

Year 11 DT Curriculum Overview (Year 10 June – Year 11 March) 2023-24

Unit Title	Year 11 Sept- Dec	Year 11 Jan- March
Number of lessons	20 lessons	20 lessons
Curriculum content	<p data-bbox="416 411 1137 826">Students should explore a range of possible ideas linking to the contextual challenge selected. These design ideas should demonstrate flair and originality and students are encouraged to take risks with their designs. Students may wish to use a variety of techniques to communicate. Students will not be awarded for the quantity of design ideas but how well their ideas address the contextual challenge selected. Students are encouraged to be imaginative in their approach by experimenting with different ideas and possibilities that avoid design fixation. In the highest band students are expected to show some innovation by generating ideas that are different to the work of the majority of their peers or demonstrate new ways of improving existing solutions.</p> <p data-bbox="416 911 925 938">Section D: Developing design ideas (20 marks)</p> <p data-bbox="416 1023 1126 1436">Students will develop and refine design ideas. This may include, formal and informal 2D/3D drawing including CAD, systems and schematic diagrams, models and schedules. Students will develop at least one model, however marks will be awarded for the suitability of the model(s) and not the quantity produced. Students will also select suitable materials and components communicating their decisions throughout the development process. Students are encouraged to reflect on their developed ideas by looking at their requirements; including how their designs meet the design specification. Part of this work will then feed into the development of a manufacturing specification providing sufficient accurate information for third party manufacture, using a range of appropriate methods, such as</p>	<p data-bbox="1164 411 1641 438">Section E: Realising design ideas (20 marks)</p> <p data-bbox="1164 523 2119 774">Students will work with a range of appropriate materials/components to produce prototypes that are accurate and within close tolerances. This will involve using specialist tools and equipment, which may include hand tools, machines or CAM/CNC. The prototypes will be constructed through a range of techniques, which may involve shaping, fabrication, construction and assembly. The prototypes will have suitable finish with functional and aesthetic qualities, where appropriate. Students will be awarded marks for the quality of their prototype(s) and how it addresses the design brief and design specification based on a contextual challenge.</p> <p data-bbox="1164 858 1675 885">Section F: Analysing and evaluating (20 marks)</p> <p data-bbox="1164 906 2119 1129">Within these iterative design process students are expected to continuously analyse and evaluate their work, using their decisions to improve outcomes. This should include defining requirements, analysing the design brief and specifications along with the testing and evaluating of ideas produced during the generation and development stages. Their final prototype(s) will also undergo a range of tests on which the final evaluation will be formulated. This should include market testing and a detailed analysis of the prototype(s).</p>

Year 11 DT Curriculum Overview (Year 10 June – Year 11 March) 2023-24

	<p>measured drawings, control programs, circuit diagrams, patterns, cutting or parts lists.</p> <p>Section E: Realising design ideas (20 marks)</p> <p>Students will work with a range of appropriate materials/components to produce prototypes that are accurate and within close tolerances. This will involve using specialist tools and equipment, which may include hand tools, machines or CAM/CNC. The prototypes will be constructed through a range of techniques, which may involve shaping, fabrication, construction and assembly. The prototypes will have suitable finish with functional and aesthetic qualities, where appropriate. Students will be awarded marks for the quality of their prototype(s) and how it addresses the design brief and design specification based on a contextual challenge.</p>	
<p>Links to prior learning</p>	<p>Year 9 Foundation- Prototype making in workshop and realising of ideas whilst completing sketch development.</p>	<p>Year 9 Foundation- Prototype making in workshop and realising of ideas whilst completing sketch development.</p>
<p>Cultural capital opportunities</p>	<p>https://www.designweek.co.uk/</p> <p>https://www.youtube.com/watch?v=uzSMAI5AuE</p> <p>Sketching in graphically or realistic method in cartoons:</p> <p>https://www.youtube.com/watch?v=bskgNOXbdiE</p> <p>https://www.youtube.com/watch?v=WJC1qciW_3k</p> <p>https://www.youtube.com/watch?v=DRaLQ3kKz_k</p> <p>https://www.youtube.com/watch?v=iwROgK94zcM</p> <p>https://www.youtube.com/watch?v=PlpUABjD_p0</p>	<p>https://www.youtube.com/watch?v=k_9Q-KDSb9o</p> <p>https://www.youtube.com/watch?v=g6xG-5YtesU</p>

	<p>https://www.youtube.com/watch?v=Ln9oxGf_cos</p> <p>https://www.youtube.com/watch?v=OSBCU7-iBX4</p>	
<p>Assessment focus</p>	<p>Section C: Generating design ideas (20 marks)</p> <p>Imaginative, creative and innovative ideas have been generated, fully avoiding design fixation and with full consideration of functionality, aesthetics and innovation. Ideas have been generated, that take full account of on-going investigation that is both fully relevant and focused. Extensive experimentation and excellent communication is evident, using a wide range of techniques. Imaginative use of different design strategies for different purposes and as part of a fully integrated approach to designing.</p> <p>Section D: Developing design ideas (20 marks)</p> <p>Very detailed development work is evident, using a wide range of 2D/3D techniques (including CAD where appropriate) in order to develop a prototype.</p> <p>Excellent modelling, using a wide variety of methods to test their design ideas, fully meeting all requirements. Fully appropriate materials/components selected with extensive research into their working properties and availability. Fully detailed manufacturing specification is produced with comprehensive justification to inform manufacture.</p>	<p>Section E: Realising design ideas (20 marks)</p> <p>The correct tools, materials and equipment (including CAM where appropriate) have been consistently used or operated safely with an exceptionally high level of skill.</p> <p>A high level of quality control is evident to ensure the prototype is accurate by consistently applying very close tolerances. Prototype shows an exceptionally high level of making/finishing skills that are fully consistent and appropriate to the desired outcome. An exceptionally high quality prototype that has the potential to be commercially viable has been produced and fully meets the needs of the client/user.</p> <p>Differentiation of Learning Objectives (with desired outcomes for students of different levels of ability).</p> <p>Section F: Analysing and evaluating (20 marks)</p> <p>Extensive evidence that various iterations are as a direct result of considerations linked to testing, analysis and evaluation of the prototype, including well considered feedback from third parties. Comprehensive testing of all aspects of the final prototype against the design brief and specification. Fully detailed and justified reference is made to any modifications both proposed and undertaken. Excellent ongoing analysis and evaluation evident throughout the project that clearly influences the design brief and the design and manufacturing specifications.</p> <p>After NEA all Theory covered in Year 10 will be repeated through past papers and exercises.</p>

Year 11 Sept- March

GCSE Design and Technology- Non-exam assessment (NEA)
Duration: June to March (Year 10 and 11)
What's assessed
 Practical application of:

- Core technical principles
- Specialist technical principles
- Designing and making principles

How it's assessed

- Non-exam assessment (NEA): 30–35 hours approx
- 100 marks
- 50% of GCSE.

Section A: Identifying & investigating design possibilities (10 marks)

By analysing the contextual challenge students will identify design possibilities, investigate client needs and wants and factors including economic and social challenges. Students should also use the work of others (past and/or present) to help them form ideas. Research should be concise and relate to their contextual challenge. Students are also advised to use a range of research techniques (primary/secondary) in order to draw accurate conclusions. Students should be encouraged to investigate throughout their project to help inform decisions.

Sections of work:

All pupils will have to complete the following areas of research to be deemed successful:

- Design Problems/ Brief/ Consumer Profile
- Ergonomics / Anthropometrics
- Materials Manipulation Practical
- Materials Research
- Environment
- Potential user.

Ergonomics

- Science element to all aspects of design.
- Applying research and understanding of the human form and how it interacts with a particular product
- It has an affect on the design process of products ranging from a toothbrush, mobile phone to a car.
- Ergonomics is therefore an essential part of any design process
- One of the main objectives in applying ergonomics in a designed product is to improve people's lives by increasing comfort or satisfaction

Anthropometrics

- This is part of ergonomics.
- These are measurements that are taken from human beings; in particular the different shapes and sizes
- Dimensions of the human form
- Such as height, width or length
- This can be such things as hands, heads and feet *etc...*
- When designers use this data, they aim to provide a match in their product for the greatest possible number of users.
- Most companies use the **BSI**.

Consumer Profile

A **consumer profile** is to come up with someone who would buy a product. A consumer profile includes age, gender, status, income, disposable income, interests and hobbies. This suggests what a **consumer** to a certain product would be and act like. It is also to gain an understanding of who you would sell your product to and potentially sell your product to.

Name: Joe Walker

Example:

Age: 18
 Gender: Male
 Status: Single
 Income: £14,000
 Disposable income: £600
 Interests: Video games, sports
 Hobbies: Gaming, Playing football
 Consume: Mainly online, shops, Games, Clothes

Environmental Issues

It is important in today's society to consider the environment and how sustainable a selected material actually is. As a designer you have a huge responsibility in providing a greener as possible solution when designing a product. This means the manufacture and use of a product has to be better for the environment as it can be

Plastic

The materials I can choose from with the resources I have in school are the following: Acrylic, HIPS, Polymorph and Styrofoam. Plastics can have a negative image with regards to the environment. This is because it requires crude oil to create a plastic. You also need coal to heat furnaces that helps create the heat to mould plastics. This is bad for the environment because it releases CO2 into the atmosphere which is bad for the environment. Even if you recycle plastic s it emits more CO2 into the atmosphere, because you have to remould it into new shapes. When recycling plastic they can only be recycled a number of times because they degrade in quality as well.

