

WELCOME TO NAT 5 DM

What does the Design and
Manufacture course look like?



COURSE RATIONALE

- develop knowledge and skills enabling them to appreciate, contribute and adapt to the diverse opportunities offered in manufacturing industries.
- develop creative and practical skills by designing and making solutions to real problems.
- they gain an understanding of the impact of design and manufacture on everyday life.



DESIGN

Design Process

Graphics

Modelling

Annotation

Factors which
influence design

Use of materials

People who influence
design



MAN.

Planning for
manufacture

Measuring,
Marking, cutting

use of hand and
machine tools

Assembling
Surface finishing

Commercial
Manufacture

COURSE BREAKDOWN



Exam paper: 1 hr 45 min

Folio: 7 pages

Practical: Final Model &

Evaluation Page

COURSE BREAKDOWN

45%

80 MARKS

QUESTION
PAPER

30%

55 MARKS

ASSIGNMENT:
FOLIO

25%

55 MARKS

ASSIGNMENT:
PRACTICAL

COPING WITH THE COURSE

Ask questions!

Stick to deadlines

Use study support

Use feedback

Help each other

Plan your time

STUDY SUPPORT IN DM

Using Feedback

Stick to deadlines

Use study support

Refer to
Exemplars

Use Achieve

Plan use of Past
Papers

QS Understanding
Standards

Books / Web
based resources

Using Feedback

Senior Phase Reflection Prompts

Attendance	☐	☐	☐
Behaviour	☐	☐	☐
Engagement	☐	☐	☐
Homework	☐	☐	☐

Working Level:
STATUS
N/A
Red Student will not pass on the basis of the
Purple Student may achieve a D award on the
Amber Student should pass, however is
Green Student should pass and is performing well

My Strength Prompts

- I demonstrated progress when I.....
- I was most confident when...
- A challenge I overcame was...
- I particularly enjoyed...
- The part that felt most engaging was...
- I enjoyed _____ because...
- I showed determination when I...
- I achieved success by...
- I made a positive contribution by...
- Something I can now do better than before
- I exceeded my own expectations when I...

My Next Steps Prompts

- Next time I could do _____ differently because...
- Feedback showed that I need to...
- A skill I want to strengthen is...
- I will aim to...
- To deepen my understanding, I will...
- One area I would like to build confidence in is...
- I will challenge myself to...
- The feedback I need to act on is...
- I will work to develop my...
- My priority for the next term is...
- A realistic goal I have set myself is...

Key Word Prompts
Primary Function Ergonomics Research Questionnaire Specification
Aesthetics Anthropometrics Physiology Initial Ideas Brainstorm Morphological Analysis
Psychology Secondary Function Take your pencil for a walk

Department of Design Technology
Faculty of Technologies



N5 Design & Manufacture Learning Conversation

Attendance	☐	☐	☐
Behaviour	☐	☐	☐
Engagement	☐	☐	☐
Homework	☐	☐	☐

Level/Status: ☐ ☐ ☐ ☐

Name: _____
Class: _____ Teacher: _____

My Strengths

My Next Steps

Design & Manufacture Annotating Ideas (Sketches & Photos of Models)

Use these words within annotations to add clarity and important information about:

- Each part of your design
- Each step of Development
- Describing your options

Market (consider age, gender, use)

Function (consider what it does, how it's used)
Primary Function Secondary Function

Aesthetics (user's sense of beauty, using senses)
Visual: Colour Shape Form
Balance Materials Tactile: Texture
Pitch Tone Volume

Performance (main purpose, how well it works)
Good working order Smooth operation
Environment Number of uses
Tightening Cleaning
Cost Value for Money
Planned Obsolescence

Ergonomics (Anthropometric Data, Physiology, Psychology)
Reach Clearance Strength
Taste Vibration Proportion
Response Age 50th Percentile

Safety (consider, design, manufacture, user, end of life)
Legislation Certification
Staff Training Risk
Hazard Disposal

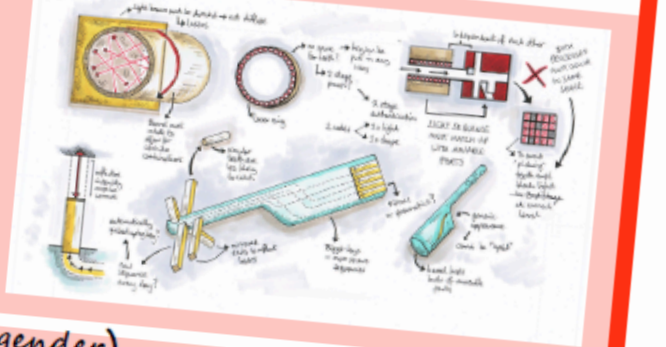
Word Bank

Design & Manufacture Annotating Ideas (Sketches & Photos of Models)

Use annotations to add clarity and important information about:

- Each part of your design
- Each step of Development
- Describing your options
- Explaining your decisions

Sentence Starters



Market (consider age, gender)
This makes the product more suitable for the user because
The end user can use this more easily because
This change appeals to the user more because
This design suits the end user because
The end user will

Function (consider what it does, how it does it)
The function of this part is to The function of this part is important as
This is used by It's easy to understand this because
To use this part, you have to Evaluating this part, I have found
A secondary function of this product / part could be to
The user can Form has to follow function here because

Aesthetics (user's sense of beauty, using senses)
Visually, this part The product appears easy to use because
This choice would make the product feel good quality as
This makes it look safe to use as The noise this makes when closing
The aesthetics of this part affects function / ergonomics / safety because
Changing the proportion/texture/materials/shape/form/line/colour/pattern

Performance (maintenance, durability, value for money)
To keep this working, the user must Designing this part for maintenance
Using this material will extend product life because It's easy to maintain because
Use this material because Use this process because
This increases the capacity of the product by Assembling like this will
This part is more durable now, because It's easier to maintain as

Ergonomics (Anthropometric Data, Physiology, Psychology)
Adjusting the reach/clearance/force/movement/size of this will
Considering anthropometrics, this part has to be Effort needed to move this is
This design gives confidence to the user as Change this because
The size of this allows a wider range of hand sizes to
The intended function of this part is obvious because

Safety (consider, design, manufacture, user, end of life)
This is safe to use as This is not safe to use because Using this could
The end user might hurt themselves on this part by
Repeated use of this might tire the end user by
This part doesn't look safe to use The material is / isn't safe, so
Changing this will make it safer because

Annotating Ideas

Refer to Exemplars

A collage of five photographs showing the construction of a wooden chair. The images depict various stages: a wooden frame being assembled, a yellow-painted wooden piece, a close-up of a wooden joint, a wooden frame with a metal spring, and a wooden frame with a metal spring and a wooden seat.

			Candidate B
Practical Skills	Activity	Marks Available	Actual Marks
Measuring and marking out	Measuring and marking out	9	9
Using hand and machine tools	Using hand and machine tools	18	18
Assembling components	Preparing for assembly and assembling the prototype	5	5
Finishing	Preparing surface, applying techniques and final finishing	9	9
Evaluating	Evaluating the design proposal	4	4
Total mark		45	45

Shelf Evaluation

I tested the shelf to see if it held all of the things that it was designed to do and it did.

