure the super bright LED in place.



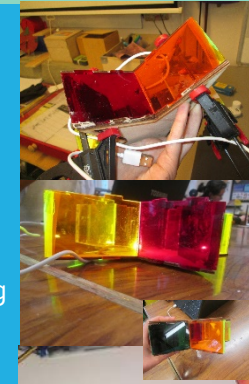
11. Cut Hole

A small hole needed cutting in order to fit the USB plug. To do this, I used a pillar drill and sanded it to fit the width of the port.



12. Put the top on

Using UHU glue, I secured the top and used clamps to hold it in place.



13. Testing

I tested the product by using the light and playing with the puzzle.



14. Finish

In order to make the puzzle easier to solve, I painted a design on top, so people didn't force puzzle pieces into the frame.

In order to paint this, I used poster paint and then later used varnish on top to form a protective layer.

There were also some gaps in the wood from where extra bits had needed chiselling. I made my own filler using saw dust and glue so the filler blended into the wood.



SAFETY
When using electrical equipment, including The pillar drill and scroll saw, I ensured that I was wearing goggles, an apron, knew where emergency stop switches were and that nobody around me would come into harm.

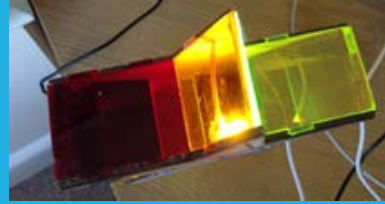
Summary:

I achieved my design through using a laser cutter to cut out my required shapes and then refining them with hand tools.

Final Product



Front view



Sky view



Nearly complete puzzle



Side view



Side view



Frame without puzzle

Client Feedback



How does this appeal to the clients interests?

- Interactive
- Colourful
- Light weight
- Interesting shape
- Strong
- Inexpensive to make

" I really like how the light is different colours especially in the dark!"

Emily

Evaluation

If I were to recreate this product, I would consider the use of an alternate material to acrylic, especially as acrylic is not good for the environment. Perhaps fabric could have been used instead, or some recycled plastic, to make this a more sustainable product. As well as this, I would try to incorporate a large switch into my design so that it is easier to operate and does not need to be on all night.

The colour scheme could also have been slightly adapted to precisely recreate a rainbow, as my client specifically liked the idea of having a multitude of colours around her room, "like a rainbow" and I would have also preferred to find either frosted acrylic or a fabric that concealed the interior of the lamp so the light did not prove to be dangerous.

Despite, continuous testing, the parts also did not all fit exactly and needed to be altered. If this were to be mass produced I would confirm these measurements once again.

General opinions on product:

"The aesthetics are appealing however it looks delicate." Timothy Brady

"Very good, I would definitely buy!" Olivia Wakley

"I think it is under priced for what it is" Bryony Rhodes

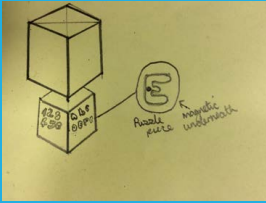
"I would have considered a different shape to a star, since it is designed for children and is likely to be knocked." Jim Brown