Paper and Board

Paper and board are produced from wood. Trees can be renewable because they can be replanted after one is cut down. This does not mean we can be wasteful as this material can be discarded to the figure of millions of tonnes per year in Britain alone. Paper and boards can be recycled, however like plastic they can degrade in quality. You can also use paper and boards that are sourced from sustainable forests which use softwood trees, which take less time to grow.

Manufactured Boards

The materials I can choose from with the resources I have in school are the following: MDF and plywood. MDF is medium density fibreboard, it is an engineered wood product formed by breaking down softwood into wood fibres, combining it with wax and a resin binder, and forming panels by applying high temperature and pressure. So in terms of sustainability if it is made from wood from managed forests then it can be sustainable. Some energy used in its production.

Woods

Pine wood can also be sustainable if it is from managed, 'farmed' forests where new trees are plant to replace ones harvest in a continuous cycle. Pine trees are soft wood that is fast growing. Pine is softwood this means it takes 30 years till it matures ready for processing. This means it is a far more sustainable wood than hardwoods that take 100-125 years before they are mature.

Design Brief

This a short statement. Normally it explains how the design situation (problem) is going to be solved. It can also explain what is required.

Design Problem

This is a written statement sometimes explaining why something is needed or required.

Design Brief

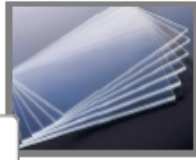
This a short statement. Normally it explains how the design situation (problem) is going to be solved. It can also explain what is required.

Design Problem

This is a written statement sometimes explaining why something is needed or required.

In this section of my coursework I will be researching possible materials to make my product out of. For the main reason I will be making the design on a school budget, there will be a limit on choices of actual material I can possibly use.

High Impact Polystyrene



This material can also be known as HIPS. It is a thermoplastic which makes it ideal for use on the Vacuum Former. This material can come in a wide of colours. It is a lightweight material and it has a low water absorption. This material is commonly used in colleges and school for design projects.

MDF

This is one of the most commonly used composite materials. MDF is mainly made up of scrap and waste wood (softwood) in the form of wood chips; this is mixed with adhesive resins and then compressed into boards. Used in the building and furniture trades. A quality board, relatively cheap. Paint can be applied to it without the need for an undercoat or primer. Heavy used in schools and colleges. Also stocked in the school I attend constantly.

Plywood



This is another manmade board. Also commonly used in schools and colleges. This is made from veneers (plies) of timber with each grain layer being at right angles to each other and bonded together by resin and pressure. This is a cost effective material. It is not a great for sanding or shaping.

Acrylic

This material is a type of plastic. Acrylic can come in a large range of colours in sheets, tubes and rods. Acrylic can sometimes be clear or frosted in appearance. Acrylic can also be used as low cost and lightweight substitute to glass. It is a low cost material compared to glass. It is Hard and Rigid and has a good surface finish. It also has great aesthetical qualities. This would make an ideal material in a component for making my design.

Polymorph

This material is a plastic. You can mould it into shapes when the material reaches the temperature of 62 degrees. This can be done by placing in to boiled water. It is mainly used in model making and simple prototypes.

Pine

This material is softwood. Is a relatively cheap wood used in the building trade and for furniture. It is pale in colour, quite easy to cut and shape, and machines relatively well. This material is probably one of the most commonly used in schools and colleges. This wood is probably one of the more sustainable woods.

Styrofoam

This foam is blue or pink extruded polystyrene foam. This material can be used for insulating buildings in construction. However it is excellent for use as a modelling material. Styrofoam is easily cut and shaped with normal hand tools and it can be sanded smooth. Styrofoam is also available in a range of thicknesses. It can be glued together to achieve larger blocks using PVA glue. It can be painted using acrylic paints. Plaster or car body fillers can be applied to Styrofoam and then sanded to gain a finer finish.

Disadvantages of using Styrofoam:

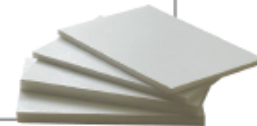
- It can become weak and the surface can begin to break up.
- Therefore it is unsuitable for models that require fine detail.
- The surface of this foam can also become dented.



Foam Board

This is white in appearance, it has three layers. Top and bottom layer are gloss paper with a section of foam in the middle. It is excellent to make architectural models or simple prototypes. It can be cut easily cut when using a knife and can be bonded together using tape or glues.

Card



Card is a lot thicker than paper and can be a good material to create prototypes with. It has a range of uses; printing, drawing, 3D modelling and presentation work. It can come in a wide range of colours. However it can be abit more expensive than paper. Good materials to make nets from or simple mock up models.

GCSE Design and Technology- Non-exam assessment (NEA)
Duration: June to March (Year 10 and 11)
What's assessed
Practical application of:

- Core technical principles
- Specialist technical principles
- Designing and making principles

How it's assessed

- Non-exam assessment (NEA): 30–35 hours approx
- 100 marks
- 50% of GCSE.

Section B: Producing a design brief & specification (10 marks)

Comprehensive design brief which clearly justifies how they have considered their user/client's needs and wants and links directly to the context selected. Comprehensive design specification with very high level of justification linking to the needs and wants of the client/user. Fully informs subsequent design stages.

Useful websites:

<http://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-8552>

<http://www.technologystudent.com/>

<https://www.bbc.com/education/subjects/zvg4d2p>

Function
Answer the questions in full sentences/ paragraph
What type of product is it?
Is the product based on a design movement?
Example Art Deco.
What is it going to be stored in this product?
Will it have any special feature?
Do you want your product to have more than just functional qualities? Example decorative.

Manufacture
During the manufacture of this product I will be using a range of machines and hand tools. Which machines and tools selected will depend on the design of the product itself and what manufacturing demands are required. To achieve a high grade in my project, I will have to demonstrate a range of automated and hand skills in the manufacturing of my product. The range of hand tools will probably be from the following:

- Tenon saw
- Coping Saw
- Hand file
- Try square
- Sanding block
- Bench hook
- Bench vice
- Engineers vice
- Chisels
- Steel Rule
- Sliding Bevel
- Mortise gauge
- Mitre saw

Machines of automated tools will possibly be from the following:

- Computer
- Printer
- Laser cutter
- Scroll saw
- Band saw
- Pillar/ bench drill
- Orbital sander
- Disc sander
- Jigsaw
- Power drill

Materials
For the main reason I will be making the design on a school budget, there will be a limit on choices of actual material I can possibly use. These materials will be from the following:

- MDF
- Pine
- Plywood
- HIPS
- Acrylic
- Mild Steel
- Hard Board
- Polymorph.

Aesthetics
This means how visually appealing something is. Aesthetics needs to be considered when designing and manufacturing my design.
Answer the following questions, but write in a full sentences/ paragraph
What will the colour scheme be? *Acrylic paint, vanish/ polish, colourful laser cut plastic decoration.*
What is the basic shape of the product? Cube, cuboid, cylinder other.
Why is it important to make something visually appealing? *Answer in full sentences.*
Is the selection of materials and finishing (assembly, paint, vanish and sanding) important to improve the visual quality of the product.

Safety
When manufacturing this product it is important that I make it safe as possible. I could do this when on machinery such as pillar drill, scroll saw or any other machines. I will listen to instruction from teacher or technician. Follow safety advice which will be placed on wall near machine. Wear apron, hand tired back or safety goggles or ear defenders if required. If any machines I am not allowed to use because of laws like the brand saw, I will ask teacher or technician to complete this task for me. Ventilate the room when sanding, wear protective clothing, google, mask or even ear defenders.
Safety of using the product. When a product is manufactured and sold it has to adhere to safety rules/ laws. For product this will be no loose components, non-toxic paint used in the manufacturing of the item. Not to heavy so when it is picked up it does not cause any unnecessary injury. If the unit has any doors or lids, they are not manufacture or used in a dangerous way.

GCSE Design and Technology- Non-exam assessment (NEA)
Duration: June to March (Year 10 and 11)
What's assessed
 Practical application of:

- Core technical principles
- Specialist technical principles
- Designing and making principles

How it's assessed

- Non-exam assessment (NEA): 30–35 hours approx
- 100 marks
- 50% of GCSE.

Section A: Identifying & investigating design possibilities (10 marks)

By analysing the contextual challenge students will identify design possibilities, investigate client needs and wants and factors including economic and social challenges. Students should also use the work of others (past and/or present) to help them form ideas. Research should be concise and relate to their contextual challenge. Students are also advised to use a range of research techniques (primary/secondary) in order to draw accurate conclusions. Students should be encouraged to investigate throughout their project to help inform decisions.

Sections of work:

All pupils will have to complete the following areas of research to be deemed successful:

Design Problems/ Brief/ Consumer Profile
 Ergonomics / Anthropometrics
 Materials Manipulation Practical
 Materials Research
 Environment
 Potential user.

Ergonomics

- Science element to all aspects of design.
- Applying research and understanding of the human form and how it interacts with a particular product
- It has an affect on the design process of products ranging from a toothbrush, mobile phone to a car.
- Ergonomics is therefore an essential part of any design process
- One of the main objectives in applying ergonomics in a designed product is to improve people's lives by increasing comfort or satisfaction

Anthropometrics

- This is part of ergonomics.
- These are measurements that are taken from human beings; in particular the different shapes and sizes
- Dimensions of the human form
- Such as height, width or length
- This can be such things as hands, heads and feet *etc...*
- When designers use this data, they aim to provide a match in their product for the greatest possible number of users.
- Most companies use the **BSI**.