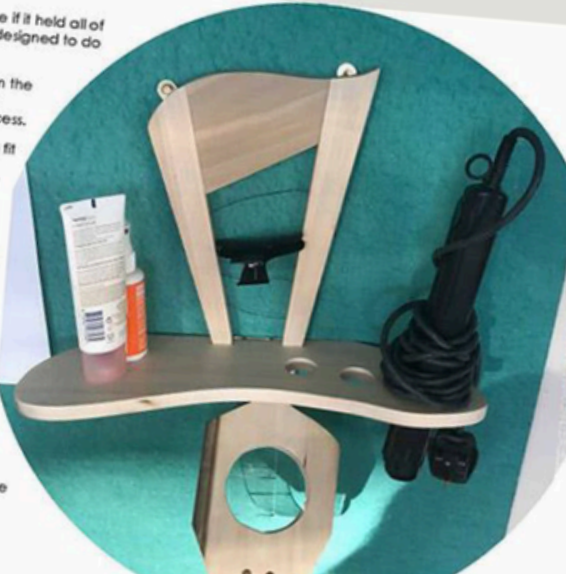
The hairdryer: This fits in the hole and is reasonably secure. It is easy to access.

The straighteners: These fit in the hole and the cable can be wrapped around them to stop them falling through, although I am a bit worried they fall through and break.

They are more secure if stored when open.

The brushes: These fit well into the holes and can also be stored in the strings. They were easy to get in and out.

Other items: The shelves have sufficient space for additional hair products. The strings can be used for hair accessories too.






I asked the girls in my class what they thought about the design.

Do you think the shelf has a guitar theme?

YES	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
NO	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

All of the girls felt I had met this.

They said they liked that the design was slightly abstract.

Would this shelf fit in with a simple modern style room?

YES	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
NO	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

5 out of 7 thought this would. The two who didn't said they would prefer if the wood was painted white.

I am really pleased with the design. I forgot that I was supposed to whitewash some of the wood until I had already applied the varnish. I still met my specification to use cool natural colours and materials.

I had to change the length of the shelf and the order of the holes as they wouldn't fit on the original shelf length.

I also had to change the assembly of the guitar head. I couldn't do the rivets as this would have to be done after the plastic had been formed. I used contact adhesive to secure shorter rivets into a blind hole passing through the acrylic.

Refer to Exemplars

N5 Design and Manufacture
Research pro forma
Design brief 1: a small shelf

Notes to candidates

Before you start the research you should have read the instructions for candidates and be familiar with:

- the brief
- the skills you have to demonstrate
- the type of evidence you have to provide

You should speak to your teacher or lecturer if you are unsure about the areas above.

Research

The company has carried out research and identified a few requirements for the shelf. You should gather further information to ensure the proposal is suitable for the company and the teenagers you know.

You should record your research information on this sheet (you can use both sides).

You should use findings from your research to complete the specification below.

A small shelf – specification

The shelf must:

- demonstrate a high level of craftsmanship
- have simple modern design
- use calm, neutral colours and materials
- be influenced by guitars
- incorporate guitar features such as strings
- hold hair brushes (see research for size)
- hold hair dryer & straighteners (research has sizes)
- be easy to get things in and out
- be easy to wall mount.

RESEARCH FINDINGS – You may use the other side of this sheet

I am going to design for teenage girls.

I asked the girls in my class:
What bedroom best matches your style?

A B C D

Some of the reasons:

- A – Calm colours, simple, relaxing, modern, white wood
- B – Too busy, too much pattern
- C – Too busy, too bright, chaotic
- D – Simple, light wood, not too busy

MUSIC THEME

What is the first musical instrument that comes into your head?

PIANO GUITAR DRUMS

PIANO GUITAR DRUMS

PIANO GUITAR MOST POPULAR.

FUNCTION

I am designing a shelf to store hair products. Which of these should it store?

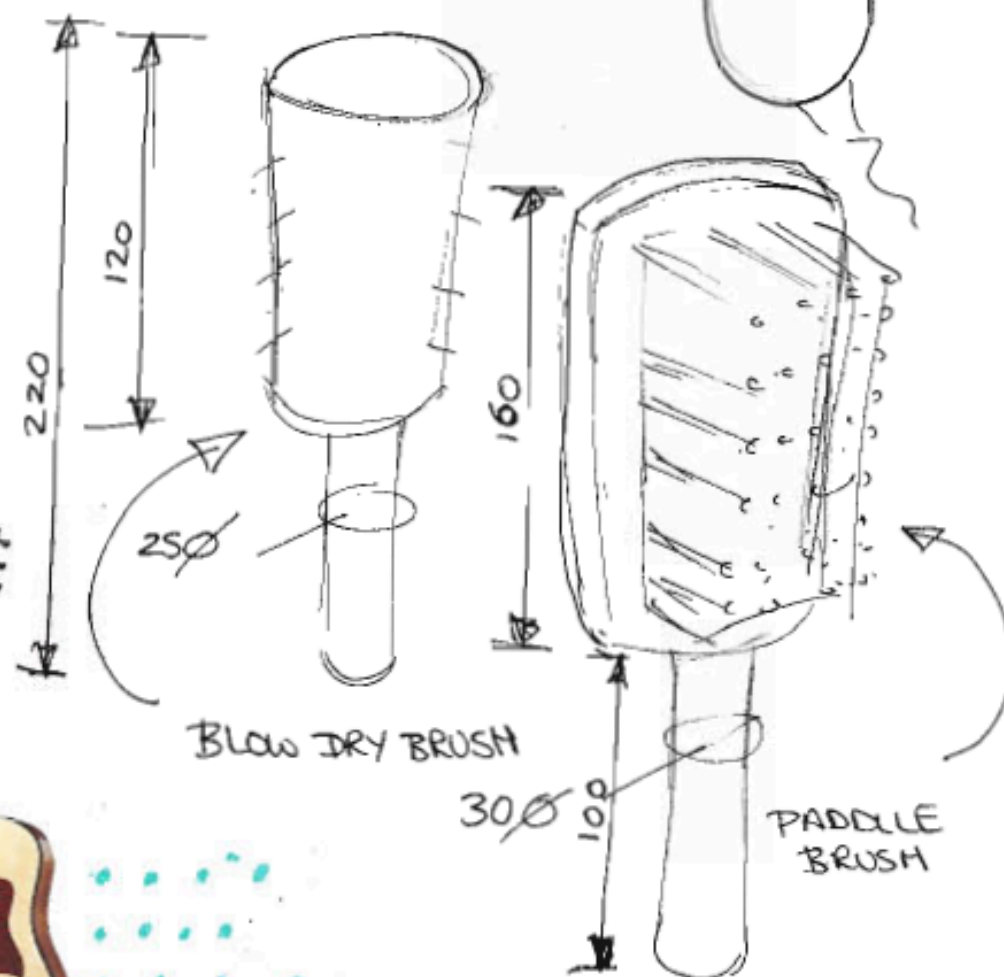
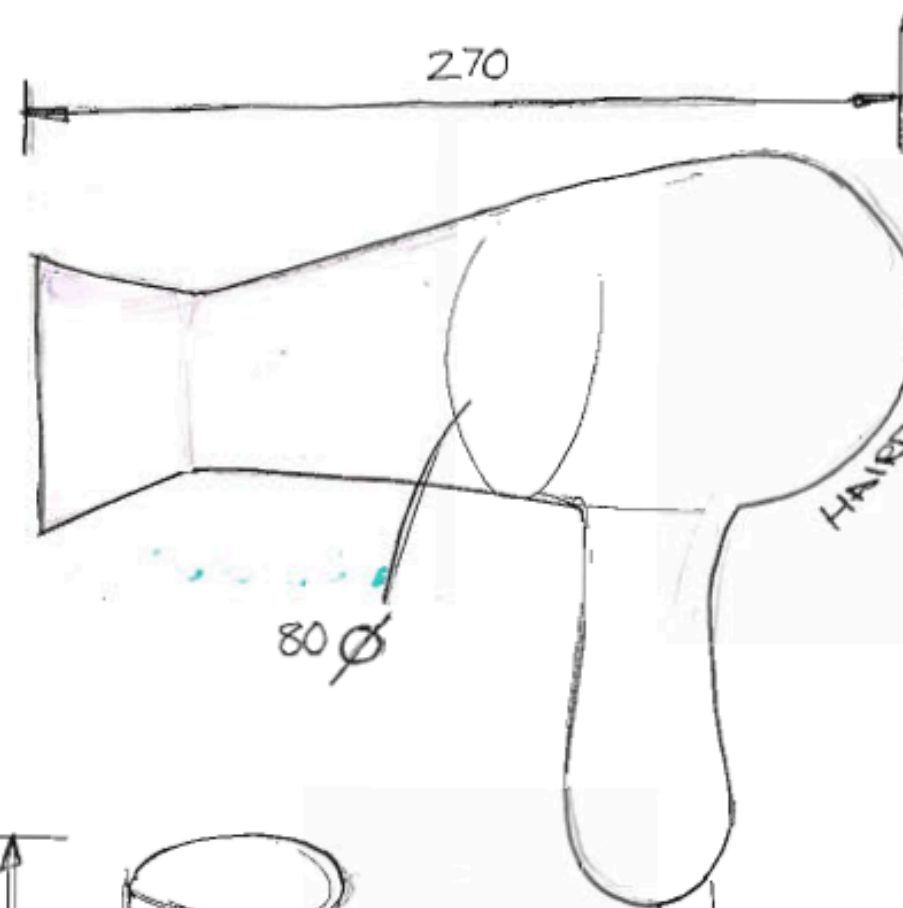
Hair dryer	5/7
Straighteners	6/7
Brushes	7/7
Comb	2/7
Hair products	3/7
Accessories	4/7