Evaluation of Design Ideas

	Design Specification:	How this has been met:
Aesthetics	Must be bright and appealing to the client, so include something related to her interests like a simple puzzle.	The client has an interactive puzzle with bright acrylic panelling and an eye catching design to enable her to easily complete the puzzle.
Cost	Be suitably priced, around £10- £15, so that Emily's parents will buy her this lamp.	As this was all compactly designed on CAD/CAM software, no excess in materials has been required to make the product. Extensive testing was also carried out to ensure the measurements were all in place and correct, ensuring no expensive materials would go to waste.
Client	Be aesthetically pleasing to my client yet still be light weight (3kg at most) and under £10.	Contact has been kept with the client throughout the designing and making process to ensure that the product suited their requirements. As a result of this the total cost is less than £10
Environment	Comply with FSC guide lines. Give back to the environment.	All wood used has been sourced using a contact and the acrylic has been used precisely so nothing has gone to waste. The product is long lasting and well built so is compliant with the environment.
Safety	No small parts, lamp shade, no exposure to light bulb, ideally cordless.	I wasn't able to make this cordless, however I minimised the use of small parts and their exposure (like the bulb cell) by ensuring it wouldn't come out, through sealing the star.
Ergonomics	Large switches and general design so that less coordinated younger children can still use them.	I wasn't able to use a switch in the end, due to my bulb choice. I have instead, a USB attachment which can easily be plugged in or out of a socket.
Function	An obvious light source with large obvious switches for when the child wakes up in the night.	Instead of using switches, I have one bulb cell which created a dim light, enabling this to be used more as a night light as opposed to a bedside light, perfect for a child who keeps waking up in the night.
Materials	These have to be light weight, so ply wood (3mm) or thin sheets of acrylic, need to be used.	The product is lightweight, weighing 220g. Despite the weight the product remains strong with its finger joint structure and the reinforcement of both UHU glue and Tensol 12 (acrylic glue).
Manufacture	Meet modern safety standards and not have any small parts.	Modern safety standards were met and no parts smaller than 3cm have been used. No parts smaller than 7cm are accessible from the exterior.
Sustainability	Be hard wearing, appealing design.	I have used long lasting, sturdy and strong materials in conjunction with strong joints to ensure this product is sustainable.

Modifications

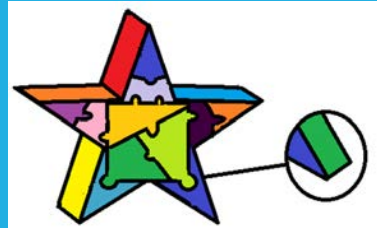
Client Feedback



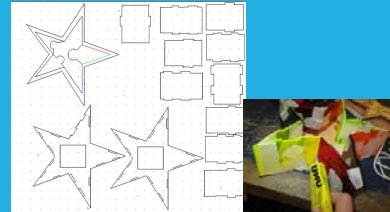
Initial design consisted of a lamp with puzzle pieces at the base.



I later concluded that using a lamp shade would not be ideal for younger children as they are easily breakable and harder to clean.



My next idea was to create a light using only acrylic, however this would have resulted in a sharp, dangerous and possibly heavier product..



From here I adapted my design so that there would only be acrylic around the outside of the star and the puzzle would be made out of wood.

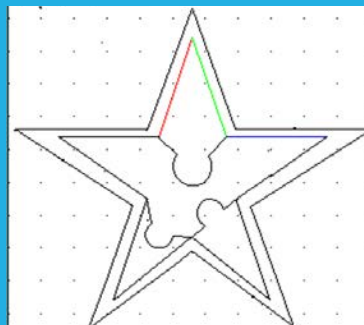


The back panel in my design, also proved unnecessary because I decided to use a cell instead of a bulb.

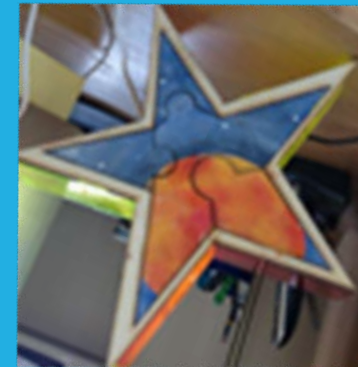


When testing this product with my client, she found it hard to complete the puzzle as it wasn't clear where they were supposed to be.

I decided to paint a design onto the puzzle to make it easier to solve.



Final Design



Final Product

"I love my new lamp, it fits in with my bright room and it is very helpful. It stays on all night and I get a good sleep now."

"The product is both safe and fun, we are confident that it is worth it and that it fulfils Emily's curious nature" Emily's Parents

Summary:
By adapting my designs, they have become more suitable for my client and serve their purpose better than the original design.