Consumer Profile

A **consumer profile** is to come up with someone who would buy a product. A consumer profile includes age, gender, status, income, disposable income, interests and hobbies. This suggests what a **consumer** to a certain product would be and act like. It is also to gain an understanding of who you would sell your product to and potentially sell your product to.

Name: Joe Walker

Example:

Age: 18
 Gender: Male
 Status: Single
 Income: £14,000
 Disposable income: £600
 Interests: Video games, sports
 Hobbies: Gaming, Playing football
 Consume: Mainly online, shops, Games, Clothes

Environmental Issues

It is important in today's society to consider the environment and how sustainable a selected material actually is. As a designer you have a huge responsibility in providing a greener as possible solution when designing a product. This means the manufacture and use of a product has to be better for the environment as it can be

Plastic

The materials I can choose from with the resources I have in school are the following: Acrylic, HIPS, Polymorph and Styrofoam. Plastics can have a negative image with regards to the environment. This is because it requires crude oil to create a plastic. You also need coal to heat furnaces that helps create the heat to mould plastics. This is bad for the environment because it releases CO2 into the atmosphere which is bad for the environment. Even if you recycle plastic s it emits more CO2 into the atmosphere, because you have to remould it into new shapes. When recycling plastic they can only be recycled a number of times because they degrade in quality as well.

Paper and Board

Paper and board are produced from wood. Trees can be renewable because they can be replanted after one is cut down. This does not mean we can be wasteful as this material can be discarded to the figure of millions of tonnes per year in Britain alone. Paper and boards can be recycled, however like plastic they can degrade in quality. You can also use paper and boards that are sourced from sustainable forests which use softwood trees, which take less time to grow.

Manufactured Boards

The materials I can choose from with the resources I have in school are the following: MDF and plywood. MDF is medium density fibreboard, it is an engineered wood product formed by breaking down softwood into wood fibres, combining it with wax and a resin binder, and forming panels by applying high temperature and pressure. So in terms of sustainability if it is made from wood from managed forests then it can be sustainable. Some energy used in its production.

Woods

Pine wood can also be sustainable if it is from managed, 'farmed' forests where new trees are plant to replace ones harvest in a continuous cycle. Pine trees are soft wood that is fast growing. Pine is softwood this means it takes 30 years till it matures ready for processing. This means it is a far more sustainable wood than hardwoods that take 100-125 years before they are mature.

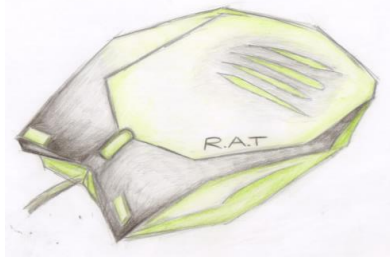
Design Brief

This a short statement. Normally it explains how the design situation (problem) is going to be solved. It can also explain what is required.

Design Problem

This is a written statement sometimes explaining why something is needed or required.

Initial Sketches



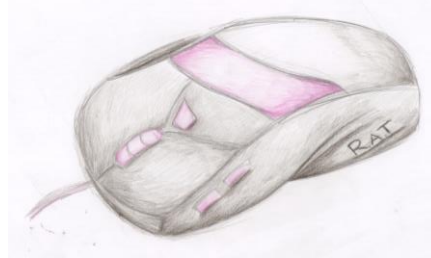
Function: The mouse is intended to be a gaming mouse, so it needs a few more features compared to the standard mouse. These include a rapid-fire button, this is a double click but you only have to click once, this makes it easier to shoot in some games, and minimises the amount of time it takes to double click. There's the conventional left click, right click and scroll wheel, but there is also a DPI button which changes the speed at which the cursor moves; the higher the DPI the less movement you need to physically do to move the cursor on the screen. It is also wired, so there is no extra weight from batteries, and no chance of the mouse dying in the middle of a game; which is very annoying. This mouse is aimed at the higher end gamer who would typically spend a lot of time gaming.

Aesthetics: The overall shape to the controller has a very space, retro feel to it. Its edges are not rounded like conventional mice, this is what would make it stand out from the rest of the market. The colours are bold and contrast each other to make them look bolder and brighter. The slash marks at the top of the mouse, would change colour to give it a more expensive feel, in which the user could change using one of the buttons.

Materials: The body of the mouse will be made from ABS, because ABS has a high strength to weight ratio, meaning that a thin amount of this plastic will still be very strong. This means that the mouse can be made light but strong, which will help with RSI, and makes it more cost effective to make, and more sustainable because less material is needed.. The ABS should be textured in a way that gives the person grip.

Ergonomics: The shape, gives the fingers a comfortable position, this will stop from any strain after a long time. There is a rest on either side of the mouse for the little finger to sit on and the thumb, since you don't tend to use these fingers when using a mouse. The buttons are large and so is the main body of the mouse, this means it will fit comfortably within the palm of the hand.

Manufacturing: Ultimately, this mouse would be made from two components; the top and the base. To make the curves natural I would need to make some sort of mould that I could bend the heated ABS and mould, because ABS is a thermoplastic this will be possible. The buttons will be made by cutting the ABS and making them thinner which means they can bend and will then press the buttons on the inside to make the function happen. This design is feasible but with the lack of equipment in the school I wouldn't be able to bend and shape it and have it look fluid.



Function: Even though this mouse looks simple, it has all the features of which a gaming mouse would require. It has your normal left click, right click and scroll wheel, but it also has a DPI button, so you can change the level of DPI and it also has two extra buttons that can vary to what they do, depending on what you could need for any game. Like the previous mouse, it has a wire to lessen the weight and stop the mouse from dying mid game. The mouse is simple yet effective because it has what a casual gamer would need, maybe not for the higher end gamers, but defiantly for the average ones.

Aesthetics: The mouse itself is rounded, to fit comfortably within the palm of the hand. The mouse domes at the top, so the fingers work with gravity, as they point downwards, relieving stress. The colours on the mouse change, they go through the colour spectrum, so it is appealing to both male and female.

Materials: The body of the mouse will be made from ABS, because ABS has a high strength to weight ratio, meaning that a thin amount of this plastic will still be very strong. This means that the mouse can be made light but strong, which will help with RSI, and makes it more cost effective to make, and more sustainable because less material is needed. The ABS should be textured in a way that gives the person grip.

Ergonomics: the curvature of the mouse's body makes it easy and comfortable to hold, it curves to the shape of the hand and not the other way round. There are points to put the little finger and the thumb, giving them a rest. The left and right click button are domed inwards so the fingers can rest with in the shape.

Manufacture: To make the actual product would be fine, but to make the prototype out of ABS wouldn't work because I would not be able to get the curves and shape of the mouse from ABS because we don't have the equipment in school, however I would be able to do this using Pine or Oak because I'll have one solid block that I could shape with a chisel and sanding. To get the indented curves would need a round file and would take a lot of time, but I would be able to do it. The buttons would be separate and would be cut using the jigsaw, they would be made from MDF because it is very abundant and easy to shape.



Function: Unlike the others, this mouse only has the left and the right click. It has a scroll wheel and that is it. I've given it a very simplistic look so it doesn't look intimidating like some of the other mice do and will be easy to use. It's simple and would be aimed at the lower end gamer, and could even be used by a non gamer entirely, because it has a modern sleek look, it would sit comfortably with in an office environment. It is wireless and will use blue tooth to connect with the computer, meaning it comes with a little USB connector to plug into the computer/laptop.

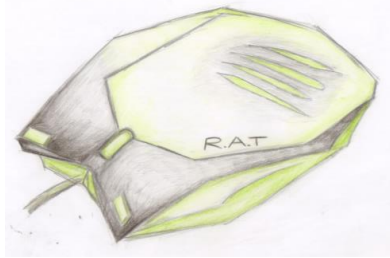
Aesthetics: It is a very basic looking mouse, and doesn't have any flashy lights or lots of different buttons. The sleek simplistic look is very popular today. The black and the white contrast each other and it looks very pure. The flawless curve makes the viewers eyes flow over the whole mouse and the solid block shape makes it easy to look at, there are no crazy patterns or colours to distract the eye from the curves of the mouse itself.

Materials: The body of the mouse would be made from Acrylic, because it is a cost effective material which can be finished to give it a smooth glossy surface; which would help with the sleek look. An alternative material could be a metal which is given a matt finish. For this the mouse wouldn't be in black and white, but in gun grey. This would give it an almost car like look, like a Jaguar. The scroll wheel would be textured ABS, probably rubberised, this will mean it's long lasting and comfortable because there would be extra grip.

Ergonomics: The whole mouse is a curve. This will force the users hand to sit in a comfortable position. The height of the mouse is very low meaning the thumb and the little finger can rest on the surface the mouse is on.

Manufacture: This mouse is very simple and would be easy to make out of MDF by layering it with cuttings from the laser cutter which I would have designed in 2D Design and then printed on the laser cutter. Alternatively I could make it from one solid piece of wood, like Pine or Oak, and sand it down into the shapes and curves I want. This would be easy because it is one solid curve. The Trackball would also be made from MDF or Pine and would be shaped on the jigsaw and finished with the sander. Compared to all the other designs this would be the easiest because there are no inward curves and then shape can be easily made using the sanders.