CANDIDATE B -1

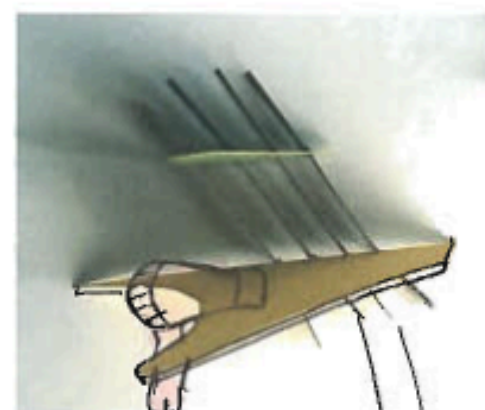


Electric Guitar

Acoustic Guitar



I measured my hair stuff to get the key sizes to make sure they fit in my design.



HAIR DRYER
SITS IN
SHELF INDENT.

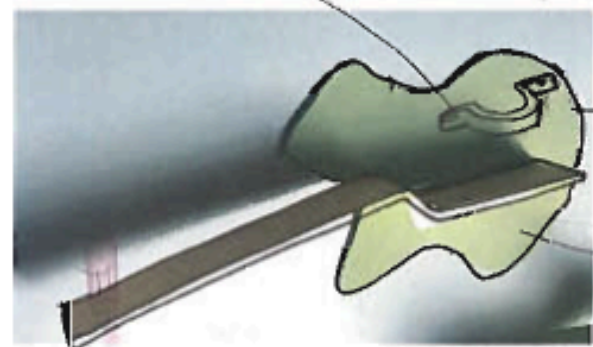


HOLES TO STORE
BRUSHES

IDEA FROM
ELECTRIC GUITAR

BRACKETS TO STORE
HAIR DRYER / STRAIGHTENER

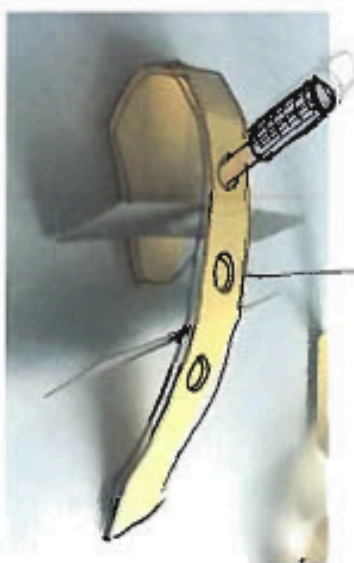
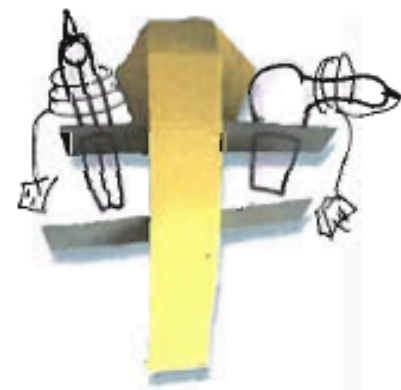
COULD BE METAL...
OR PLASTIC
RODS



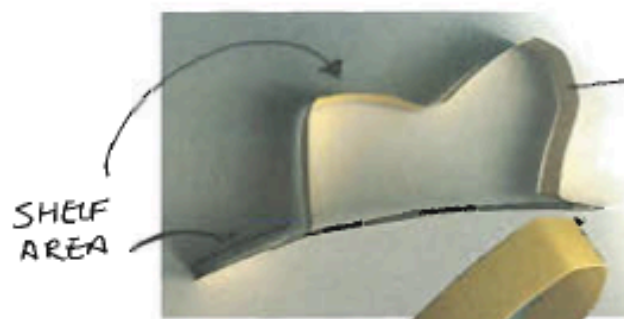
LIMITED
ASSEMBLY

LOOKS TOO
MUCH LIKE
A GUITAR

SUBTLE
MUSIC THEME

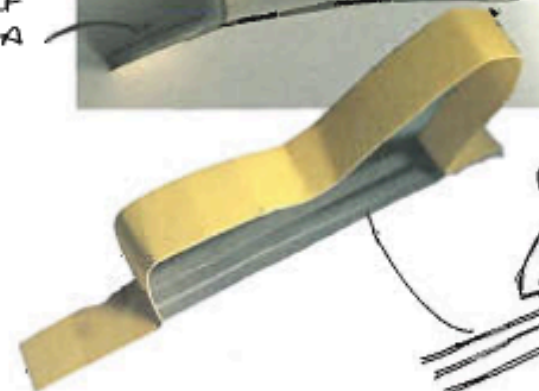


HOLES TO STORE
BRUSHES.

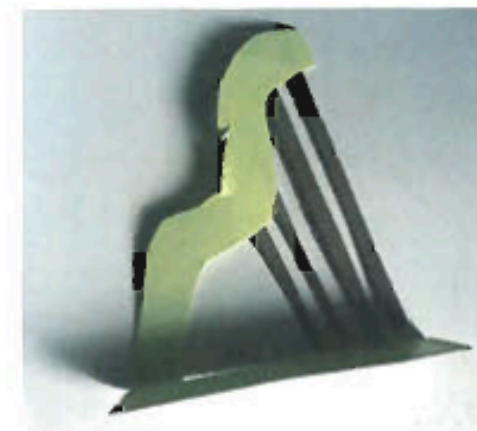


SHELF
AREA

GUITAR
SHAPE FORMED
FROM ACRYLIC
OR PLEXI PLY.



