

Controlled Assessment Task

Natural Influences

Task 14



Situation & Brief

Situation

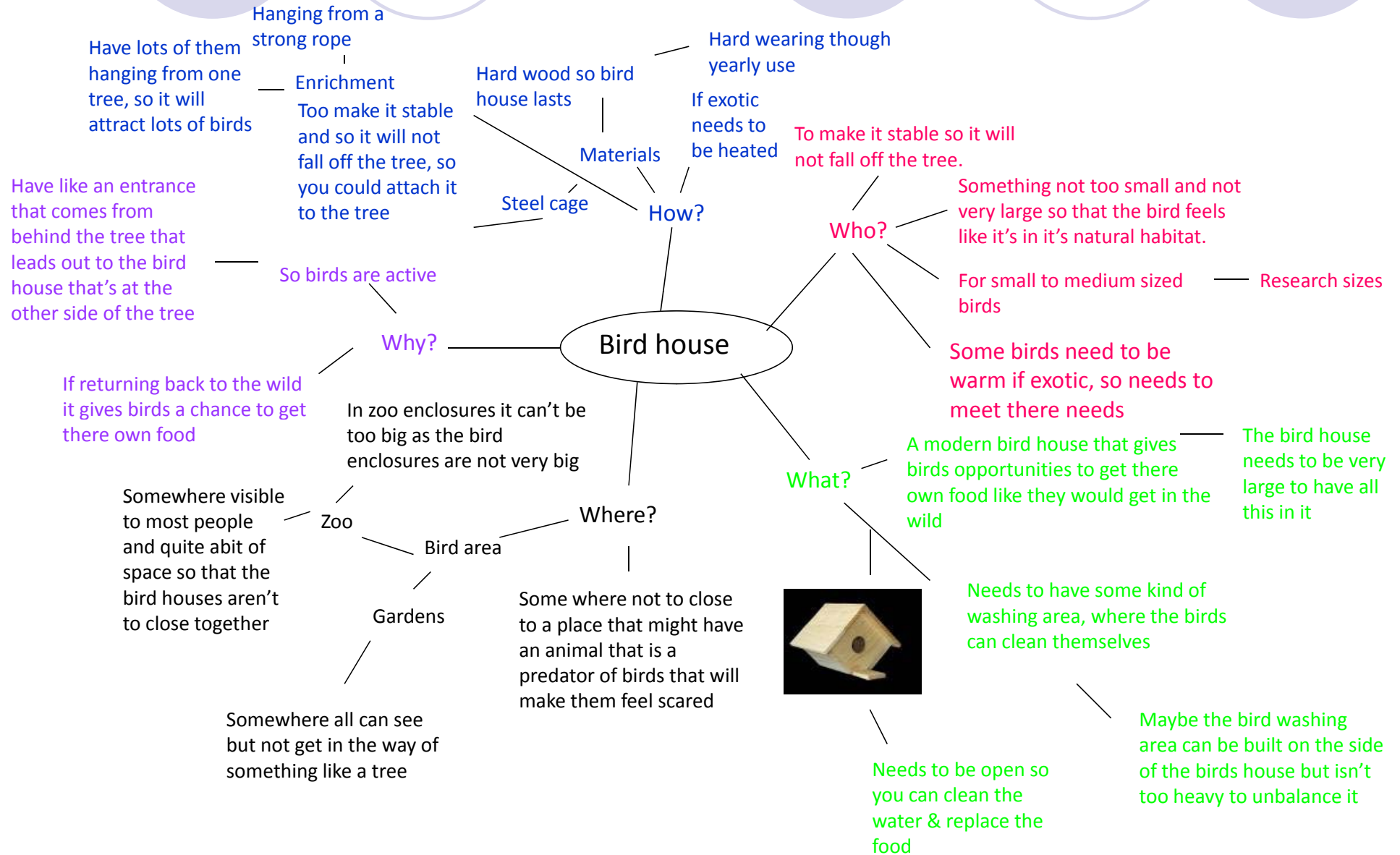
Bristol Zoo has identified from the Marketing Department, that zoo visitors have been disappointed with the lack of indigenous species currently inhabiting Bristol Zoo Gardens, and therefore have been having trouble attracting visitors to visit the 'Bird Gardens'. You have been asked to create a new bird house to help encourage indigenous species to nest and also incorporate the idea of developing a sustainable breeding programme. In addition they have identified an opportunity for visitors to sponsor a bird box to increase interest and encourage more people to visit Bristol Zoo Gardens to monitor their sponsored bird box.

Brief

To achieve this I will create a number of sketches of the design of the bird box. It must include the idea of originality, I could incorporate this by using authentic designs that will be attractive to birds and encourage breeding. This would also be good practise for introducing birds back into their natural habitats. I could attract visitors by making the enclosure out of clear acrylic, the point of this being that you will be able to see what the birds are doing inside their homes, kind of like a 'bird big brother'. If mass producing the materials and cost of manufacturing must not be too expensive, but as this will be a one off product the cost is not so important.



Mind Map



Mood board



As you can see in these images there are a lot of different designs ranging from an small enclosure to a massive tower. I can use some of these ideas to incorporate into my product. These images show all different ideas of what a bird house can look like. However none of these images look like my idea of what my bird house will or should look like.

