

Stage 2 Design and Technology - Material Products
Assessment Type 3: Folio
Timber and Timber Products
Student Response

Brief

I would like to become a part time musician, I have become interested with learning the guitar after knowing that my dad has been playing the guitar since he was my age has inspired me to build my own guitar and learn to play. This guitar will be big enough to last till I'm older as I will not grow much more whilst that being said it will need to be designed and built properly to last till I'm older.

Essential criteria

To require the acoustic sound you have to have the essential criteria. To solve my design debrief problem and becoming a part time musician I need to have the correct materials and size the size required is a 000 and made to shape and proportion in order for it to be played properly and comfortably. As being a beginner the guitar will just have the regular 6 strings to make it easier to learn and play on.

Desirable criteria

To have my guitar as perfect as possible I will need to have to desirable criteria; have a cut away shape to play the lower cords easier, putting an amplify pick up in my guitar so that I have the option for plugging it in to an amp and have an eye catching head.

My guitar will be built out of quality, long-lasting and durable material so that hopefully in the future I won't have to make or buy one. The desired result for my guitar would be a dark bottom and sides with a cream top with grain marks visible on all sides. The dark and the cream will be broken up by a light coloured binding. To make this guitar consideration must be made like practicality, cost and environmental factors.

Investigating (I1)
Considered identification of a need, problem, or challenge.

Constraints and considerations

I have only three terms to complete my guitar and the first term will be used up for the planning and design, whilst also having to complete a skills task and other minor investigation such as the materials and adhesives investigation. With a busy schedule I need to plan when my wood delivery for my guitar comes carefully, as I do not want to waste time waiting for it. I also need to plan how I use my lessons and study time so that I can complete my project within the time schedule.

Cost

Having a great sounding acoustic guitar means having the correct materials; although they come at a cost I was funded by my parents who were willing to pay all expenses. However I did not want to put to bigger dent in their pockets and searched around the web looking for a cheap but also 'A' grade quality material and as most of my class mates were building guitars also, we managed to get a bulk discount.

School/transport

The school has a great workshop facility, for all types of projects. Especially for guitars as previous students have made them with jigs and routers already in the workshop also having a teacher who has already helped students with their guitars in previous years knows where you can go wrong and can point you in the right direction. Transport isn't a problem as you can fit a guitar in any car.

User

The user of the guitar would be my father and me, my father has many years' experience with playing guitar as he has been in many bands. I will need to make it comfortable to play so choosing the right size is faultless, being both medium builds with both require the guitar to be not too big and not too small. This issue will be brought up when the designing my guitar.

Ergonomics, aesthetics and Anthropometrics

Appearance of the guitar is almost everything besides how it functions. Although everyone has their different opinions on what they think a good looking guitar is, although mine is a dark back with dark sides and a cream coloured front with grains running through it. I want the function of my guitar to be as best as possible and by getting all the best possible equipment and wood I have given my guitar the best possible chance to be almost perfect in every way with the designed based around my body size and that I'm a beginner. To ensure that the guitar is fitted to my size you have to look at the length of the body and the neck to ensure that it is to my fitting, by making sure that I can reach every fret on the neck and have a comfortable shape to lean on.

Material options

To have the best aesthetics you have to have the best looking material along with the best quality. The quality of wood depends on how it sounds been playing and how it holds up in the long run. Below are some examples of the types of wood I could to choose from.

Sitka Spruce

The standard tone wood for the modern era is Sitka spruce. The combination of the strength and elasticity in the wood gives it a broad range, soft crisp articulation and allows both aggressive strumming and fingerpicking.



Rosewood

Rosewood is one of the most popular and traditional woods to be used for guitars. Rosewood has a deep sound in the low end and brighter on the top end. It is said that rosewood is a great sound because everyone knows the sound. Rosewood's history has helped firmly establish its acoustic legacy. It also is a versatile wood, meaning it can be fingerpicked strummed and flat picked.



Cedar

Cedar has a warm balanced sound and is a popular wood, because it has a fast response to people who play lighter tunes, and has a quickness of sound that tops any of the spruces woods. Cedar can range from a light honey brown to a chocolate dark brown colour.



Mahogany

Mahogany has been used since the early 1920's and is a popular hardwood choice. Mahogany has a hard tough-solid sound which has been known to suit the country style of music.