Initial Sketches



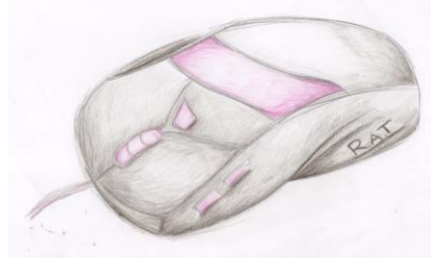
Function: The mouse is intended to be a gaming mouse, so it needs a few more features compared to the standard mouse. These include a rapid-fire button, this is a double click but you only have to click once, this makes it easier to shoot in some games, and minimises the amount of time it takes to double click. There's the conventional left click, right click and scroll wheel, but there is also a DPI button which changes the speed at which the cursor moves; the higher the DPI the less movement you need to physically do to move the cursor on the screen. It is also wired, so there is no extra weight from batteries, and no chance of the mouse dying in the middle of a game; which is very annoying. This mouse is aimed at the higher end gamer who would typically spend a lot of time gaming.

Aesthetics: The overall shape to the controller has a very space, retro feel to it. Its edges are not rounded like conventional mice, this is what would make it stand out from the rest of the market. The colours are bold and contrast each other to make them look bolder and brighter. The slash marks at the top of the mouse, would change colour to give it a more expensive feel, in which the user could change using one of the buttons.

Materials: The body of the mouse will be made from ABS, because ABS has a high strength to weight ratio, meaning that a thin amount of this plastic will still be very strong. This means that the mouse can be made light but strong, which will help with RSI, and makes it more cost effective to make, and more sustainable because less material is needed.. The ABS should be textured in a way that gives the person grip.

Ergonomics: The shape, gives the fingers a comfortable position, this will stop from any strain after a long time. There is a rest on either side of the mouse for the little finger to sit on and the thumb, since you don't tend to use these fingers when using a mouse. The buttons are large and so is the main body of the mouse, this means it will fit comfortably within the palm of the hand.

Manufacturing: Ultimately, this mouse would be made from two components; the top and the base. To make the curves natural I would need to make some sort of mould that I could bend the heated ABS and mould, because ABS is a thermoplastic this will be possible. The buttons will be made by cutting the ABS and making them thinner which means they can bend and will then press the buttons on the inside to make the function happen. This design is feasible but with the lack of equipment in the school I wouldn't be able to bend and shape it and have it look fluid.



Function: Even though this mouse looks simple, it has all the features of which a gaming mouse would require. It has your normal left click, right click and scroll wheel, but it also has a DPI button, so you can change the level of DPI and it also has two extra buttons that can vary to what they do, depending on what you could need for any game. Like the previous mouse, it has a wire to lessen the weight and stop the mouse from dying mid game. The mouse is simple yet effective because it has what a casual gamer would need, maybe not for the higher end gamers, but defiantly for the average ones.

Aesthetics: The mouse itself is rounded, to fit comfortably within the palm of the hand. The mouse domes at the top, so the fingers work with gravity, as they point downwards, relieving stress. The colours on the mouse change, they go through the colour spectrum, so it is appealing to both male and female.

Materials: The body of the mouse will be made from ABS, because ABS has a high strength to weight ratio, meaning that a thin amount of this plastic will still be very strong. This means that the mouse can be made light but strong, which will help with RSI, and makes it more cost effective to make, and more sustainable because less material is needed. The ABS should be textured in a way that gives the person grip.

Ergonomics: the curvature of the mouse's body makes it easy and comfortable to hold, it curves to the shape of the hand and not the other way round. There are points to put the little finger and the thumb, giving them a rest. The left and right click button are domed inwards so the fingers can rest with in the shape.

Manufacture: To make the actual product would be fine, but to make the prototype out of ABS wouldn't work because I would not be able to get the curves and shape of the mouse from ABS because we don't have the equipment in school, however I would be able to do this using Pine or Oak because I'll have one solid block that I could shape with a chisel and sanding. To get the indented curves would need a round file and would take a lot of time, but I would be able to do it. The buttons would be separate and would be cut using the jigsaw, they would be made from MDF because it is very abundant and easy to shape.



Function: Unlike the others, this mouse only has the left and the right click. It has a scroll wheel and that is it. I've given it a very simplistic look so it doesn't look intimidating like some of the other mice do and will be easy to use. It's simple and would be aimed at the lower end gamer, and could even be used by a non gamer entirely, because it has a modern sleek look, it would sit comfortably with in an office environment. It is wireless and will use blue tooth to connect with the computer, meaning it comes with a little USB connector to plug into the computer/laptop.

Aesthetics: It is a very basic looking mouse, and doesn't have any flashy lights or lots of different buttons. The sleek simplistic look is very popular today. The black and the white contrast each other and it looks very pure. The flawless curve makes the viewers eyes flow over the whole mouse and the solid block shape makes it easy to look at, there are no crazy patterns or colours to distract the eye from the curves of the mouse itself.

Materials: The body of the mouse would be made from Acrylic, because it is a cost effective material which can be finished to give it a smooth glossy surface; which would help with the sleek look. An alternative material could be a metal which is given a matt finish. For this the mouse wouldn't be in black and white, but in gun grey. This would give it an almost car like look, like a Jaguar. The scroll wheel would be textured ABS, probably rubberised, this will mean it's long lasting and comfortable because there would be extra grip.

Ergonomics: The whole mouse is a curve. This will force the users hand to sit in a comfortable position. The height of the mouse is very low meaning the thumb and the little finger can rest on the surface the mouse is on.

Manufacture: This mouse is very simple and would be easy to make out of MDF by layering it with cuttings from the laser cutter which I would have designed in 2D Design and then printed on the laser cutter. Alternatively I could make it from one solid piece of wood, like Pine or Oak, and sand it down into the shapes and curves I want. This would be easy because it is one solid curve. The Trackball would also be made from MDF or Pine and would be shaped on the jigsaw and finished with the sander. Compared to all the other designs this would be the easiest because there are no inward curves and then shape can be easily made using the sanders.

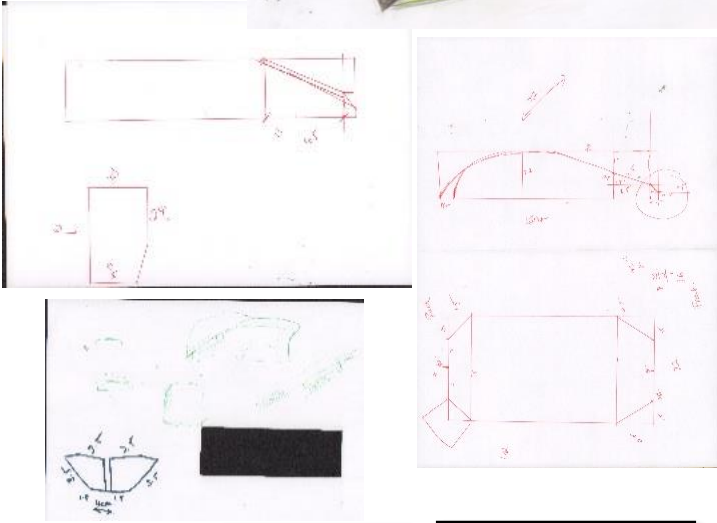
Development Process



Initial Idea to Develop

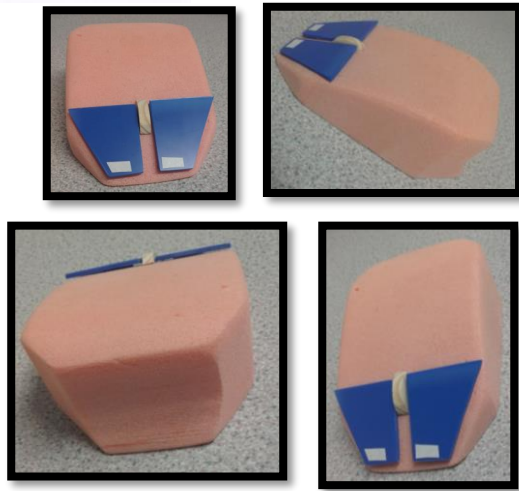
This is the sketch that I will be using to help develop an ergonomic mouse, it is the baseline of what I want to develop.

- It has a wide base to give the person maximum grip, and comfort. So they don't have to cramp their hand up trying to hold a mouse that is too small.
- The mouse is the better looking of the designs because it is more RAT looking and looks like a gaming mouse.
- The bold colours and shape make it look retro and space like. This made it stand out from the rest of the sketches.