Existing products



This bird house has got a barn theme to it that looks effective because it stands out. The positive aspect about having a barn as a theme is that the colours will look good new or worn due to most barns actually looking worn down. I think that I would RRP £22.99, due to the materials costing very little and paint. This bird house is good for the environment due to little wood being used and other materials. This bird house is safe because it is on a tray giving it some protection and hopefully stopping it from shattering is dropped. The bird house looks small so only able to fit the region of 3-4 birds in it, but this could easily be extended by adding an extension on it in further development of the product. This bird house works by the bars entering the top of the "tower" then being introduced to a one room where presumably the food is also kept. This house is made out of wood and some kind of stone-like material that gives it the effect of rock.



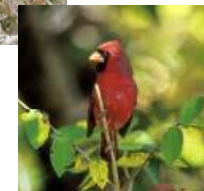
It looks like a basic bird house but looks effective because of how easy it is to understand. I think this would RRP at £12.99 due to the materials costing very little and as it is a simple shape labour is likely to be cheap as well. This bird house looks as if it is good for the environment because most of the materials are sustainable. This bird house doesn't look 'sturdy' because it is only hanging from a tree by a thin chain. This can only be used by small birds because the hole for entering is very small. The materials are good because they give the bird house a classic feel and are attractive to birds because it looks like a tree trunk due to the colours. Also there is a thin pole fixed into the front of the bird house for birds to sit on.



This bird house looks like a family home and looks effective because it will make people look at it because of the bright and vibrant colours, the only downside to this is that when the colours fade it won't look as effective. I would price this at £25.99 because a lot of craftsman-ship has gone into this bird house because of the detail of the colours. This is in some way good for the environment because it is made of wood, but when it rains the colour from the bird house may peel off and making the wood rot. This bird house is safe because it is on a stand and tray that supports the whole bird house. It is an average size enough to fit half a dozen birds in you could extend this product further easily by adding another floor to the 'house'. It works by birds entering the small hole on the top left on the roof. This bird house is made out of wood and it could have rubber on the end of the stand for more grip.



This bird feeder is very unique because while doing my research I not found any product quite like the same. I think that would appeal to most customers because its not big and not hard to find a place to install it. I would price this at £13.99 because it is a small product but however a lot of detail will be needed to create the product. This could become very good for the environment if you used an old apple and actually made the shape out of the fruit instead of plastic or another relative material, however if you used a long lasting material the product would last longer. This product it relatively safe but could be safer if the product was hung on a larger and thicker chain with less chance of napping. The size of this product is small so only, small birds will be able to use this bird feeder. The product works by the owner putting food at the bottom of the feeder and birds will fly on the 'apple' and will eat the food on it. Can be made out of fruit or can be made of a long lasting and easy to make the shape out of.



Materials

Research

Building an attractive, sturdy and weather-proof birdhouse is very easy to build. Wood is a particularly good building material because it breathes, is durable and has good insulating qualities. The ideal choices are naturally decay-resistant wood such as cedar, redwood or a good grade of exterior plywood. It doesn't really matter whether the wood is slab, rough-cut or finished as long as the inside has not been treated with stains or preservatives. Fumes from chemicals are likewise harmful to the birds.

Cypress and cedar wood would require no painting but pine and plywood houses will last longer when coated with water-based exterior latex paint. Purple Martin houses are usually white while tan, grey or dull-green works best for the other cavity nesting species. These colours will reflect heat and are less conspicuous to predators.

Never use lead-based paints if there is a need to paint or varnish to preserve the wood. It is possible that birds may peck at the painted wood and ingest the toxic paint in the process. One good option is the use of natural oil on the outside of the house such as linseed oil that is food safe and not petroleum-based for maximum safety. The inside of the house is best left as natural wood only.

Brightly painted birdhouses are fun to see but draw unwanted attention to themselves. It helps to keep the backyard bird families safe when the birdhouse blends into its surroundings. Bird enthusiasts can compensate through the use of garden ornaments, stepping stones or flowers.

Gluing all the joints before nailing them will extend the life of the birdhouses regardless of the kind of wood used. Brass shank nails, hinges and screws are more rust resistant and are able to hold boxes together more tightly as they age. Hinges and fasteners can both be functional and decorative but extreme care should be taken so that there will be no sharp edges that can harm the birds.

Birdhouses should never be made of metal since the hot summer sun heats metal to very high temperatures that can kill nesting birds. Reflective metal also attracts predators.

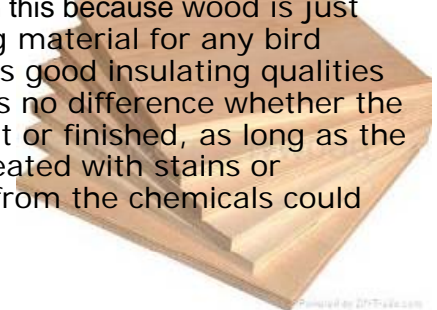


Acrylic-

I will be using clear acrylic for my sun visor on my bird house, this will act as some what of a shelter, my initial idea was to use this as a main material, however after researching I found out that birds are very private and will not be able to nest in such conditions.

Wood (Plywood) -

I am using Plywood for my main housing and roof of my bird house, I have chosen this because wood is just about the best building material for any bird house. It's durable, has good insulating qualities and breathes. It makes no difference whether the wood is slab, rough-cut or finished, as long as the inside has not been treated with stains or preservatives. Fumes from the chemicals could harm the birds.



Research Analysis

Links:

- www.whatbird.com
- www.google.co.uk/images (bird houses)
- www.bristolzoo.org.uk
- <http://www.rspb.org.uk/>
- <http://en.wikipedia.org/wiki/Bird>
- <http://www.garden-birds.co.uk/>
- <http://www.bbc.co.uk/nature/class/Bird>
- <http://cagesbydesign.com/>
- <http://www.naturalbird.com/faq/>



By conducting the research on my research table I have found out the following:

An average small bird size is 5-9 inches so my product should be able to fit **all** small birds. Therefore the front opening (where the birds fly into) must be 5-9 inches.