Maple

There are many type of maple predominantly it has a low velocity in sound dew to the damping that occurs. The visual look of maple tends to be a light colour with waves in the grains. To bring out the best in the maple made guitar is to amplifying it to bring out that flat sounding velocity.



Investigating (I4)
Competent
investigation into
product material
options and
analysis for
product use.

Product	Likes	Dislikes	Tick of approval
Four images of guitars removed due to copyright.	<ul style="list-style-type: none"> . visible grain . good body shape . black sides 	<ul style="list-style-type: none"> . has a pick guard . don't like the look of the neck . boring head 	
	<ul style="list-style-type: none"> . the fretboard design . the shape of the guitar . the pointy shoulder of the guitar 	<ul style="list-style-type: none"> . the color and the head design . the sound hole looks to big 	
	<ul style="list-style-type: none"> . the shape of the body . and the neck and head design 	<ul style="list-style-type: none"> . has a pick guard . cannot see the grains . matching sides to the body colour 	
	<ul style="list-style-type: none"> . the black sides . the head of the guitar . can see the grains . the darker bindings 	<ul style="list-style-type: none"> . the neck of the guitar 	

Through looking at some other designs it have come to me that I am looking to design a guitar that has blacks/tan sides, lighter coloured sound board and dark bindings with a visible grain running all the way through the top. With the neck and head of the guitar I want it to be eye catching on the next page are my ideas and drawing.

Investigating (I3)
Competent investigation and analysis of the characteristics of existing products.

Environmental factors

Environmental factors when choosing your wood can make or break the type of wood that you are looking for, as there are some endangered types of wood due to the mass amount of deforestation and logging of the tree type. The most popular wood that has been used to make guitars since the 1920's is an endangered type of wood which is why it is such an expensive product. The trees are not the only things becoming endangered because of the logging and deforestation, wildlife is becoming endangered because they are losing their homes.

Coming to a decision on what types of wood to use considerations were taken such as appearance, price and accessibility and along with the environmental factors. To ensure that the price wasn't too big all the class mates decided to buy in bulk to get a discount. After all consideration were looked and studied

Neck – African Sipo mahogany

Back/side and fretboard – Indian rosewood

Top – Spruce

Investigating (15)
Some description of the impact of products or systems on the environment.