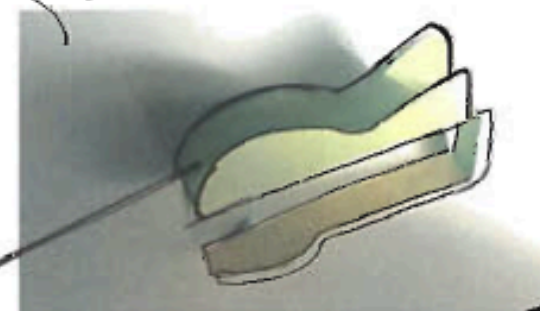
ROPE/ELASTIC?
HOLDS STUFF IN
PLACE



COULD ALSO BE USED
LIKE THIS



ITEMS
HIDDEN IF
USED THIS WAY UP



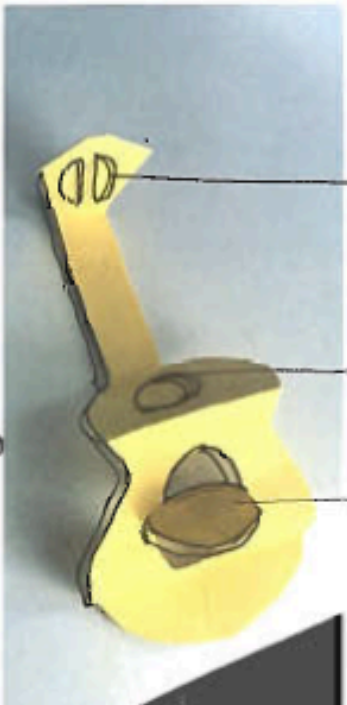
HAIR DRYER
STORED IN
POCKET AREA



SPLIT
HOLE FOR
STRAIGHTENERS

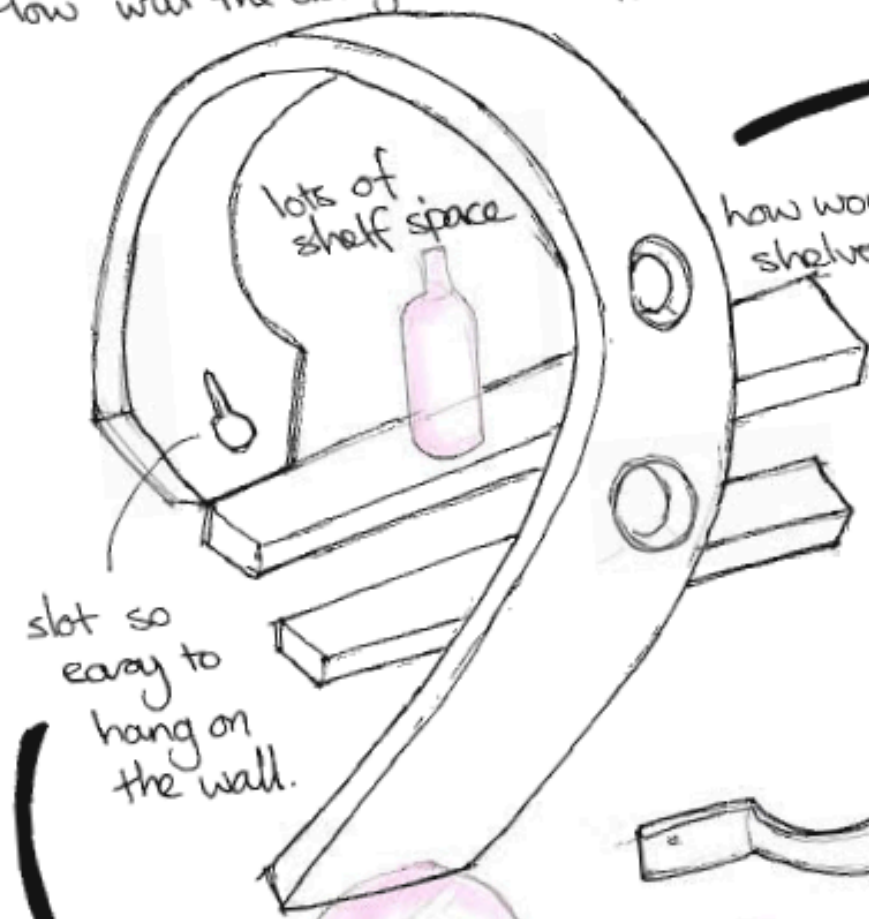
HOLE FOR
HAIR DRYER

COULD REVOLVE
MIRROR/
SHELF



CANDIDATE B-3

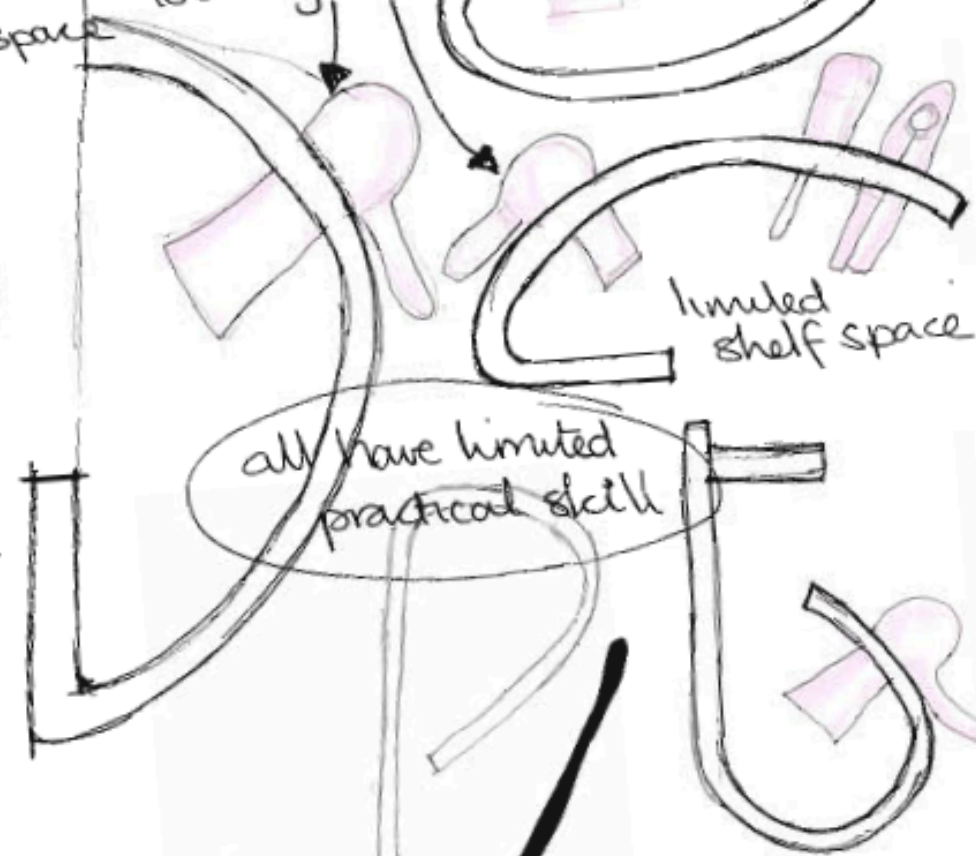
How will the design hold stuff?



how would the shelves attach?



hair dryer at an angle is more interesting looking.



a bracket could be screwed on. I could make this from acrylic or aluminium would look messy and ruin the look.