To find out what type of birds can be kept in my bird house I simply went onto www.google.com and typed in bird sizes find a website called www.whatbird.com, this website lists every 'small' bird there is.

After having a discussion with the school tech supporter, I have been told there is a large number of materials that I can use and he had recommended clear acrylic, this was because of a few points:

- It's very easy to clean, also you can see the stains on it.
- Easy to mould into shape, so would be suitable for my design

There is a small room where all the projects are being kept, this room is totally suitable to store my product while I am working on it.

I was recommended for the enclosure to be no bigger than *1 meter* this is due to storage issues, but this size would be too large anyway, I am aiming for my product to be no more than 80 cm by 60 cm.

Design Specification

POINT	JUSTIFICATION	TEST
Be able to fit a 'small bird'.	In my survey showed that more people would like a small bird house, this could be due to only small birds being common.	I have researched and found out that my bird house size will be large enough to house a single bird, this being 60mm to 80mm.
To have simple and accessible feeding facilities.	This is so no external feeding unit needs to be attached, this saving space and money.	Make sure that no extra external feeding unit needs to be attached.
To have no bright colours on the bird house.	This is because during my research I found out that bright colors attract unwanted predators, this making the bird house unsafe.	By only using dark or neutral colors such as black, green, brown and blues.
Be able to provide nesting facilities to enable breeding.	This is because bird will only chose to stay in this house, if able to breed successfully.	For box to be used for more than one season and be successful in aiding breeding.
Cost no more than £20.	Will need to cover build costs and make a profit.	Make sure that the amount of materials used to make a bird house does not exceed the price limit in cost.
Be environmentally friendly, e.g. could come from a sustainable resource/ be fully recyclable/ biodegradable, etc.	Bristol zoo is an organisation that is extremely conscious about the environment and seems to always try to be eco friendly.	Research fully into the background of the companies where I have sourced materials from to see if the way they obtain and create their materials is as eco friendly as possible, and has a low carbon footprint. Check that any materials I have used are used to their maximum, with little wasted,
To be able to be hardwearing and withstand effects from environment.	This is because no one will pay for a product that does not excide there expectations.	To last for more than 12 months, while bird house is in use.

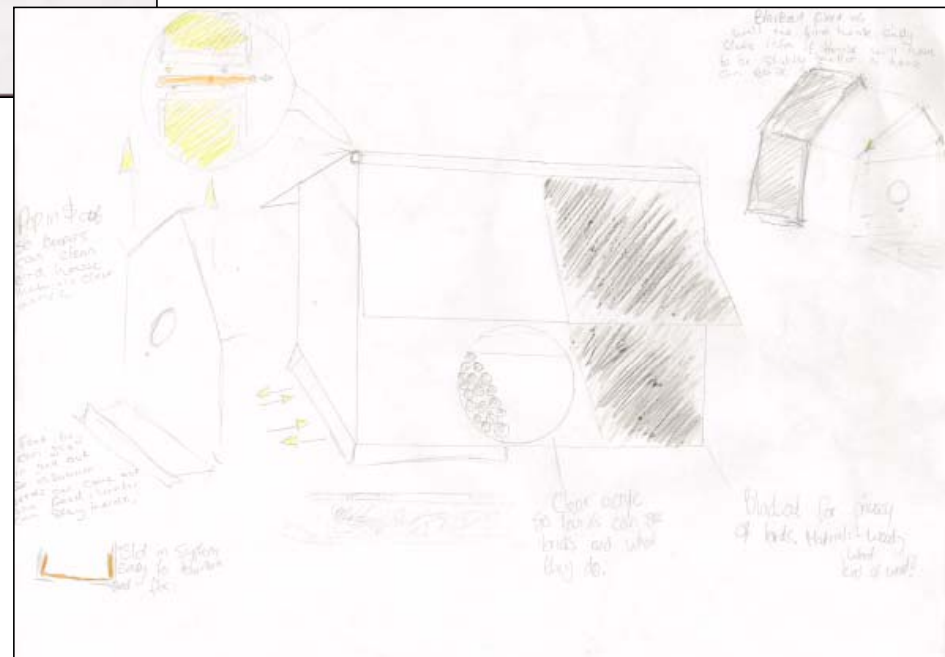
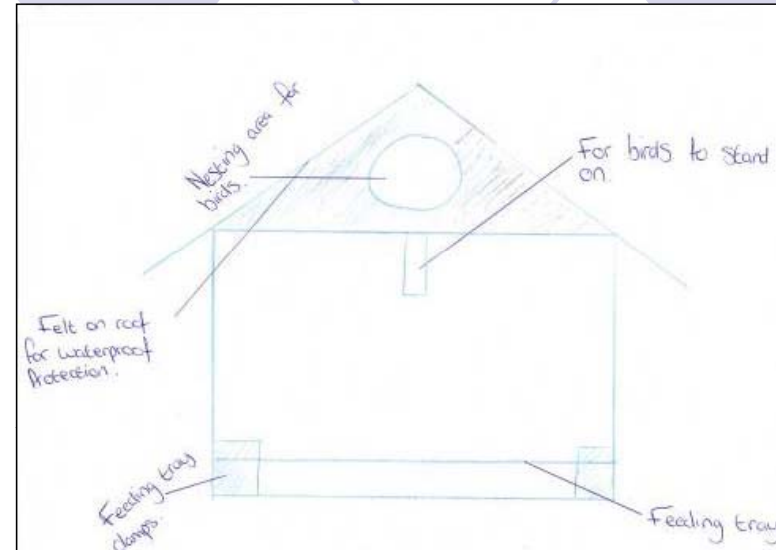
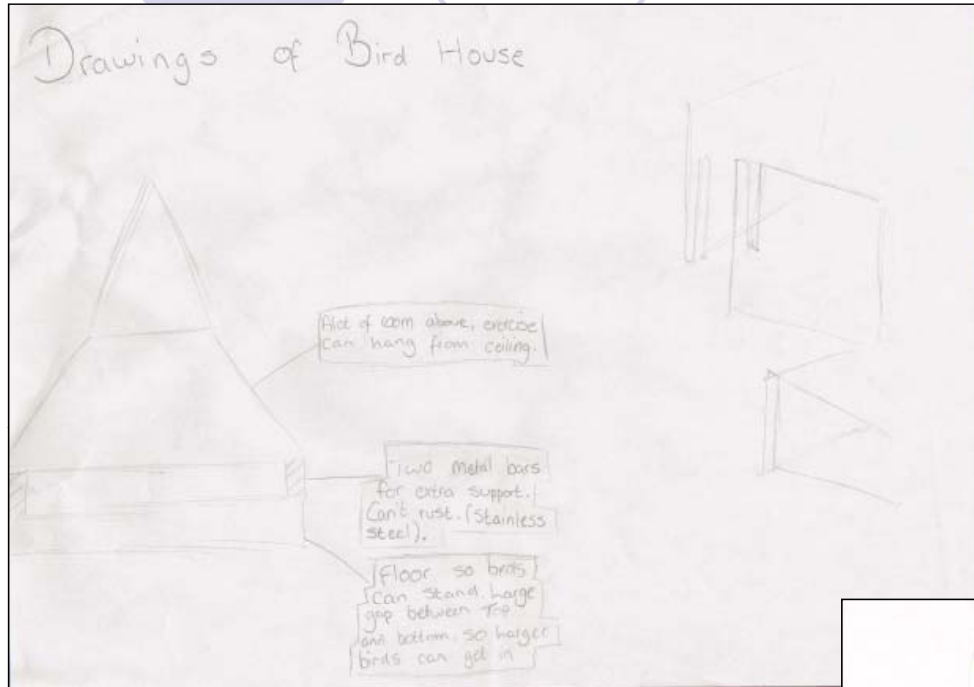