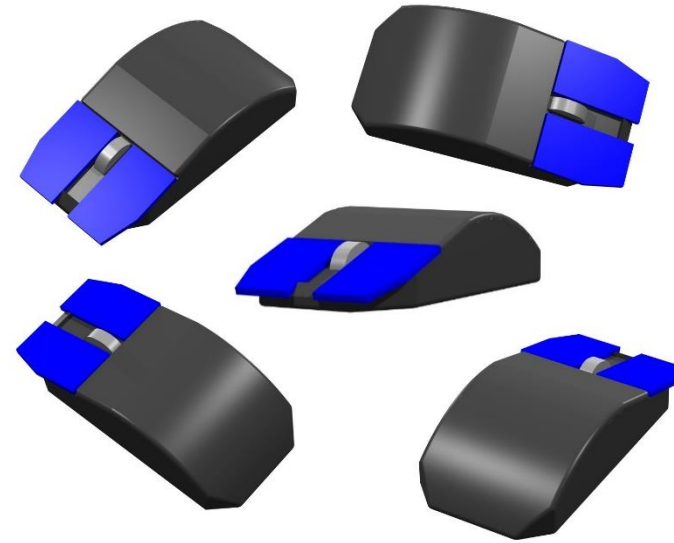


First Foam Model

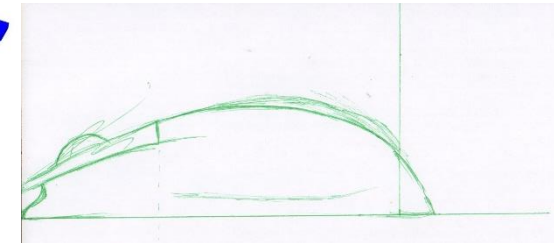
This is the first model in development. By making this model I was able to physically interact with it, this made me see that the model was too small in length and width, this caused the lower palm to hang off the edge and put the hand in an uncomfortable right angle. This would cause serious RSI which could lead to long term problems with the hand, arm and possibly back. The buttons are nice and big, meaning you won't have to worry about missing them when in game, and the scroll wheel is in a good place, as it sits comfortably between the two buttons. The scroll wheel, however, needs to be bigger so it is easier to access. The two smaller buttons would not be situated on the ends of the buttons because it will cause the left/right button to be pressed accidentally, which could be bad in a game.



Pro-Desktop (CAD)

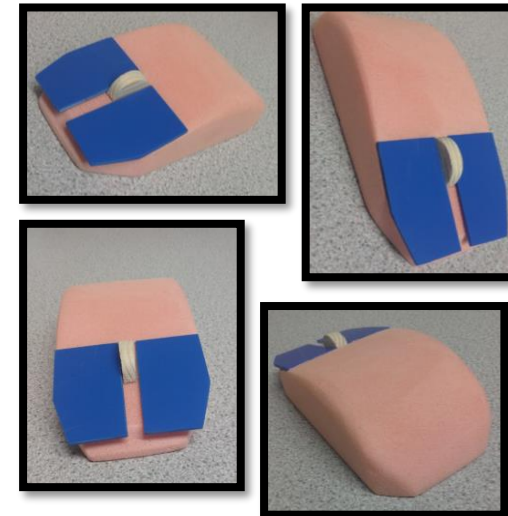


The CAD designs show how I will be developing my original mouse so it is more ergonomic and better. The buttons are bigger, as is the scroll wheel, and they even overhang the mouse itself to give the edge look. The length has been made longer to support all parts of the hand, and the arc of the mouse is further up. When I make the foam model, I will be able to see if I need to change the arc and its height, but only when I can physically hold it.



Second Foam Model

There were several things that I could change with the first model and that is shown in the second. I addressed the issue of the mouse being too short, and lengthen it with a slope that curves down to the whole hand has support. However when doing this, I found the mouse was too big, and the hand felt like it was slipping off the end of the mouse, so to further improve this, I will be keeping the sloped end but make the whole mouse shorter. I also removed the extra buttons on the ends of the left and right click. I will be re-adding them in the next model, but in different places. The overall shape has been rounded off more, to see how it compares to the first model, I would personally say that it needs the edges to give it the retro look; which is what I want to achieve.