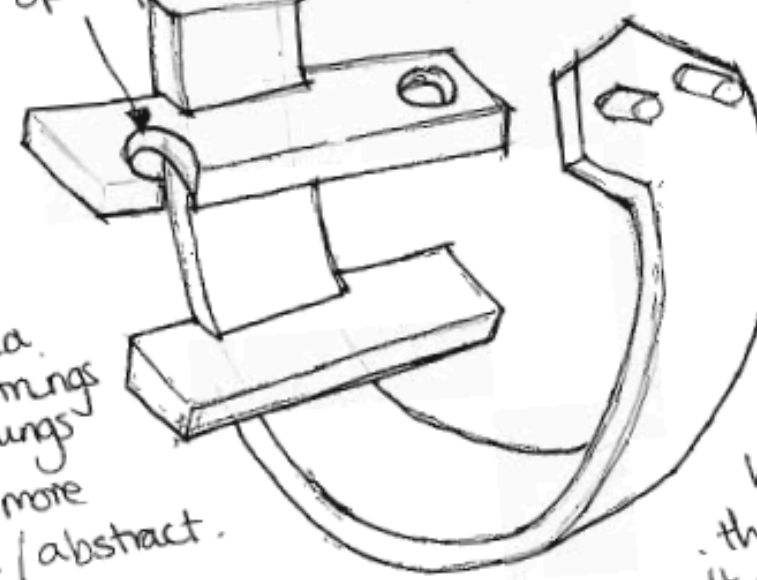


dowels or rods could be used. Like tuning pegs on a guitar

I like the idea of using strings to hold things

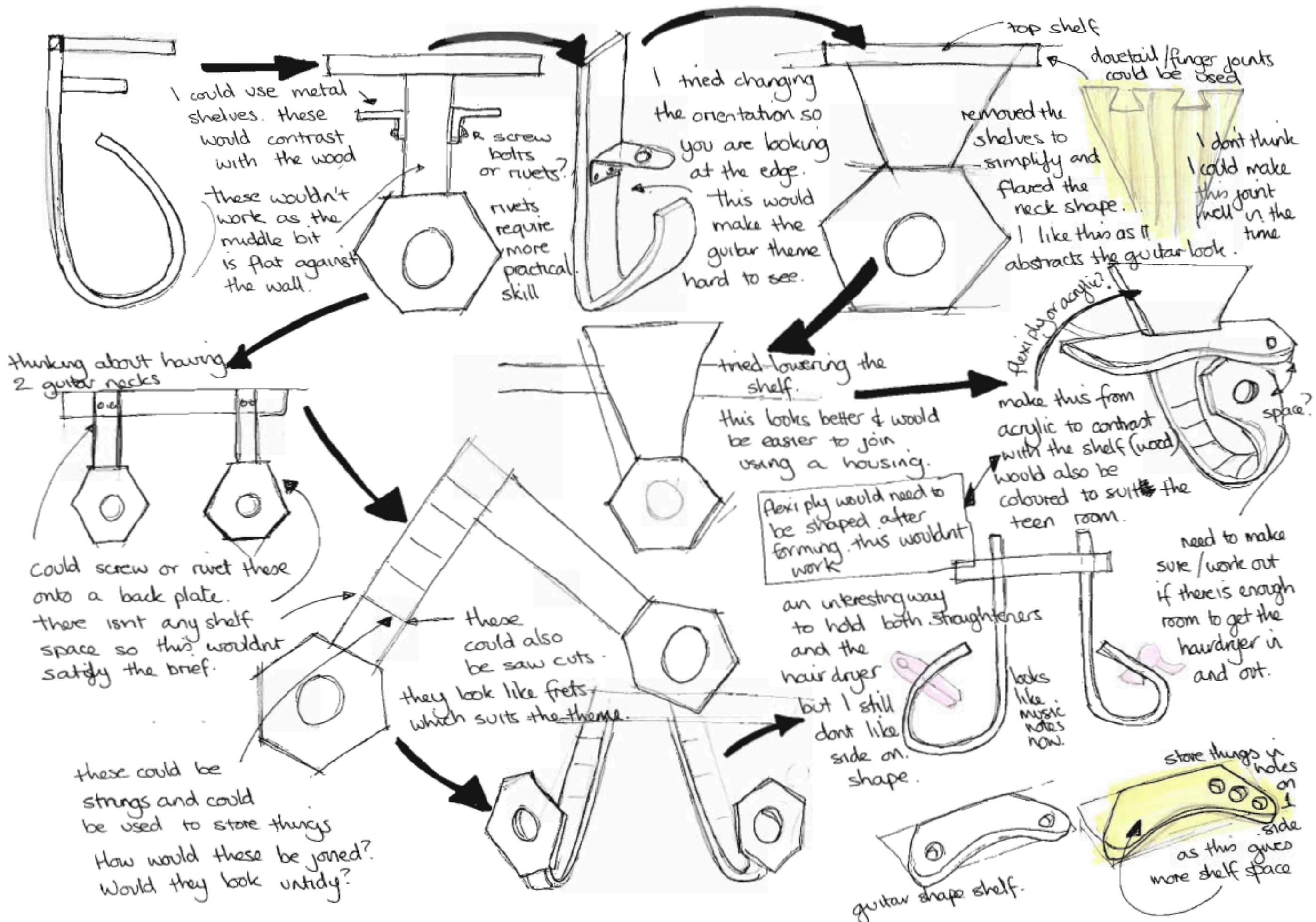
this is more unusual / abstract.

don't like the open front hole

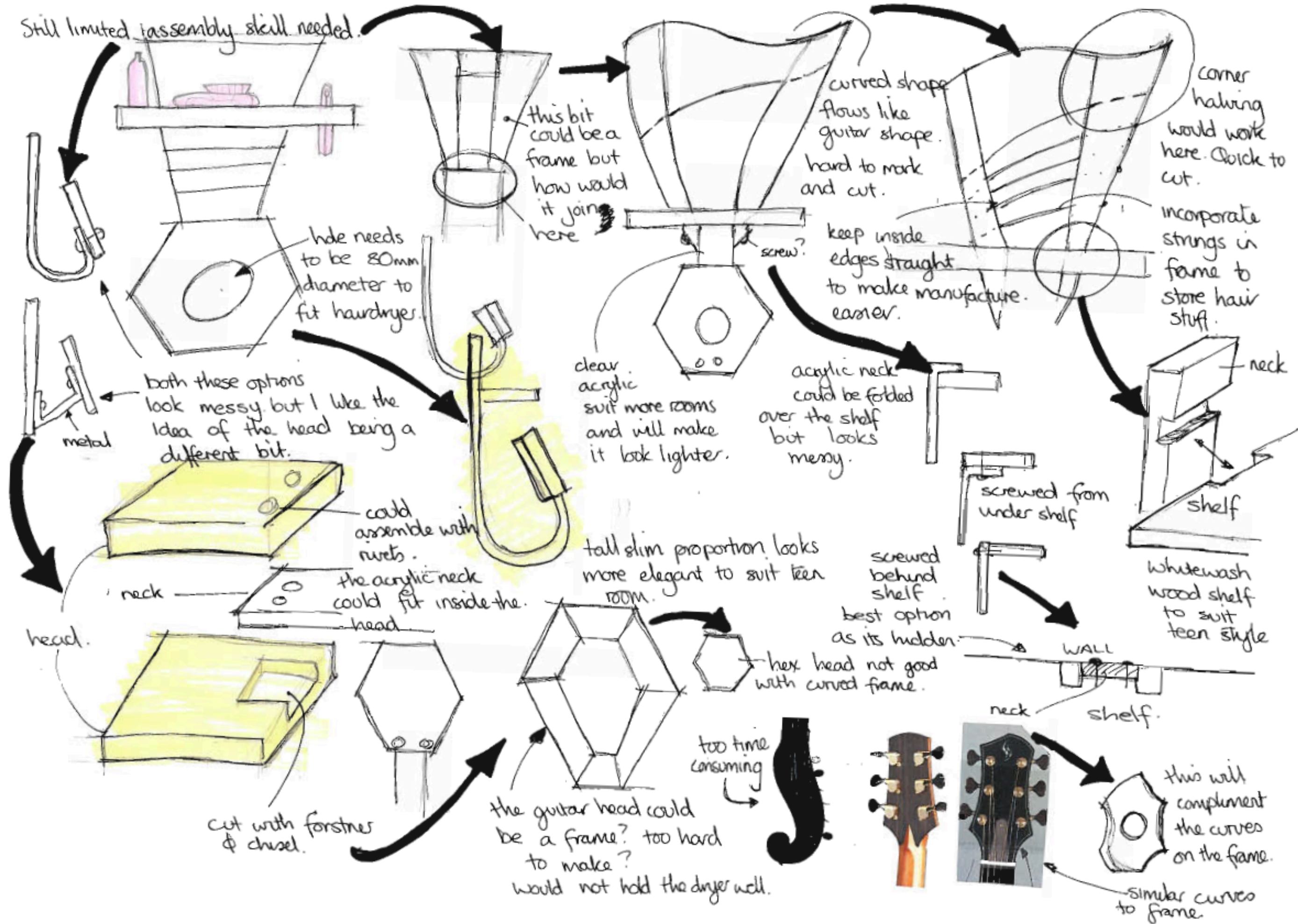


using the guitar head to hold the hair dryer makes it more of a feature. looks better / more secure than dowel option.