Specification

POINT	JUSTIFICATION	TEST
Roof must be waterproof	Weather will rot wood quickly therefore not lasting very long.	I can prevent this by using green mineral felt.
Colour of house must be discrete, however look professional.	This is because during my research I found out that bright colors attract unwanted predators, this making the bird house unsafe.	By only using dark or neutral colors such as black, green, brown and blues.
Must be able to fit all small birds	In my survey showed that more people would like a small bird house, this could be due to only small birds being common.	I have researched and found out that my bird house size will be large enough to house a single bird, this being 61mm to 80mm.
Must have a feeding facilities.	This is to save space for an extra attachment.	I will incorporate a feeding facility in my manufacturing by having a feeding tray at the bottom on my product.
Must be able to refill food easily.	Zoo keepers do not want to spend a long time have to re-fill bird food.	To achieve this I will use a simple tray design.
To minimise materials, as this will save costs.	This is so I do not waste any materials that could be used else ware, this helping the environment.	To do this I will use bottom corners of material when cutting, I will do this to minimize waste of material.
Product must be 'sturdy'.	This is so that customers are happy with their product and may want to buy extra ones.	When evaluating my product I will judge to see if I have achieved this.
Must complete product in the time given (on time graph).	This is crucial because I will not meet the deadline.	By getting the product finished on time for hand in date.

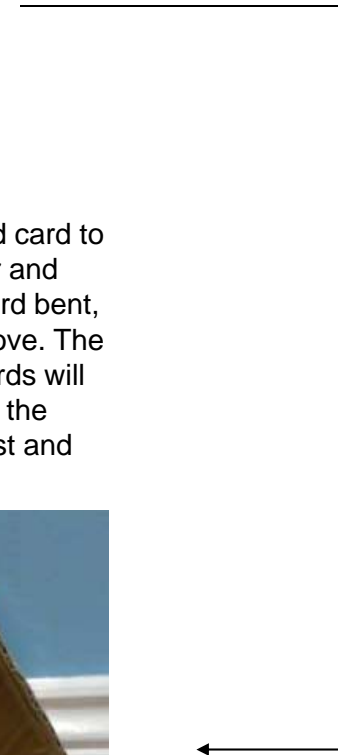
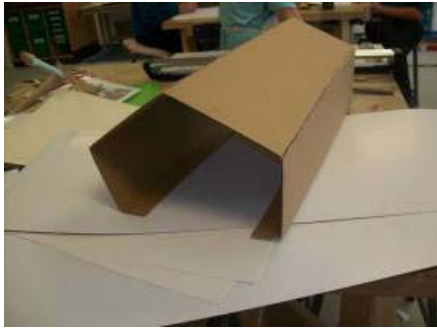