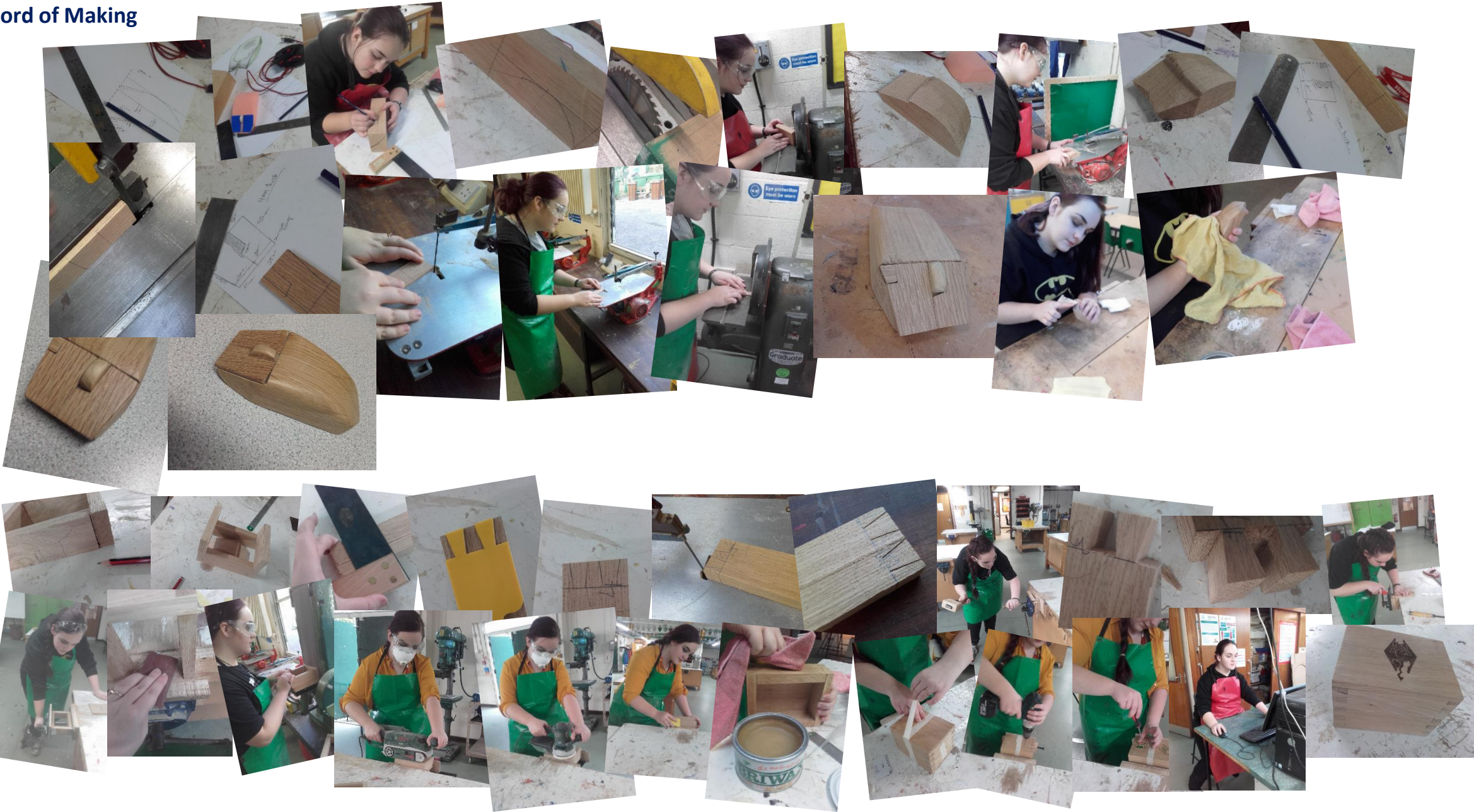


Production Plan

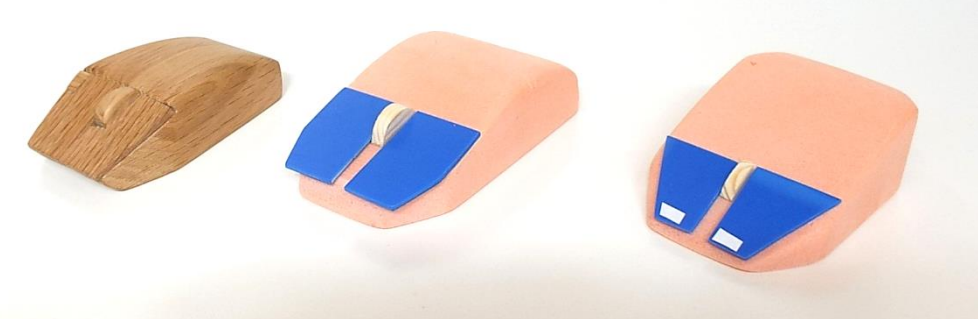
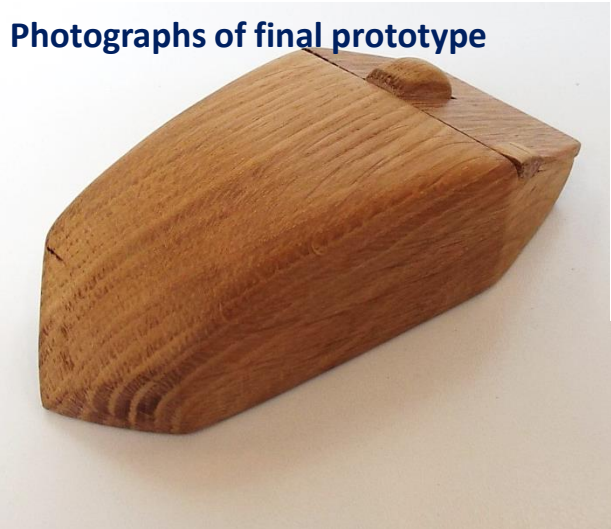
Stages	Minutes	Task	Tools and Equipment	Health and Safety Issues	Quality Control Check
1	20	I will use CAD to design my mouse, and even though I have an idea as to how it will look, I will take into consideration what people have said that they want in a mouse. By using CAD, this insures that all my measurements are correct and this can clearly be seen.	Computer with the 2D Design program	No liquid substances should be near the computer in case of a spillage which could cause the computer to malfunction or even cause a fire if spilt on the plug. If on the computer a large amount of time, there is the possibility of RSI so there should be a break in the middle. When using the computers, make sure to be in a well lit room, a good distance away from the screen, the brightness and contrast of the computer should be adjusted for comfort and will lessen the effect of eye strain.	Double check that the measurements are correct. Make sure that the design looks aesthetically pleasing. Make any modifications if needed.
2	10	After I've finished designing the mouse, I will be doing measurement correct drawings of the mouse on to paper. I will then use these to transfer on to the block of oak, by copying them exactly.	Paper Pencil Rule Tri-square	When not using any of the tools, leave them in the centre of the table to prevent them from falling and either becoming a trip hazard or a fall hazard.	Make sure sketches are the right measurement and are clear.
3	5	The basic shape of the mouse needs to be cut out before any detail can be added. I will make sure there are guide lines when cutting.	Circular saw (Panel saw)	Because this is a dangerous piece of equipment and requires a licence, my teacher had to do this for me. Goggles were worn and hands were kept away from the saw at all times when in use.	By taking time, make sure all cuts are straight and precise.
4	10	I will be left with a square block that needs to be curved and shaped, to do this I will be using the power sander. This will give me the curves I want in a short space of time.	Power sander Goggles	When using the power sander, I must take precautions and wear goggles. Hair must be tied back and hands must be a safe distance from the sanding pad.	By taking time when sanding. I will be able to get even curves and edges. If I try to rush, I could end up with uneven and too big curves. This will massively effect the way the mouse looks and feels.
5	10	When I have the basic shape of the mouse I need to cut two triangles off the front of the mouse to give it the edgy retro look, by using sharp edges and curves.	Jigsaw	The jigsaw has a fast moving blade that could cut through skin, fingers must be kept away and goggles must be worn, because the thin blade could snap if under too much pressure.	Take time when cutting, and follow lines where appropriate. If there are any issues and not enough is cut away, it can be sanded down further.
6	30	The final shape will need to be made, and I will do this by hand sanding the whole thing using P80 and P240 sanding paper.	P80 sanding paper P240 sanding paper	When using the paper do get fingers in the way, as this could hurt and cause injury. If using the vice to hold the mouse, be careful not to trap fingers.	When sanding, make sure all sides are even, and don't do any sanding that isn't needed.
7	10	When the body of the mouse is finished, the buttons and features need to be made and added. I will need to draw out the buttons, with correct measurements, where I will then transfer onto oak.	Paper Pencil Rule Tri-square	When not using any of the tools, leave them in the centre of the table to prevent them from falling and either becoming a trip hazard or a fall hazard.	Make sure sketches are the right measurement and are clear.
8	10	After drawing out the buttons, scroll wheel etc. the need to be cut out. For this I will be using the jigsaw.	Jigsaw	Because the buttons are so small, I need to think about how I will be cutting them to ensure my fingers stay as far away from the blade as possible. Goggles need to be worn with hair tied up, and any loose clothing kept away.	Follow the lines exactly as they need to be symmetrical and straight. Care must be taken, and there can be no distractions when using the saw.
9	15	To finish the buttons they need to be sanded. For this I will be using the power sander to make sure it is straight and even. Sanding paper may also be needed to tidy the edges of the buttons and get an arch on the scroll wheel.	Power sander P80 and P240 paper Vice	Again, because the buttons are small I must be careful not to touch the disk as this could cause an injury. Loose hair and clothing needs to be tied back and kept away from the sander. Make sure to not trap fingers in the vice.	The sanding is only going to be used to make there edges straight, do not do too much with the sander as this could cause more problems. If the buttons are hard to hold, use a vice to keep them secure.

Stages	Minutes	Task	Tools and Equipment	Health and Safety Issues	Quality Control Check
8	10	After drawing out the buttons, scroll wheel etc. the need to be cut out. For this I will be using the jigsaw.	Jigsaw	Because the buttons are so small, I need to think about how I will be cutting them to ensure my fingers stay as far away from the blade as possible. Goggles need to be worn with hair tied up, and any loose clothing kept away.	Follow the lines exactly as they need to be symmetrical and straight. Care must be taken, and there can be no distractions when using the saw.
9	10	To finish the buttons they need to be sanded. For this I will be using the power sander to make sure it is straight and even. Sanding paper may also be needed to tidy the edges of the buttons and get an arch on the scroll wheel.	Power sander P80 and P240 paper Vice	Again, because the buttons are small I must be careful not to touch the disk as this could cause an injury. Loose hair and clothing needs to be tied back and kept away from the sander. Make sure to not trap fingers in the vice.	The sanding is only going to be used to make there edges straight, do not do too much with the sander as this could cause more problems. If the buttons are hard to hold, use a vice to keep them secure.
10	5	The basic shape of the mouse needs to be cut out before any detail can be added. I will make sure there are guide lines when cutting.	Circular saw (Panel saw)	Because this is a dangerous piece of equipment and requires a licence, my teacher had to do this for me. Goggles were worn and hands were kept away from the saw at all times when in use.	By taking time, make sure all cuts are straight and precise.
11	10	I will be left with a square block that needs to be curved and shaped, to do this I will be using the power sander. This will give me the curves I want in a short space of time.	Power sander Goggles	When using the power sander, I must take precautions and wear goggles. Hair must be tied back and hands must be a safe distance from the sanding pad.	By taking time when sanding. I will be able to get even curves and edges. If I try to rush, I could end up with uneven and too big curves. This will massively effect the way the mouse looks and feels.
12	10	When I have the basic shape of the mouse I need to cut two triangles off the front of the mouse to give it the edgy retro look, by using sharp edges and curves.	Jigsaw	The jigsaw has a fast moving blade that could cut through skin, fingers must be kept away and goggles must be worn, because the thin blade could snap if under too much pressure.	Take time when cutting, and follow lines where appropriate. If there are any issues and not enough is cut away, it can be sanded down further.
13	30	The final shape will need to be made, and I will do this by hand sanding the whole thing using P80 and P240 sanding paper.	P80 sanding paper P240 sanding paper	When using the paper do get fingers in the way, as this could hurt and cause injury. If using the vice to hold the mouse, be careful not to trap fingers.	When sanding, make sure all sides are even, and don't do any sanding that isn't needed.
14	10	When the body of the mouse is finished, the buttons and features need to be made and added. I will need to draw out the buttons, with correct measurements, where I will then transfer onto oak.	Paper Pencil Rule Tri-square	When not using any of the tools, leave them in the centre of the table to prevent them from falling and either becoming a trip hazard or a fall hazard.	Make sure sketches are the right measurement and are clear.

Record of Making



Photographs of final prototype



Photographs of final prototype



Evaluation Against the Product Specification

Introduction

I have been asked by R.A.T Mouse to design a computer mouse that is fit for some one who is an avid gamer, and spends typically a long time on their computer gaming. This mouse needs to be comfortable, fit perfectly into the hand of anyone and needs all the functions that might be needed when playing any game.

Function

I am aiming to make a high **quality** and **aesthetically** pleasing gaming mouse, that is targeted at the teen/young adult age range; since this is the average age for the more intense gamers. There is a huge market when it comes to the computer mouse, because of the advancement of technology. More people these days also have the time and the funds to afford good gaming equipment, however with people gaming more and more hand injuries are becoming more common, like **Carpal Tunnel Syndrome** and **RSI (Repetitive Strain Injury)**. This effects people who game a lot and have their hands in **unnatural** positions, this puts great strain on the nerves in the hand and can cause great pain. Computer mice have been made in order to prevent/lessen these effects however there is still **improvement** to be made. By making mice more comfortable, whether that’s making them into a more **ergonomic shape**, or making them able to personalise to the shape of the consumers hand. The effects of **extensive** gaming can be **minimized**. Today’s mice are pretty much always **wireless**, thus means that it must have some sort of battery pack and must be able to charge, by being wireless I will achieve greater **customer satisfaction** however when I was researching the different computer mice on the market, a lot of the high end mice were wired. This would be because USB mice will eventually run out of charge, and a gamer will not want their mouse dying in the middle of a game. People who will buy this product will be using it a lot, so there needs to be a **high quality**, no one will want it if the buttons or features are “sticky”, making it potentially a bad product, and will not appeal to the market that I am targeting; since they will be using it a lot it needs to last. If people play games that require rapid fire or lots of buttons to do features within the game, they won’t be using an everyday mouse with only the three basic functions (left and right click and a scroll wheel), it would be like if you played Super Mario with a joystick, that wont work. I’m also going to make the mouse have an identity, a brand/logo that people can clearly see and will link that brand to quality and comfort, if someone saw the R.A.T logo on a mouse they will connect it with quality and the latest in technology.