CANDIDATE B - 4



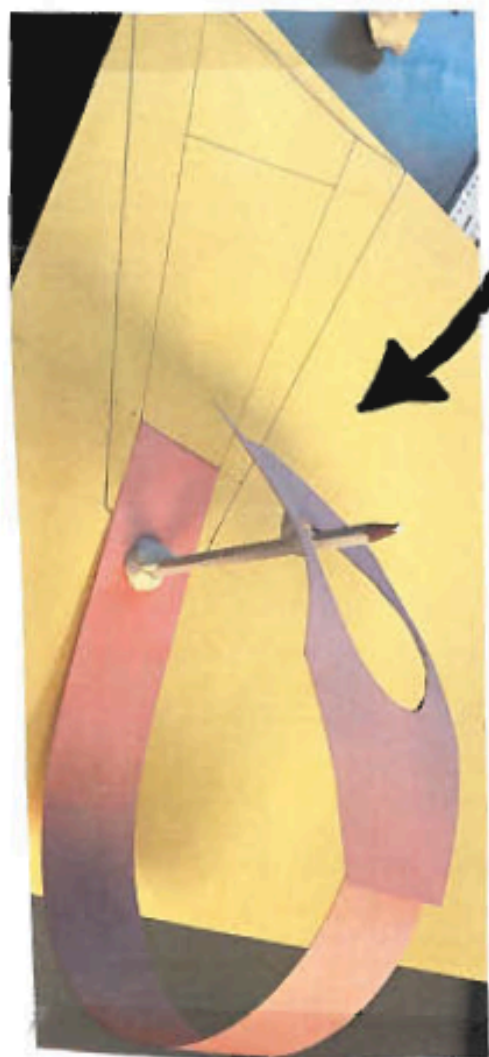
Still limited assembly skill needed.



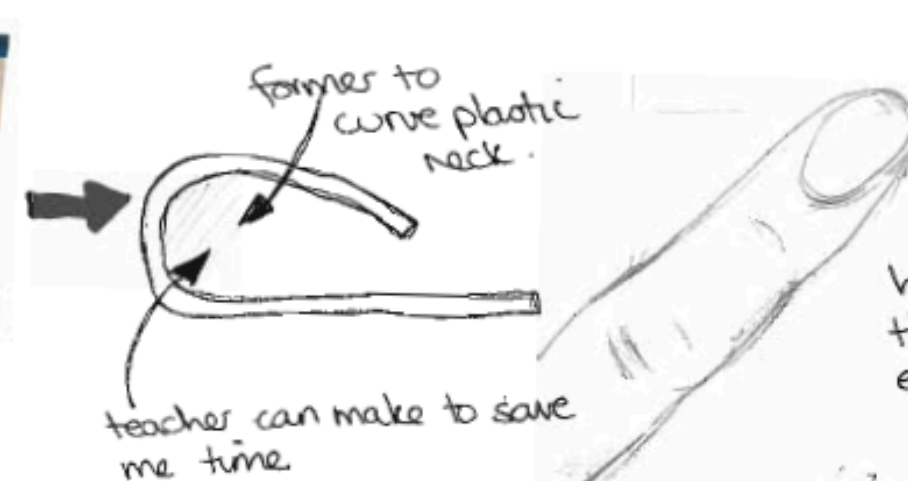
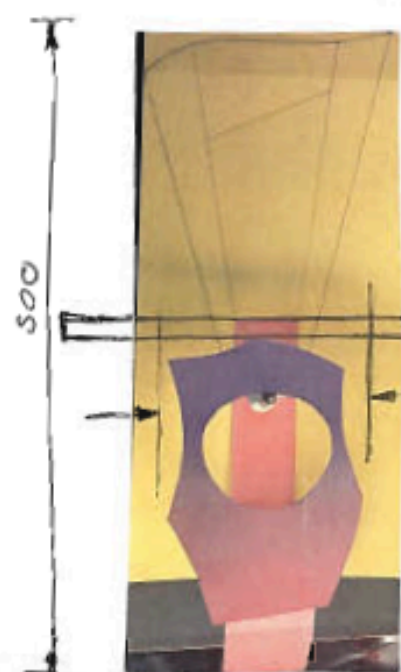


The hair dryer will need to be held in a slot close to 45°. I tried more vertical angles but the hair dryer kept falling out.

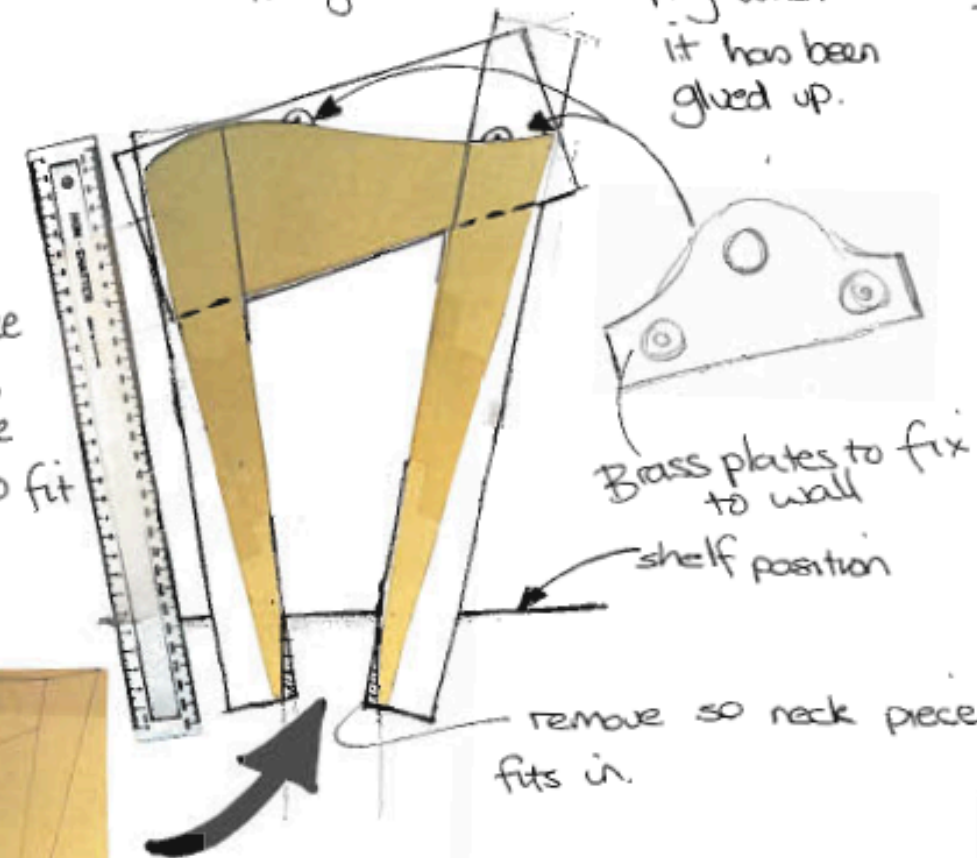
The angle on the model is suitable to hold the hair dryer. I can use sizes from the model to plan the manufacture



The full size model was made to be 500 tall to fit in the box.