Initial Ideas



Design development 3D Models

Design development 3D Models



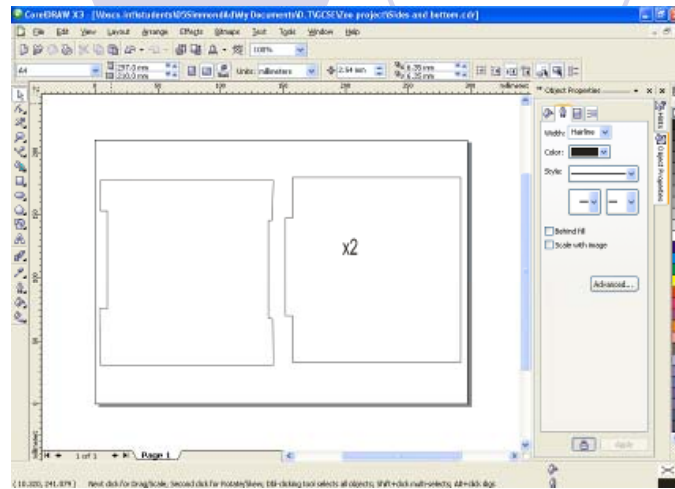
This was my first prototype. I used normal card to produce this, however I soon found out that the card is too flimsy and is not able to keep its shape. Also it was too big and long, so therefore needed to be shorter and use stronger materials.

This was my second prototype. I used corrugated card to produce this. This worked out to be a lot stronger and held its shape. I cut out small inserts where the card bent, and filled in the bends with glue so I could not move. The white paper represents clear acrylic where the birds will feed and wash and the brown section represents the 'blackout' section, where the birds are able to nest and be private.

This is my final prototype. To produce this I used corrugated card again as this is structurally more rigid and held my prototype well last time. This time I have incorporated a feeding facility and to do this I will use a metal sheet and cut holes out of it so birds can peck seeds out of the bottom of the birdhouse. As you can see, the hole in the roof will be used for the birds to nest in, this is an enclosed area therefore making it able for birds to have privacy. The piece of material protruding at the front is a stand for birds to stand on before entering the nesting area.



DESIGN DEVELOPMENT (CAD)

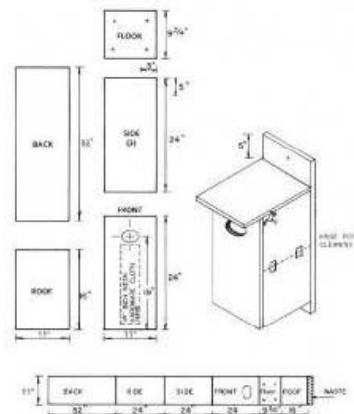


Using 'Corel Draw' (design software on the computer), I have created my finger joint design. I can use this with the router to produce an accurate shape, that should fit flush.

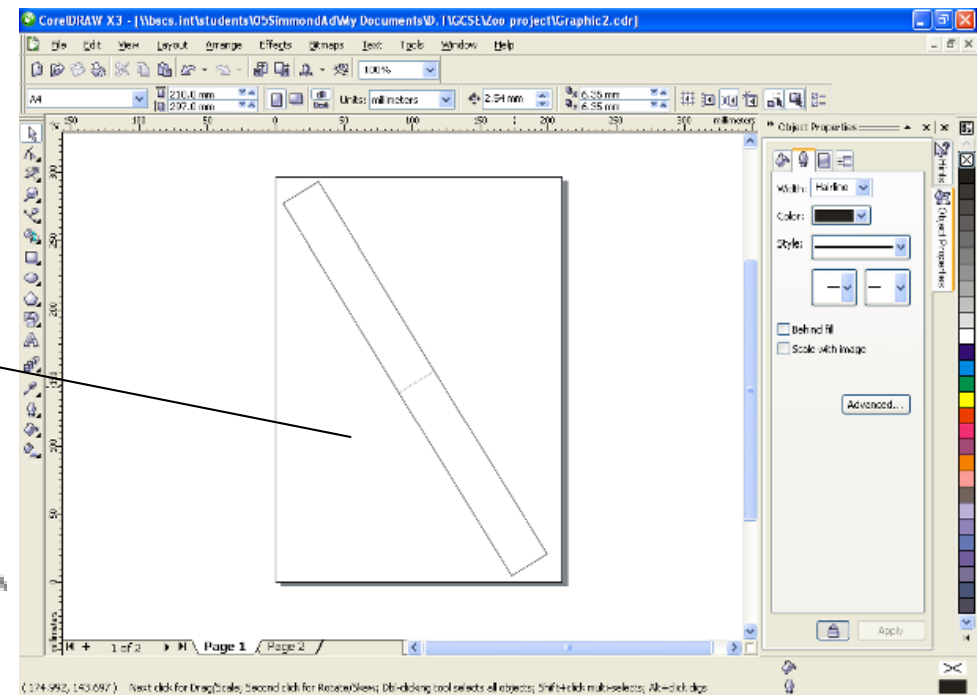
To produce this I had to create 3 rectangles, two being the same size, one being bigger than the others. Next I lined them both up on opposite sides of the larger rectangle, after this I chose the line remover that deleted them lines of the old smaller rectangles just leaving a single line that joined and both perfectly fitted.

The x2 signifies that I will need to cut out two of these.