Function:

My design is truly inspired to be for the gaming market and has the key features needed for modern gaming. It has the normal left click right click and scroll wheel it also has the DPI setting and could be adjusted and weighted differently for the personalisation of the user. It is wireless since that I what the consumer wants but there should be the option for either wired or wireless which would satisfy 100% of the consumers. There also the new technology that came out a in November, for a mouse that charges as you use it if you use it on the pad that it comes with. I believe that it is done through kinetic energy. I would like to interoperate it in a further design. When asking my target market what they would improve they said that they would want a few more buttons that could be programmed to do what they want. By using oak the mouse is high quality and is very durable so it will last a long time. I’m very happy with the shape it is because it is very comfortable to hold and the target market agreed with me, they said that its very ergonomical and they think they could hold it for a long time. This will stop the effect of RSI which is what I wanted from my mouse.

Safety

When using machinery and hand tools, it is vitally important to be safe about it. An apron should be worn to protect clothing from paints, glues and any lose fabric from getting caught in the machinery. Long hair should be tied back and goggles must always be worn and in some cases ear defenders. Take notice of the safety signs near the equipment and always listen to the teacher. Some laws may stop me from using certain things (like brand saw) and if I need to use them I will ask the teacher to do so. At no point will I use equipment unsupervised. The product must also be safe. No toxic paints will be used for the product because this will make it unsafe and will be against the EU safety standards, making it illegal. It is important, when manufacturing that a product is made as safe as possible.

Materials

The normal mouse these days is made from some sort of plastic. The lower priced ones will most likely be made from Nylon. Nylon is a good material because it is machine-able, durable, a poor conductor (so if there was any chance of an electrical shock the person holding the mouse won’t be shocked). If the product was very cheap, the nylon probably wouldn’t be very pure; meaning it has probably been mixed with fillers to body out the plastic. This makes the plastic cost effective, but also brittle and highly likely to snap or break. Higher price mice are likely to be made from **ABS**. **ABS** is a high **quality** plastic that is also used for car steering wheels and electronic casing, it is a **heat** and **chemical resistant** material with a **high strength to weight ratio**, this makes it perfect for a mouse because it won’t be affected by the sweat produced by someone’s hand and will be possible to be made thin but still strong, due to the **high strength to weight ratio**. Another material that could be used is wood, like **oak** or **ash**, they are both materials that are **aesthetically** pleasing and have a good **strength to weight ratio** because they are both **hard woods**. ABS or Polycarbonate would be the two ideal plastics, and Oak, Ash and Beech will be the ideal woods. In my actual product I don’t have access to these materials due to school budget however I can make it out of MDF. Air drying clay, foam, pine or oak. When making the box I can adhere to oak because it’s highly available in the work shop, the tools and machinery to manipulate the wood. Can achieve high quality and aesthetically pleasing design that is modern and suitable for the material that will be used. It could be used for an actual product as well as my project. The mouse could be made from MDF because it is a good material to use on the laser cutter, it can be painted and finished to achieve a plastic like effect, by spraying it with a clear lacquer. HIPS could be vacuum formed to produce curvature and radius. Acrylic, again like MDF, can be laser cut and line bended. Prototypes can be made from foam, air dry clay, paper and card because these are all cost effective materials that are easy to shape and manipulate and take a very short amount of time. Having 3D prototypes help you to interact with them and get a sense of what the real thing will be like. It could help with ways to shape the actual product and if it isn’t right, you can easily change or even start another one without a high cost factor.

Aesthetics: The material used (oak) made the mouse have a very appealing quality to it, the grain curved with the mouse which made it flow. The use of curves and wood gave a very natural and clean feel to it. I didn’t want to make a standard mouse that looks like all the other ones on the market, I wanted it to be unique, modern and follow trends; which I feel I have achieved. My target market agreed. I could have used plastic like ABS or HDPE for it but lots of technology is made with plastics, and by using wood it makes it look different and also opens up the market to people who like to have new and different objects. The wood has also been finished with Bee’s Wax giving it a glossy finish to make it feel more high quality.

Aesthetics

In modern day society, trends come in and out. The modern style today would be sleek matt black or gun grey metals, a lot of people decorate their houses like this, and like to own products that follow this style. Plastics like ABS, Epoxy Resins and Poly Carbonate can all be made to have this sleek matt finish, making them aesthetically pleasing since they can all be pigmented and given a finish. Another tend that is coming back would be the wood effect. A lot of products today are going back to the old style materials but with the sleek of modern day. An example would be the new Atari gaming console, it looks like it would fit in perfectly with the 1970 because it has the wood finish, but it is also very sleek and modern. My mouse could be made with a wood effect, especially with different coloured woods. I will be experimenting with the different styles and finishes I can get on both the plastics and woods.

Sustainability

The environment must be kept into consideration when making something. The materials used for the prototype should be as environmentally friendly as possible, and so should the materials used to make the real product. An example of this would be to use soft wood rather than hard wood for the prototype, because soft wood is more sustainable than hard wood due to the shorter amount of time to grow, forests can be replenished very quickly and managed. MDF and plywood are also sustainable because they are man made boards that are made of soft wood that has been recycled; making them good for prototypes because they are cost effective and abundant. Acrylic is less friendly to the environment because its had to go through vast amount of manufacturing and is made form crude oil (which is a non-renewable source), this causes harmful emissions into the air like CO2. I could used recycled acrylic however this has the same impact, due to the usage of machinery to make it. Thermoplastic could easily be reshaped/recycled making it quite friendly to the environment. Metals, like mild steel, on the other hand will not be very friendly because of the excessive amounts of fossil fuels burnt in the process of making and recycling it. Ultimately wood will be the more sustainable option over plastics, since wood is renewable and plastics are finite.

Potential materials I could use that are renewable are: Oak, Pine, Card and Paper, each of these materials come from trees, which went cut down can be replanted, meaning that we shouldn’t run out. Card and paper can also be recycled. Non renewable Styrofoam and clay are not renewable because, Styrofoam is a plastic and requires oil, oil is a finite material which will eventually run out. Clay is also a finite material and although there is a lot of clay it will eventually run out. MDF and Plywood are both renewable and non because they are made out of recycled wood but it needs adhesive to be made which is made from oil.

Sustainability:

My mouse would be very sustainable if it were put into production because it is made from wood. Wood is a sustainable material because there isn’t a finite source of it, because trees can be replanted and replaced. This means that we should never run out of wood. If I were to use a high quality plastic like ABS I would have been using a significant amount of crude oil, and the problem with oil is that it is finite which means we will eventually run out if it is being costumed at the high rate it is now. The other big difference is the production of wood verse oil, wood needs a lot less oil in the manufacture compared to the oil and it needs to be transported less because a lot of countries have their own sustainable wood farms where as oil comes from a few select areas. The problem with using the wood is it can’t be recycled and still be aesthetically pleasing where as the oil can.

Ergonomics:

Before I started this project I knew that I wanted an ergonomic mouse which could be held for a long amount of time, which meant that it needed to be comfortable to hold, and fit to the shape of the hand. I curved the mouse so it followed the arch of the palm and tapered it off at the end to support the wrist. I made sure the buttons were in close proximity of each other meaning that fingers don’t be strained in order to reach them, this will all reduce the probability of RSI. Using the results from measuring people’s hands, I was able to work out what a comfortable size would be. To further the ergonomics of my mouse, I would create a place for the thumb to sit making the hand sit in a natural position.

Materials:

Oak was the main material I used because it is very aesthetically pleasing and follows current trend. Oak has a high strength to weight ratio meaning it is durable lasting a long time. It didn’t need any painting or treating it only needed bee’s wax polish to finish it. With other woods or plastics they could require more treatment which would make the cost of the final product more. It was also easy to manufacture, power sanders worked really well and no big machinery was needed which use a lot of electricity, burning more oil and creating more CO2. My target market liked the idea of using wood because it’s unique and they haven’t seen it before.

Manufacture:

The wood was really nice to work with and while making the mouse and the box, I used all of the listed tools.

Manufacture

While I’m creating my ergonomic gaming mouse I will be using a wide range of hand tools and machinery, however depending on which materials I use and what part of the mouse I will be making will depend on what machines I use. Some of these may include:

- Sanding block
- Steel rule
- Bench vice
- Bench hook
- Tension saw
- Coping saw
- Mitre saw

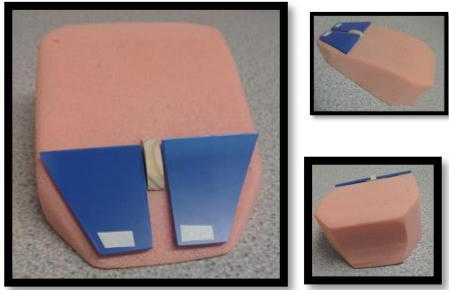
And there are also the automated tools:

- Computer
- Printer
- Jigsaw
- Scroll saw
- Band saw

Ergonomics

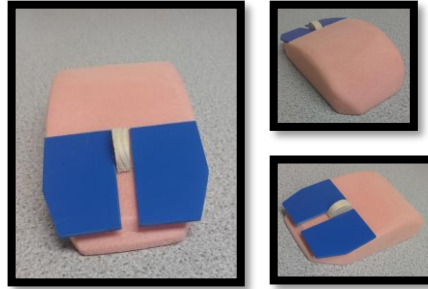
This is the study of people and how they **interact** with the world around them in their every day lives. It is how products are made to fit the **customers needs**. By taking things like size and weight into consideration I can create a mouse that is ergonomic for the target market, I did some primary research for this data by measuring 40 peoples hands (20 male and 20 female). This helped me to understand how big the mouse should be in order for maximum comfort and the mouse must be shaped to fit the hands natural curves. To make sure the mouse fits the hand of the consumer it will be changeable, there will be features to adjust the length and the width.