Joining methods

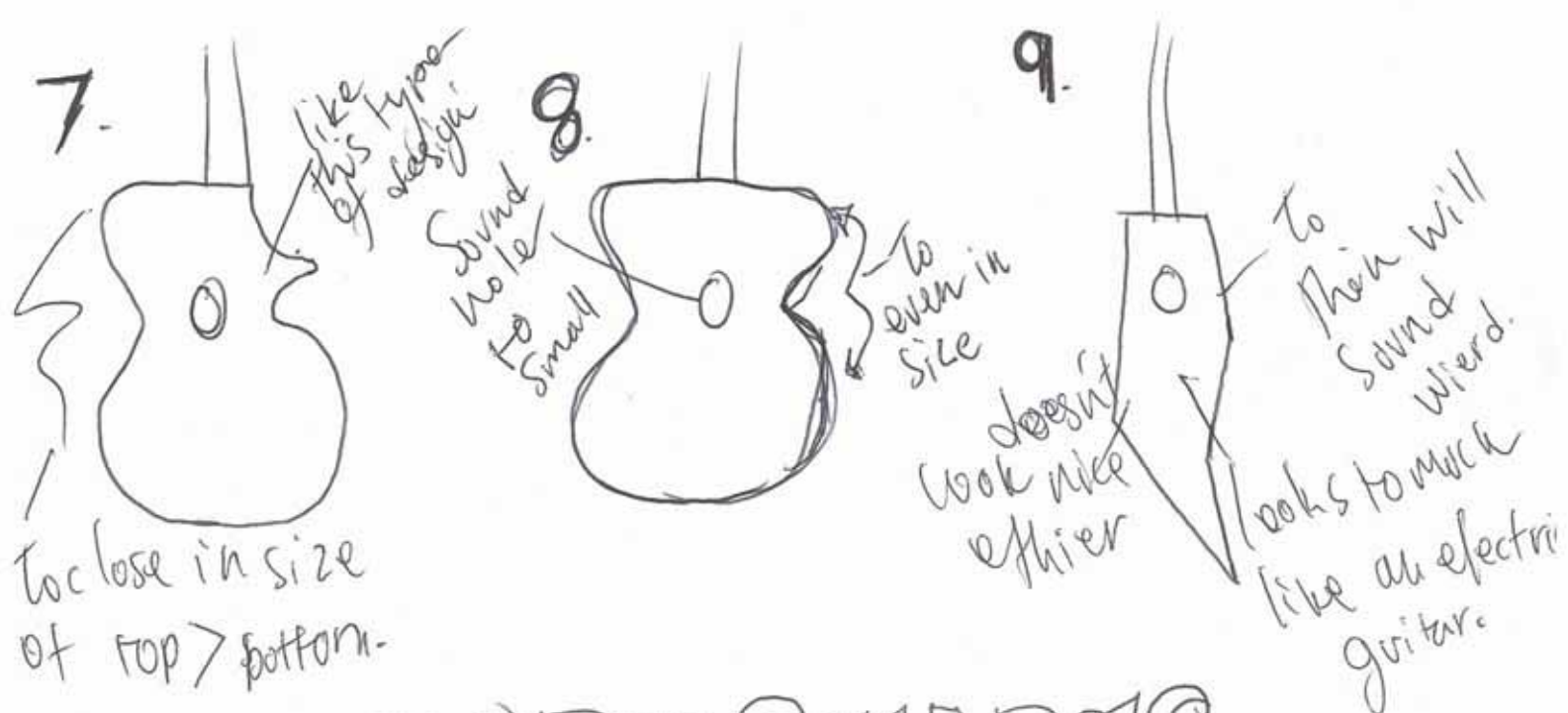
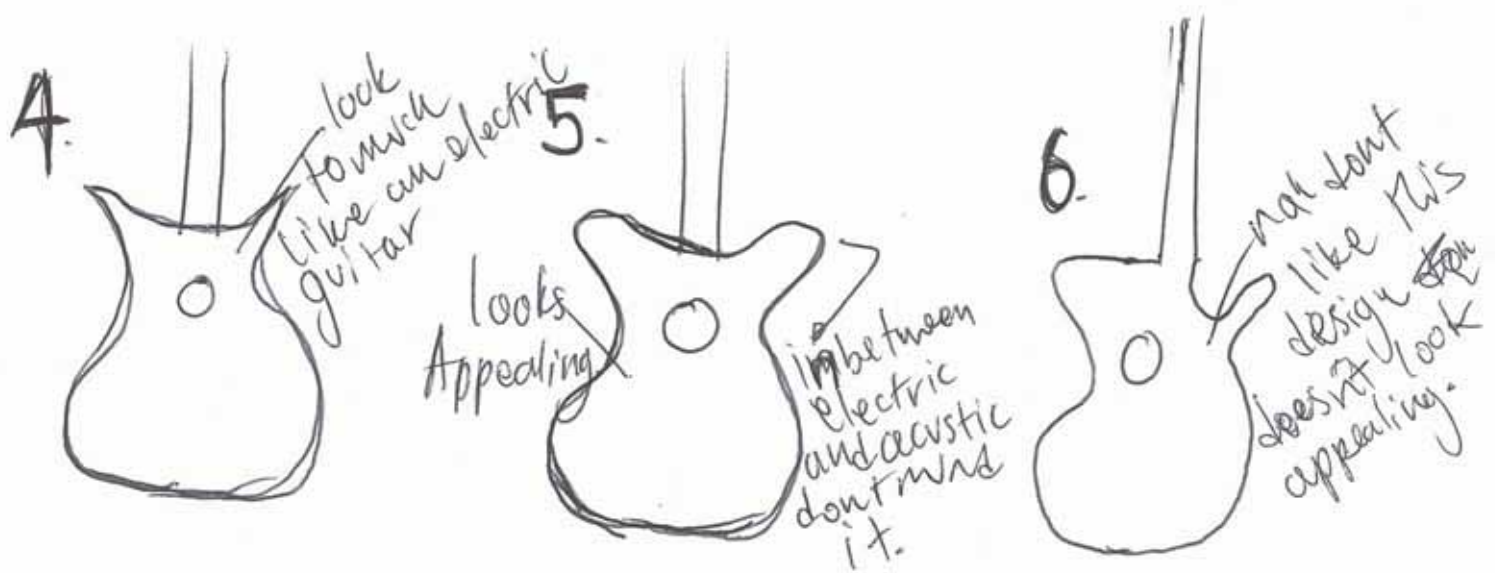
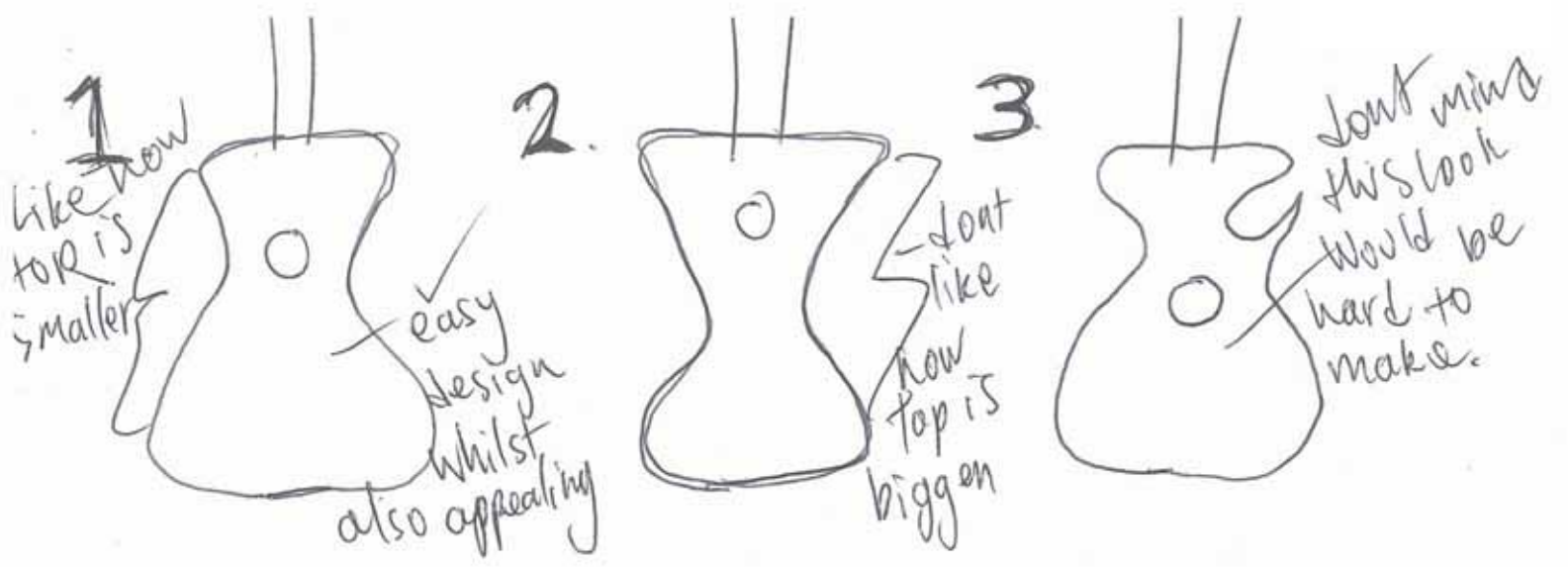
Whilst making a guitar there are some joints that have to be made, there are intricate joining methods that are used. The 2 main joints used are the butt joint and rebate joint. The reason these two joints are the 'main joints' is because they are easily accessible so if there was a problem with the guitar you could easily take it a part to fix the problem and simply put it back together.