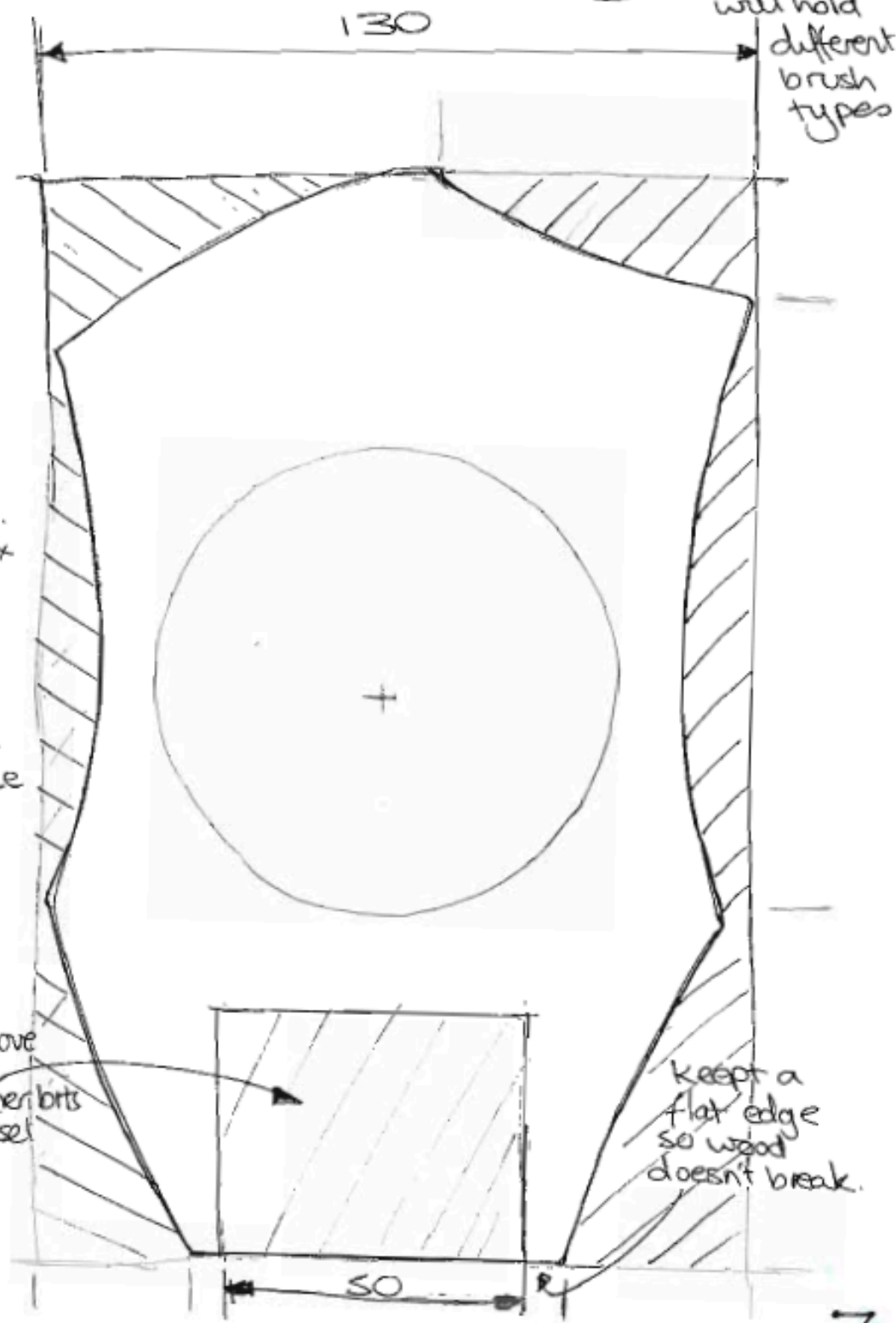
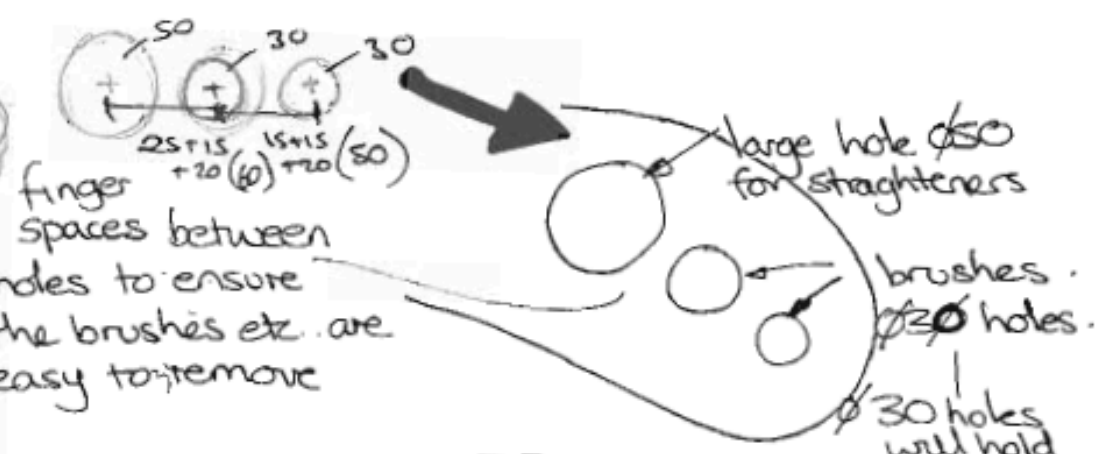


I think the easiest way to make the frame is marking the joints then shaping when it has been glued up.



shelf positioned above the guitar head

holes for brushes & straighteners will not be in the area of the head as there wouldn't be enough space when the hair dryer is being stored.



N5

Design and Manufacture DESIGN
TASK 1: A small shelf
PLANNING FOR MANUFACTURE SHEET