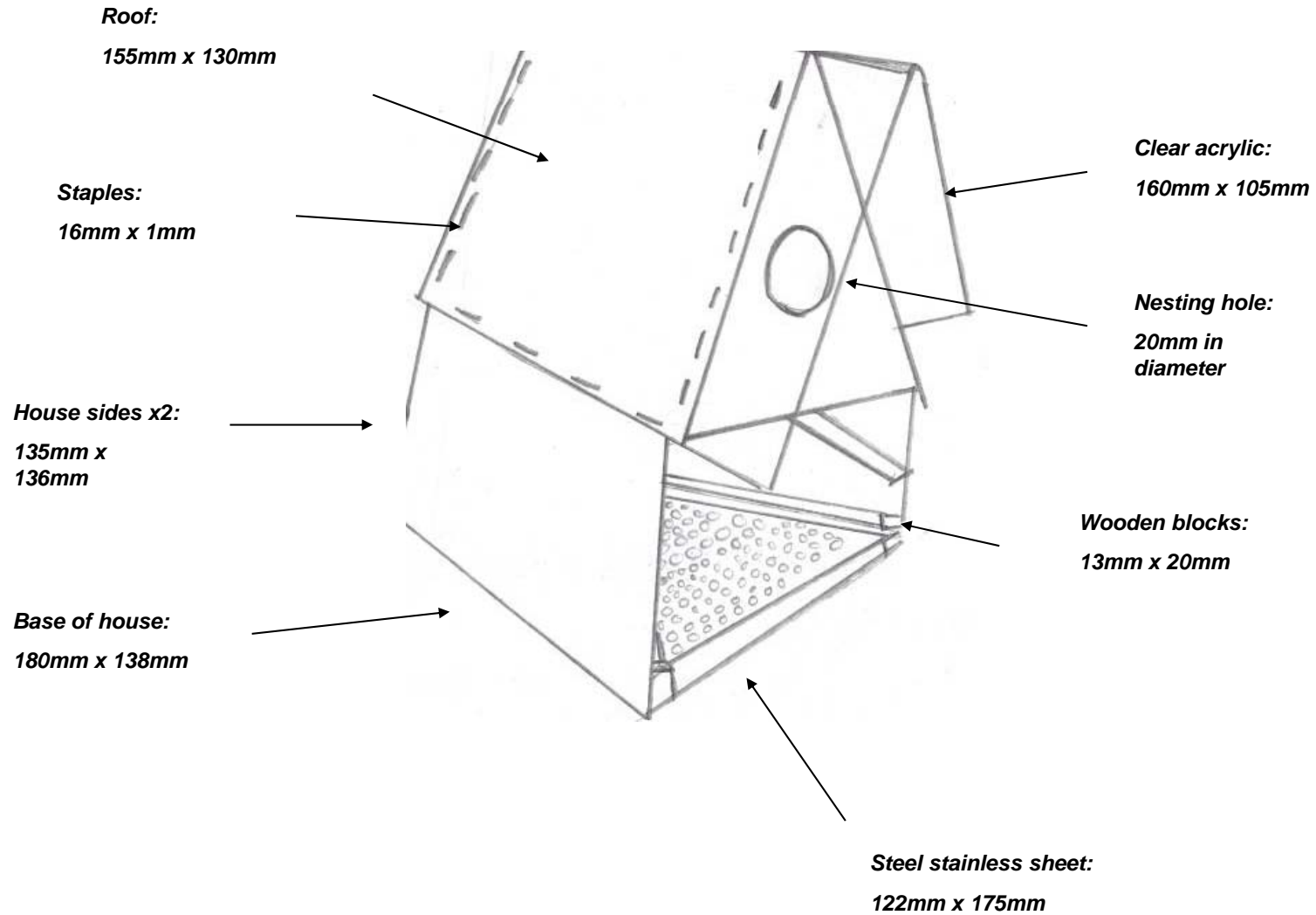
In this diagram I am cutting out my clear acrylic on the laser cutter. I have included a thin line to signify where the acrylic will be bent with heat to fit the roof. I have chosen to cut this out on the laser cutting because it will be more accurate and will look professional.



<http://www.visualsupercomputing.com/wp-content/uploads/images/bird-house-plans-417x500.jpg>



FINAL DESIGN WORKING DRAWING

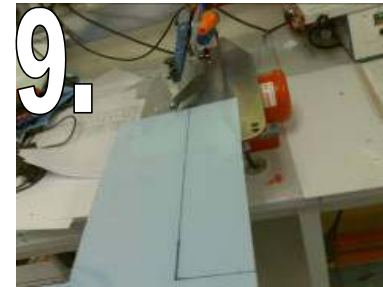
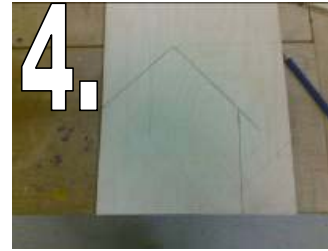


Final Specification

POINT	JUSTIFICATION	TEST
Be able to fit a 'small bird'.	In my survey showed that more people would like a small bird house, this could be due to only small birds being common.	I have researched and found out that my bird house size will be large enough to house a single bird, this being 610mm to 800mm.
To have simple and accessible feeding facilities.	This is so no external feeding unit needs to be attached, this saving space and money.	Make sure that no extra external feeding unit needs to be attached.
To have no bright colours on the bird house.	This is because during my research I found out that bright colors attract unwanted predators, this making the bird house unsafe.	By only using dark or neutral colors such as black, green, brown and blues.
Be able to provide nesting facilities to enable breeding.	This is because bird will only chose to stay in this house, if able to breed successfully.	For box to be used for more than one season and be successful in aiding breeding.
Cost no more than £10.	Will need to cover build costs and make a profit.	Make sure that the amount of materials used to make a bird house does not exceed the price limit in cost.
Be environmentally friendly, e.g. could come from a sustainable resource/ be fully recyclable/ biodegradable, etc.	Bristol zoo is an organisation that is extremely conscious about the environment and seems to always try to be eco friendly.	Research fully into the background of the companies where I have sourced materials from to see if the way they obtain and create their materials is as eco friendly as possible, and has a low carbon footprint. Check that any materials I have used are used to their maximum, with little wasted,
To be able to be hardwearing and withstand effects from environment.	This is because no one will pay for a product that does not excide there expectations.	To last for more than 12 months, while bird house is in use.