Butt joint

Butt joints are one of the simplest forms of joints, it requires that you put two pieces of your material and butt them together. Butting is placing two pieces of material together both on their edge and by placing glue on each edge the material is held together. The negative to the type of joint is that you are totally relying in the glue to hold. The guitar is predominately made by butt joints.

Rebate joint

The rebate or trench joint is another simple joint it is done by using the router to cut one side so that the other can fit into it, the reason this is used over the butt joint is that this type of joint applies more reinforcement and is not entirely relying on the glue to hold the joint.



BODY SHAPES

CUTAWAY

1



2



3



4



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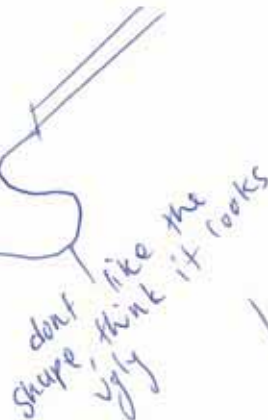
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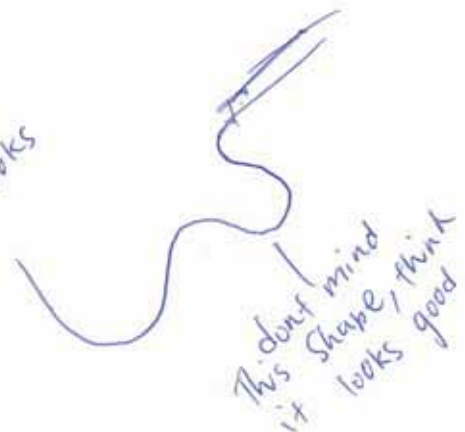
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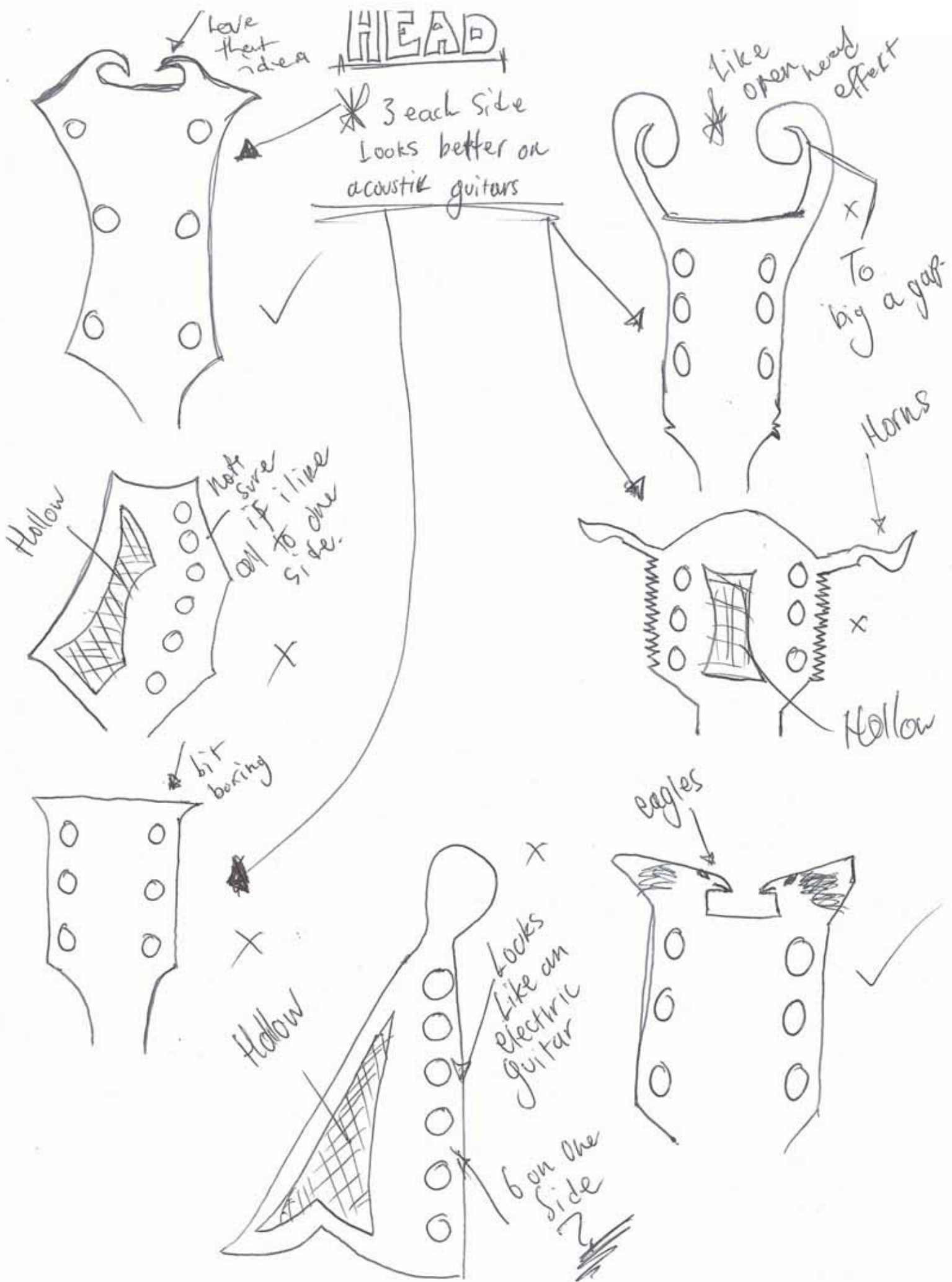
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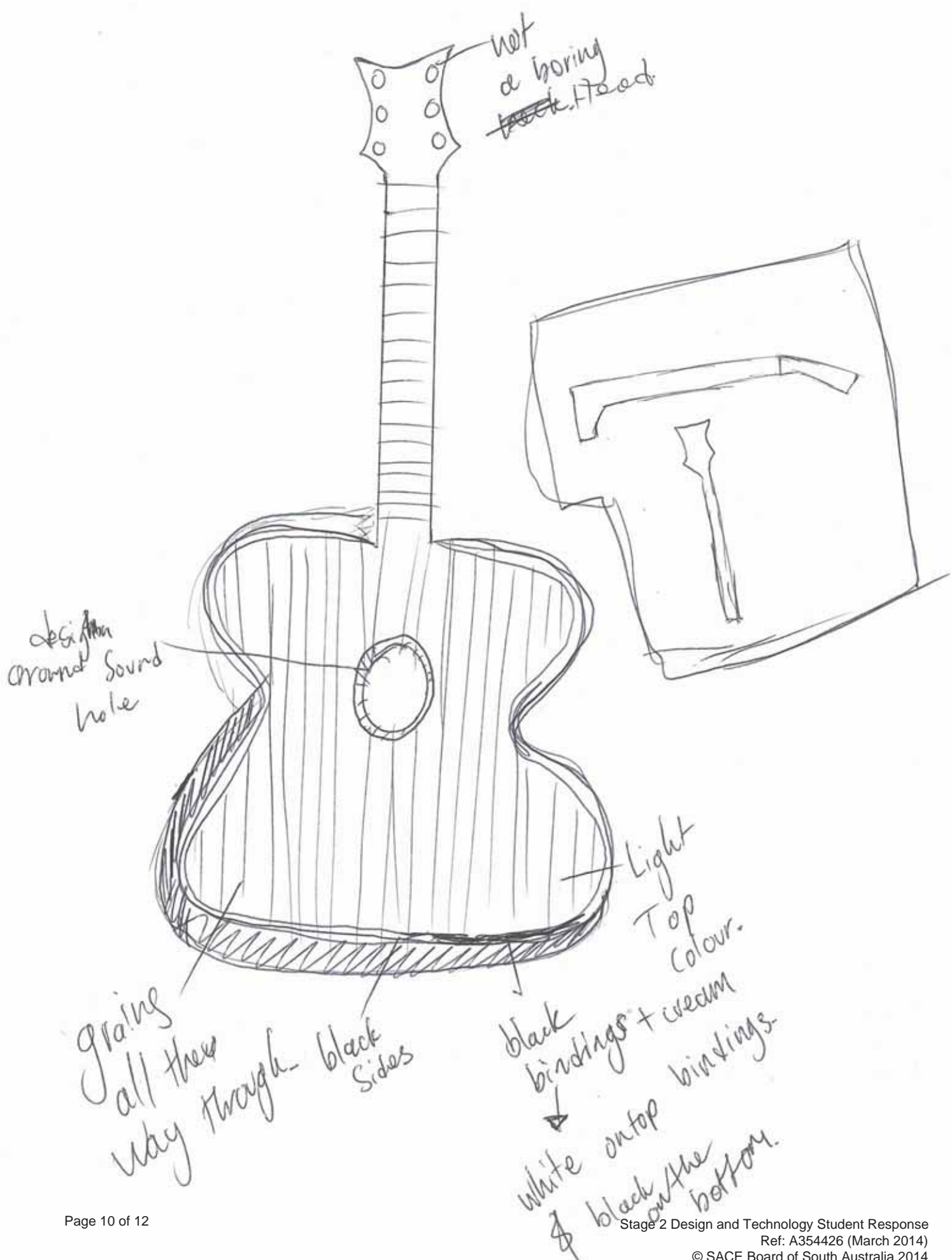
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Planning (P13)
Some modification of ideas.