Target Market Feedback from Development Stage



Solutions: a longer body. A more sloped back to support the wrist. Removed the extra buttons to stop interference.

Room for improvement: the mouse was way too small to comfortably fit in to the hand, causing strain and sweating, which after a long time would make the hand and wrist hurt. The back of the mouse is too high, making the wrist bend downwards, which could lead to RSI. The extra buttons are located on the ends of the left and right click meaning you click the smaller buttons and the bigger ones at the same time, which would cause problems when using the mouse.



Solutions: made the body slightly shorter. The shape of the mouse fits into the hand. Made buttons into different shape, and fit to each other, making it look more fluid.

Room for improvement: the body is now too long, making it feel like your hand is slipping off, which again causes strain and tension. The mouse is too blocky and needs to shape to the hand. Missing the extra buttons that control DPI and lighting, most gaming mouse have these now and is a requirement. The DPI also means that the mouse can be used for office work so it makes the mouse more versatile. Aesthetically isn't very nice looking.



Room for improvement: in order for maximum comfort there should be a support for the thumb and little finger. Personally I think it should be wired and not wireless, it excludes the possibility of the mouse running out of charge while being used. I am very happy with how it turned out and I will go on to make further improvements.



Freddy's comment on this stage of development: the mouse is far too small for my hand, so I have to force my hand into an uncomfortable position, my wrist is also at a bad angle which hurts even when using it for the short time is was holding it. It looks very retro which is good but doesn't fit with the current trends of today, it needs to be more sleek and sophisticated.



Muge's comment on this stage of development: I have small hands, and I struggle to keep them on the mouse, it feels as though they are slipping off. If you made the body shorter and the slope less steeper it would be more comfortable. The buttons are nice and big making them easy to use, which would be good when gaming because you can place your hand in the position you want and still touch all the buttons.



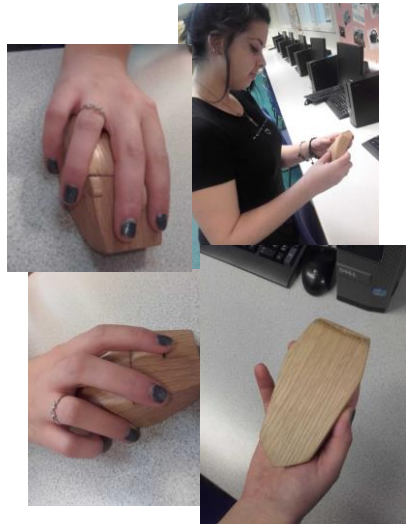
Amy's comment on this stage of development: I really love the fact its made of wood, it looks really nice and modern. The shape is really comfortable and easy to hold. It does need a section for my thumb to sit, especially if I'm going to be using it for a long time.

Target Market Feedback on Final Idea



Lottie: the shape of the mouse almost looks like a concept car, its very stream lined and makes it look smooth and fluid. The way the grain goes makes the mouse look very smooth, the way its been treated and shaped shows off the natural beauty of the oak; making it very aesthetically pleasing. The overall shape and size complements the contour of the hand when using it. The overall design is very contemporary and modern, which will help to make it sell. I personally don't like the wireless feature, because I wouldn't want my mouse to die in the middle of a game, so I would want the option to go wireless or wired.

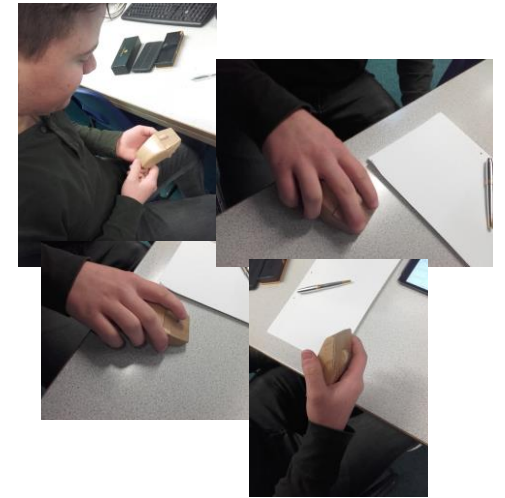
Muge: I live the fact that its wooden, it makes it unique and I've never seen anything like it before on the market. The shape and material makes it look very retro and even though it has edges and points it looks very curved, it isn't sharp. It fits into the current trend of using wood and would fit in with any home/office. Its versatile so can be used as a gaming mouse or an office mouse, due to the DPI changing feature. I like my mice to be wireless because when I'm transporting them I hate it when the wires get tangled. Its really nice, but I feel like it needs a few more features in order to be a successful gaming mouse, especially online shooter games like Counter Strike; I which I play. More programmable buttons would be what makes the mouse perfect.



Freddy: I really like the way it fits into my palm, its sleek angular lines mean that it compliments the shape of my hand. The tapering off at the back means it curves the bottom of the palm back down towards the table, where it can rest comfortably on the surface. It's a nice weight, its heavy enough to feel robust and durable, but not too heavy that it could cause strain. I'd want to have a button near the thumb which I could program just to add that extra feature and make it better for gaming; because some games will acquire extra buttons and it broadens the market. Another good idea would be to have a thumb rest, this will further the comfort.



Amy: using Oak as the material is a lovely idea, it makes it look very modern and unique. The wireless feature means that it is likely to last longer, because I don't have to worry about the wire breaking and then the mouse not working at all. I have small hands and usually find that gaming mice are too big, but with this one it isn't. it is comfortable to hold and is the right length and width to fit comfortably in the palm of my hand. I feel like it could use this mouse when gaming for long periods of time. I would like to see it have some sort of rest for my thumb and small finger since they don't have anywhere to sit. I would also like there to be more buttons so the mouse can perform other tasks like rapid fire, which is used in many games.



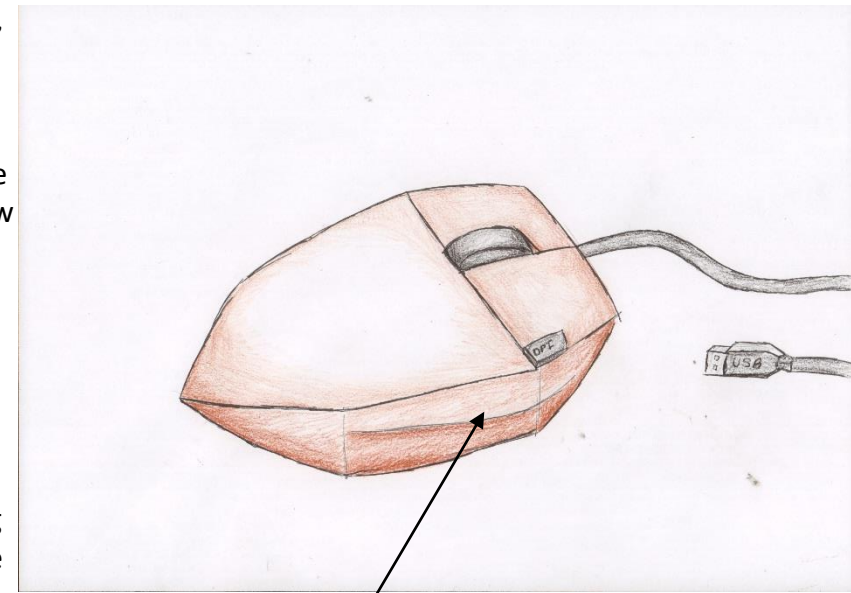
Modification of final idea

I have listened to what my users have said and I have kept the shape and the size since it fit comfortably into the hand of everyone that held it. They all said that the mouse was comfortable and that they feel like they could hold it for a long time.

I was told that the mouse would be better with more programmable buttons that some modern games will require. So I have taken inspiration from one of the mice I looked at on my comparison page, and place three buttons in an easy to access place, where the thumb will be. Because I have positioned them here, there is no strain needed in order to reach them, and there is quick access ability for fast and precise use; which can be important in online gaming.

By adding the thumb rest and the curve for the little finger, the hand sits in a more natural position meaning there is less likely the chance of RSI (Repetitive Strain Injury) and will make gaming in the long run more comfortable. It also means that the thumb doesn't have to drag along the table as the mouse is in use. I've also added a wire because a few people said that they wanted a wired mouse, however the wire can be removed and become a wireless mouse, so people can choose whether they want it wired or wireless, this does mean it needs a long lasting battery, some of the longer lasting mice can be used for nine weeks before running out of charge.

I have kept the same materials, since the wood made it unique and my market liked the different aspect of it being made from Oak. It doesn't follow the same modern mouse trend of being made from plastic, but it does follow the modern movement of having more wooden items in the home.



Curved for the little finger

Wired or wireless

More programmable buttons

Thumb rest

Muge said that the final modification is really good because it looks at the maximum comfort for the hand, with also having all the functions that a modern gaming mouse may need, and more. Freddy liked the idea of the mouse being wired and wireless, it means you could leave it on a desktop at home, but could also take it out with you for the laptop.

Lottie found that having more programmable buttons would give you the upper hand while gaming, it makes actions fast and easy to achieve during games.

Amy said the use of wood really makes it stand out from the rest of the market and with the features will make it desirable to the market, but will also expand the market to people who want unique and different items.