MANUFACTURING



PRODUCT TESTING



I believe that my specification is relevant to my product. I believe this because I have done the following things. I am able to fit a small bird in my bird house, I have tested this by actually hanging my product up in my garden and providing essential nesting materials, such as food warmth (sticks) etc, after fitting these items I found a small bird nesting in my bird house. My feeding faculties are simple and accessible, I can prove this, as in my survey 96% of people agreed this. I have achieved this by using a simple push and pull design, it works by a thin steel sheet slotting between four wooden wedges, seeds are added inside the bottom on the bird house, birds peck through the holes in the steel sheet and withdraw their food. My colour choice was relevant, however I could of used a dark brown or green that may have been more effective, this being to ensure that predators are not attracted by the colour, I found this out when conducting my research. I have incorporated nesting facilities in my product, I have done this by adding a nesting area where birds can nest and breed, however to improve this I could cut a smaller hole. After conducting my questionnaire I have found out that everyone who was interviewed would pay £20+ , therefore making a profit, I achieved this on my specification by using long lasting materials that cost little. My product is environmentally friendly, this is because the majority of it is made of wood, however there are some small parts of metal that could be replaced, however these replacements may not be as strong and hardwearing, every material on my bird house can be recycled and re-used. While producing my product I have done this in a environmentally friendly, I have done this by using non corrosive/irritant or any other harmful chemicals. My questionnaire included the question: 'Does the products joints look 'flush'?', 96% of people agreed with this, however I could make this 100% by slightly adjusting one corner to make it more 'flush', When feeling my product I believe that it feels solid and secure. My product can be used outdoor (or indoor if chosen to). This is because my product is rustproof, I have done this by using special types on metals that are rust resistant, for example I have used zinc staples to attach my green mineral felt to the bird house.

MARKET TESTING

I have interviewed 20 people in this questionnaire, these included family members, neighbours and friends.

Questionnaire:

1) Does my product associate to the zoo?

Yes/No

2) Has my product got any colours that may attract unwanted predators?

Yes/No

3) Can you re-fill the feeding facility easily?

Yes/No

4) Does the products joints look 'flush'?

Yes/No

5) Does my products nesting area have enough room for one small bird to nest?

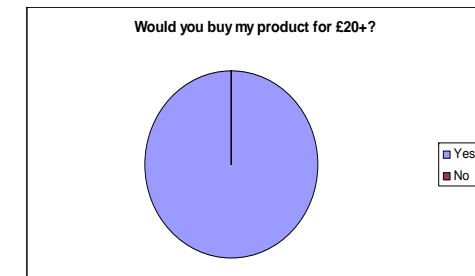
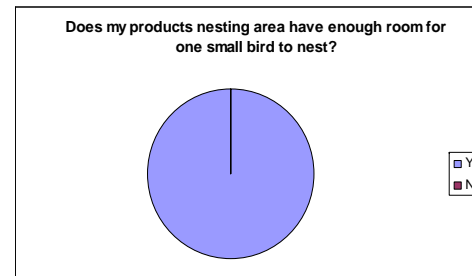
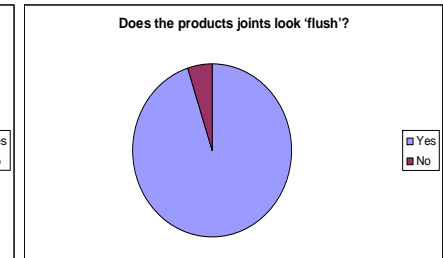
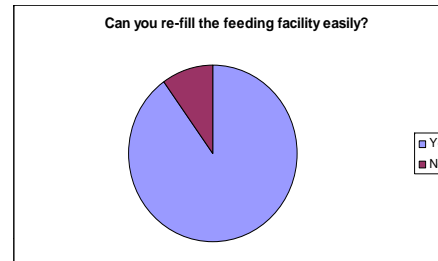
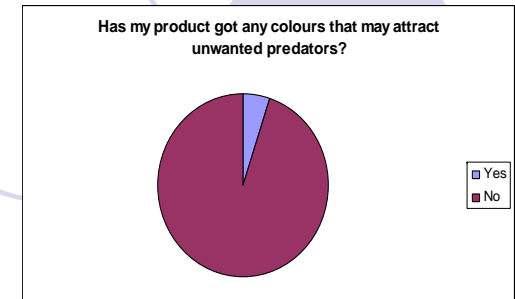
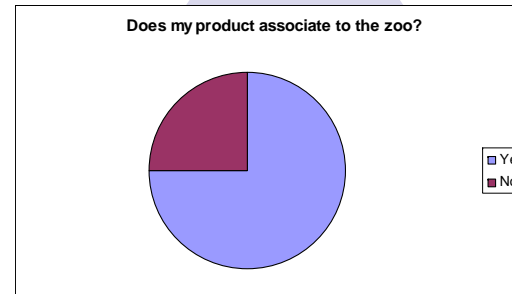
Yes/No

6) Would you buy my product for £20+?

Yes/No

7) Is my product waterproof?

Yes/No



In this survey I asked a number of questions to people to see if I have stuck to my specification, due to these results I have concluded that I have.

Question 1-To make my bird house associate with the zoo more, I need to advertise Bristol Zoo, I can do this by having a sticker on the clear acrylic that could say 'Bristol Zoo'.