FINAL



Evaluation

The assignment was assigned back in term 1 to design and construct an impeccable acoustic guitar, which needed to uphold design boundaries and the initial design brief. The design of the acoustic guitar had to be constructed into two parts the major and the minor project, the major part of my design with the body of the guitar and the minor being the neck and head of the guitar. There were criteria that had to be met when making your guitar; my guitar covered all the critical criteria being made from the best quality wood to give the guitar the best sound. The guitar has dark back and sides with a light creamy top with grains visible throughout the entire guitar. Constraints were also all met with the time, cost, athletics, anthropometrics and ergonomics to make the guitar as perfect as possible.

The making of the guitar had many issues due to other class mates making guitars meant limited access to tools and equipment. This meant that the production of the guitar was predominately based on what tools you had at hand rather than following the design timeline. This being a problem in the making of the guitar it did not affect the guitars appearance or end result. Looking at my guitar now I am happy with the choices of materials I have made as it covers my design brief of being the correct size and having plenty of grains which make the appearance of the guitar eye catching also not having a boring head. The materials were also easy to work with; routing, cutting and gluing which save time and hassle.

The guitar wouldn't stay in shape after it was glued together so to overcome this problem after using it every lesson I would then put it back in the jig to ensure that the shape would remain as perfect as possible. This was the only difficulty I had to come across when working with the material. All the other class mates were at different stages in making their guitars so when it came to a new stage you could just ask your class mate on how they think they went and what could I do better. I would make no changes to the design or materials I used.

The timbers I used and chose were based on contributing factors like the sustainability, aesthetics, environmental factors and performance. To ensure that the material I was getting was of high quality it meant the cost would be quite high, although I believe it's a good investment as the high quality material will last and hold its shape well and therefore I will not have to buy or make another guitar again.

Evaluating (E1)

Considered evaluation of product success against design brief requirements.

Evaluating (E2)

Considered evaluation of the effectiveness of the product or system realisation process.

Evaluating (E3)

Considered reflection on materials, ideas, or procedures.

Evaluating (E4)

Informed analysis of the impact of the product on individuals, society and/or the environment.

Additional Comments

This folio was assessed, on balance, as C grade.

Across the whole folio the evidence demonstrates:

- analysis of information to develop appropriate solutions to an identified design brief (PI1)
- competent communication of product design ideas, using appropriate technical language. (PI2).