Question 2-To get ensure that no predators are attracted, I could use a colour such as dark brown or green as this acts in some what of a camouflage.

Question 3- A few people pointed out the fact that the seed tray was a bit stiff, I can improve this by extending the gap between the two wooden blocks that hold this in place.

Question 4-One person indicated there was a little bit of glue still on the front of the birdhouse, I can easily get rid of this by taking this piece of glue off.

Question 5-Everyone who answered this question agreed that my birdhouse will have enough room for a single small bird to nest.

Question 6-Everyone agreed that my product was worth £20+.

Question 7-Most people agreed that my product was waterproof, but one person pointed out the fact that the wood is not waterproof, however the latex painted that it was has been painted over is so is therefore now waterproof.

FINAL PRODUCT

This is my final product, To achieve this I have gone through a number of steps.

Felt held down my zinc staples, I have used zinc staples because zinc is anti-corrosive therefore lasting longer.

Clear acrylic sheet for sun visor.

Hole for birds to nest inside.

Dry wall screws to hold acrylic in place.

Green mineral felt, I have used this because it is waterproof and hardwearing.

Wooden wedges.

Pole for birds to stand on before entering nesting area.

Stainless steel sheet for feeder. I have used this material as it does not rust and is hygienic.

Finger joint, I have used this joint because it is strong and easy to attach and detach. I have also reinforced this with adhesive glue to maximise wear.



Evaluation of my product

My product works well, I think that for the time scale and budget I had the bird house is cost effective. The materials used are fairly inexpensive and is mainly simple to make in the time space given, however could be made a lot easier if more CAD was/is used. To attach my product together glue is needed or nails can be used as a substitute however if I used only nails my product would not fit my specification as being flush. My product fits my specification and is suitable for the intended use. I believe that my product is good, however would not be able to fit into every setting, this is mainly due to its colour and design, for example my bird house would fit into a modern homes garden, however it would not fit into a forest. My design of my product was specifically for Bristol Zoo, however now this could be bought into the gift shop because it is modern and attractive. The main feature I wanted my product to have was a working food facilities, I have achieved this by having a push and pull tray. My product could come in useful for my personal use if I wanted to attract nature in my garden and create my own food chain. I would buy my product if it was mass produced or seen it in a shop, I would do this because I believe that it is attractive and I have show good craftsman ship by producing it. If I could reproduce my product I would keep the same design, however would use CAD for more parts of my product saving time and human interaction. Doing this could also save further material waste therefore making it more environmentally friendly.

Does my product fulfil my design brief?

Yes, it has done this by 'creating a number of sketches' and 'by introducing birds back into a natural environment'.

Would I buy this product?

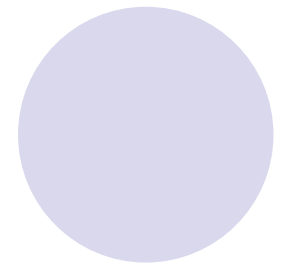
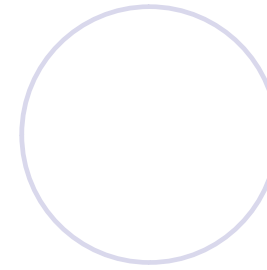
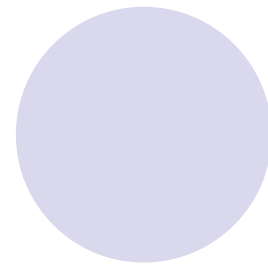
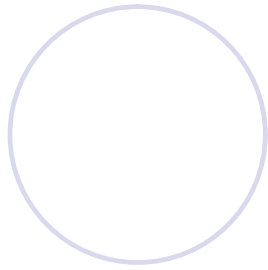
Yes, I would buy this product because it is modern and contemporary and would look nice in my garden. It is also unique as when doing research I have not found another product quite alike, this making is attractive to buying customers.

Are there any things you would change about the product?

Yes, I would change the colour and would also make other bird houses but using the same specification however changing 'small bird' to any bird.



Making



Very simplistic construction. Note poor fit roof to side panels. Acrylic roof extension does not extend to full slope of roof. The construction material is not really suitable. Although there has been a good paint finish applied this is not a recommended finish for birds and therefore not commercially viable



Moderator's comments

Investigating the design context 4 marks

- The student has not fully understood the original brief and it is unclear who the target user is. Initial research is directed very much at a domestic situation rather than the zoo. Product analysis has taken place along with a range of general information gathering. Design criteria is reasonably general.

Development of design proposals 5 marks

- A range of alternative ideas have been superficially explored through drawing and modelling, demonstrating little creativity, originality or flair. There is no obvious design strategy even though the student has collected design stimulus in a range of existing products. Wider issues have been largely ignored. Simple card modelling has taken place. Research into materials and finishes has allowed the student to finalise the design. There is little development undertaken on the design itself and there is not enough detail to attempt third party manufacture.

Making 14 marks

- The making lacks demand but the product is complete and well reasonably finished. Simplistic construction as a result of little planning. Modifications throughout the making.

Testing and Evaluation 3 marks

- Minimal testing was carried out throughout the process. The final evaluation report does make some suggestions for minor changes if commercially produced but industrial understanding is very weak. The student has evaluated against the design criteria and used some third party opinions.

Communication 3 marks

- A presentation which has been reasonably clearly and concisely communicated as an e-submission in PowerPoint. The student demonstrates a limited range of drawing and modelling skills and there are numerous errors in grammar and spelling

Total 29 marks