Performance Standards for Stage 2 Design and Technology

	Investigating	Planning	Producing	Evaluating
A	<p>Clear, comprehensive, and well-considered identification of a need, problem, or challenge.</p> <p>Thorough and insightful creation and validation of initial design brief based on needs analysis and task identification.</p> <p>Purposeful investigation and critical analysis of the characteristics of a broad variety of existing products, processes, systems, and/or production techniques.</p> <p>In-depth investigation into product material options and focused and thorough critical analysis for product use.</p> <p>Focused and perceptive investigation into the impact of products or systems on individuals, society, and/or the environment.</p>	<p>In-depth analysis of information to develop imaginative, innovative, and enterprising solutions to an identified design brief.</p> <p>Accomplished communication of a variety of refined product design ideas, consistently using relevant technical language.</p> <p>Purposeful testing and refined modification and validation of ideas or procedures.</p>	<p>Sophisticated application of appropriate skills, processes, procedures, and techniques to create a product or system to a precise or polished standard and specification.</p> <p>Accomplished use of resources, equipment, and materials to create a product or system safely and accurately.</p> <p>Accomplished and resourceful development of solutions to technical problems that may arise during product or system realisation.</p>	<p>Insightful and well-considered evaluation of product success against design brief requirements.</p> <p>Insightful and detailed evaluation of the effectiveness of the product or system realisation process.</p> <p>Refined and well-considered reflection on materials, ideas, and procedures, with sophisticated recommendations.</p> <p>Resourceful and well-informed analysis of the impact of the product or system on individuals, society, and/or the environment.</p>
B	<p>Well-considered identification of a need, problem, or challenge.</p> <p>Well-considered creation and validation of an initial design brief based on needs analysis and task identification.</p> <p>Thoughtful investigation and analysis of the characteristics of a variety of existing products, processes, systems, and/or production techniques.</p> <p>Detailed investigation into product material options and thorough analysis for product use.</p> <p>Some depth of investigation into the impact of products or systems on individuals, society, and/or the environment.</p>	<p>Thoughtful analysis of information to develop enterprising solutions to an identified design brief.</p> <p>Capable communication of different quality product design ideas, using relevant technical language.</p> <p>Thoughtful testing, modification, and validation of ideas or procedures.</p>	<p>Capable application of appropriate skills, processes, procedures, and techniques to create a product or system to a mostly precise or polished standard and specification.</p> <p>Capable use of resources, equipment, and materials to create a product or system safely and mostly accurately.</p> <p>Thoughtful development of solutions to technical problems that may arise during product or system realisation.</p>	<p>Well-considered evaluation of product success against design brief requirements.</p> <p>Well-considered and detailed evaluation of the effectiveness of the product or system realisation process.</p> <p>Well-considered reflection on materials, ideas, and procedures, with thoughtful recommendations.</p> <p>Well-informed analysis of the impact of the product or system on individuals, society, and/or the environment.</p>
C	<p>Considered identification of a need, problem, or challenge.</p> <p>Considered creation and validation of an initial design brief based on needs analysis and task identification.</p> <p>Competent investigation of the characteristics of some existing products, processes, systems, and/or production techniques.</p> <p>Competent investigation into product material options and analysis for product use.</p> <p>Generally thoughtful investigation into the impact of products or systems on individuals, society, and/or the environment.</p>	<p>Analysis of information to develop appropriate solutions to an identified design brief.</p> <p>Competent communication of product design ideas, using appropriate technical language.</p> <p>Competent testing, modification, and validation of ideas or procedures.</p>	<p>Competent application of skills, processes, procedures, and techniques to create a product or system to an appropriate standard and specification.</p> <p>Competent use of resources, equipment, and materials to create a product or system safely and generally accurately.</p> <p>Development of appropriate solutions to technical problems that may arise during product or system realisation.</p>	<p>Considered evaluation of product success against design brief requirements.</p> <p>Considered evaluation of the effectiveness of the product or system realisation process.</p> <p>Considered reflection on materials, ideas, and procedures, with appropriate recommendations.</p> <p>Informed analysis of the impact of the product or system on individuals, society, and/or the environment.</p>
D	<p>Identification of a basic need, problem, or challenge.</p> <p>Creation of a basic initial design brief with some consideration of a needs analysis.</p> <p>Identification of the characteristics of some existing products, processes, systems, or production techniques.</p> <p>Some basic description of material options.</p> <p>Some description of the impact of products or systems on individuals, society, or the environment.</p>	<p>Some identification of information to attempt basic solutions to an identified design brief.</p> <p>Basic communication of some product design ideas with some use of appropriate technical language.</p> <p>Partial testing and some modification of ideas or procedures.</p>	<p>Partial application of skills, processes, procedures, and techniques to make one or more articles to a limited standard and specification.</p> <p>Some use of basic resources, equipment, or materials to create a product or system, with some consideration of safety aspects.</p> <p>Partial development of some basic solutions to technical problems that may arise during product or system realisation.</p>	<p>Description of product progress, with elements of basic testing against design brief requirements.</p> <p>Some description of the effectiveness of the product or system realisation process.</p> <p>Superficial reflection on or description of materials, ideas, or procedures, with basic recommendations.</p> <p>Some consideration of the impact of the product on individuals, society, or the environment.</p>
E	<p>Limited identification of a need, problem, or challenge.</p> <p>Creation of a very basic initial design brief, with support.</p> <p>Statement of one or more characteristics of an existing product, process, system, or production technique.</p> <p>Limited description of one or more product material options.</p> <p>Identification of one impact of a product or system on individuals, society, or the environment.</p>	<p>Attempted identification of some information to develop limited solutions to an identified design brief.</p> <p>Limited communication of one or more product design ideas.</p> <p>Some attempt at testing and limited modification of an idea or procedure.</p>	<p>Attempted application of one or more skills, to follow an appropriate process, procedure, or technique.</p> <p>Attempted use of resources, equipment, or materials, with emerging awareness of safety issues.</p> <p>Some attempted description of problems that may arise during product or system realisation.</p>	<p>Identification of some product progress, with limited testing.</p> <p>Identification of some aspects of the effectiveness of the product or system realisation process.</p> <p>Identification rather than description of materials, ideas, or procedures, with one or more recommendations.</p> <p>Emerging recognition of one or more of the impacts of the product on individuals, society, or the environment.</p>