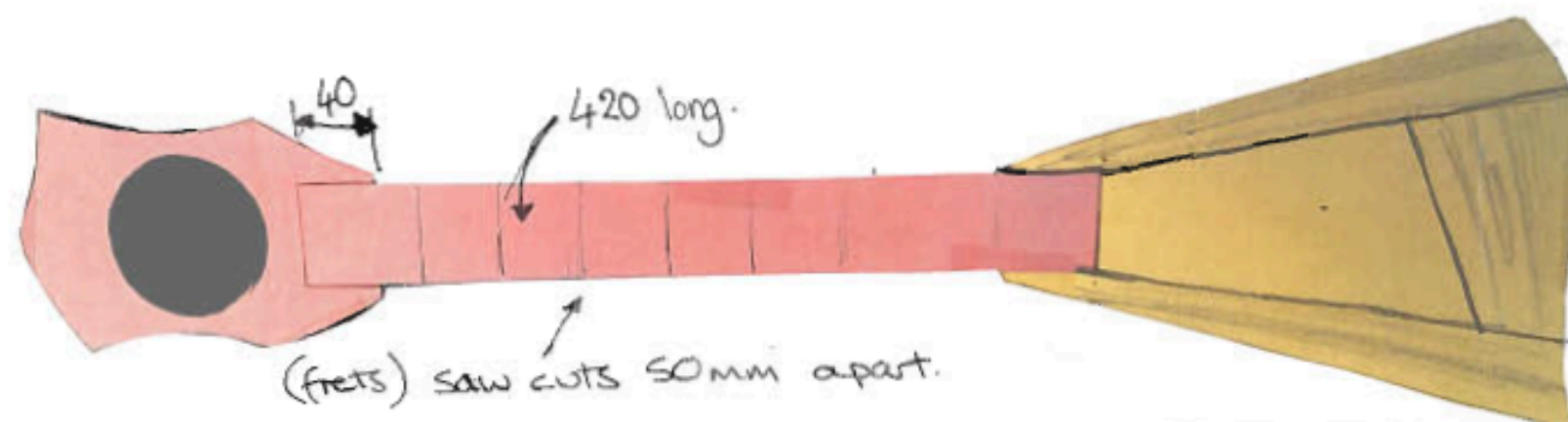
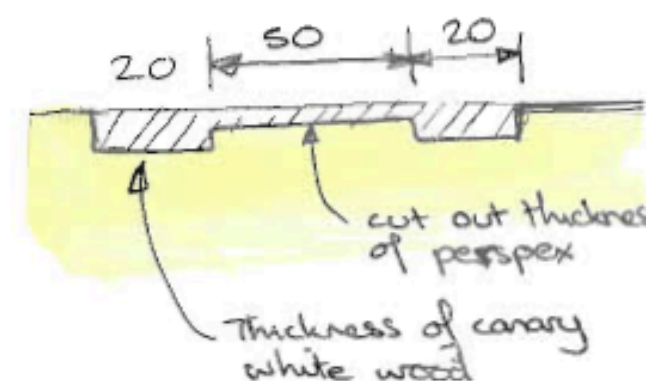
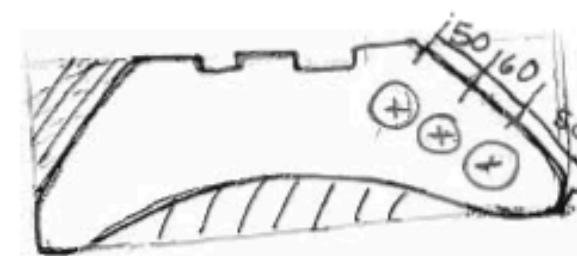
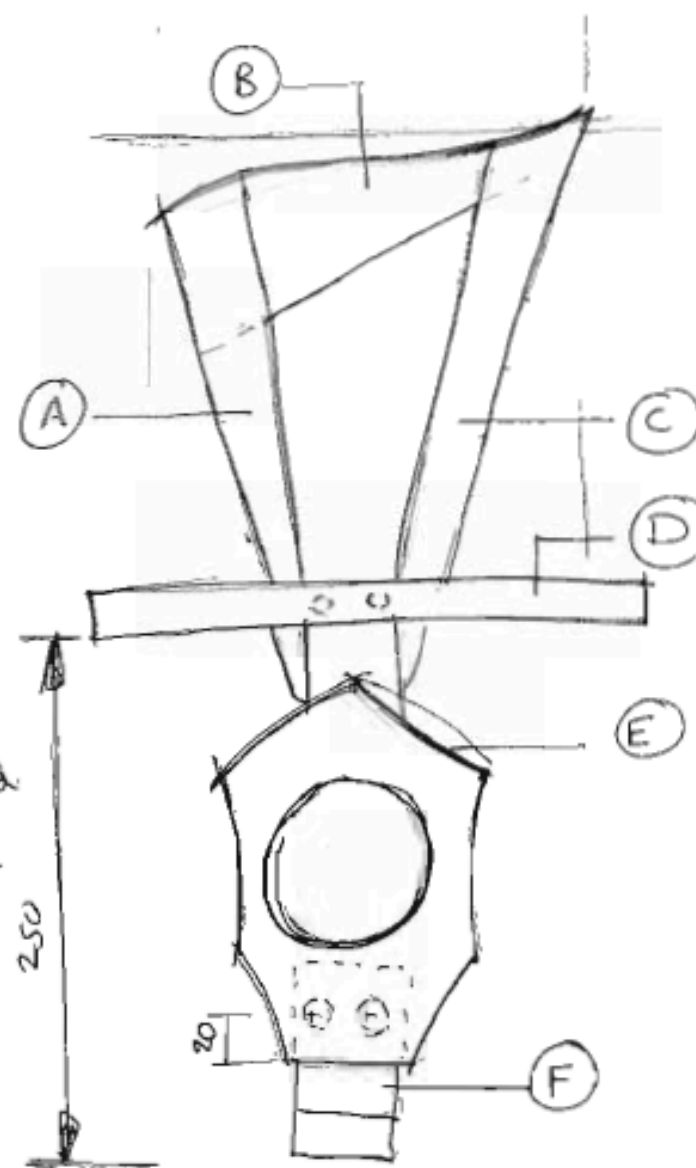
SEQUENCE OF OPERATIONS

STAGE	OPERATION	TOOLS/EQUIPMENT
	PERSPEX: Mark out holes and frets. Saw lines & drill. finish edges then form.	steel rule, try square. drill and saw. file and wet and dry oven and former.
	FRAME: Mark joints and shape. Cut and fit. Sand and assemble	sliding bevel tenon saw/chisel glue and clamps
	GUITAR HEAD & SHELF: mark shape, holes and joint. cut and finish	Template / freehand. try square copied saw, sand & wax. <i>white wash wood</i>
	ASSEMBLY: • rivet head to neck. • screw neck onto shelf. • glue shelf to frame.	rivets and hammer screws and screwdriver PVA and clamps.

CUTTING LIST

PART	MATERIAL	QNTY	LENGTH(mm)	BREADTH(mm)	THICKNESS (mm)
A	canary white wood	1	310	50	16
B	"	1	230	20	16
C	"	1	360	50	16
D	"	1	300	125	16
E	"	2	190	130	8
F	perspex.	1	420	50	6

WORKING DRAWING/SKETCH



NAME

CANDIDATE B - 8

8

Stick to deadlines

- If you are worried about any deadline let your teacher know, we are here to support you
- Keep pace from start of Design Assignment
- Work cannot go home, you can prepare at home though
- Study Support Twilights (long run at project)

National 5 Design & Manufacture Assignment

DESIGN ■ MAKE ■ IMPROVE ■ A BRIGHTER TOMORROW

PEOPLE
IDEAS
MATERIALS
SOLUTIONS

GOOD
IDEIGN
BUILDS
BRIGHTER
FUTURES

DESIGNING		HAND IN DATE
● Analysing a brief	(8 marks)	18th Dec
● Generating ideas	(9 marks)	13th Jan
● Development 1 - Development 4	(20 marks)	27th Jan
● Using models	(6 marks)	
● Using graphics	(6 marks)	
● Planning for manufacture	(6 marks)	3rd February

PRACTICAL		HAND IN DATE
● Measuring and marking out	(9 marks)	3rd March
● Using hand and machine tools	(18 marks)	3rd March
● Assembling components	(5 marks)	3rd March
● Finishing	(9 marks)	10th March
● Evaluating	(4 marks)	10th March

**National 5 Design & Manufacture SQA Exam**

**Thursday 20th May
13:30 - 15:15**

SKILLS FOR A BETTER TOMORROW

LEARN
DESIGN
MAKE
SUCCEED

Stick to deadlines

Course / Classwork
is on Teams:

If we miss lessons, keep
up to speed with support
from teacher and teams



Classwork

7 files

▼ Project 2 - Controller - Remote



Research Page.afpub



N5_Design-and-Manufacture_Assignment-Research-GUIDE.afpub



Project 2 - Design Brief



n5-h-ah-data-booklet-design-manufacture



Anthropometric Data 14 to 16 yr old and adults

Plan use of Past Papers

COMMAND WORDS

STATE

DESCRIBE

EXPLAIN

JUSTIFY

Past papers and marking instructions

Find past papers and marking instructions for your revision. You can search by topic and or refine by subject and level. To add the matching marking instructions simply tick the box.

We provide up to five years of past papers.

Design and Manufacture



Topic name

Higher



Go >

☒ Include Marking Instructions

Reset the search form

Plan use of **DIGITAL** Past Papers

Topic name

Higher

Go >

☒ Include Marking Instructions

Reset the search form

Digital question papers

Question papers in digital format for candidates with disabilities and/or additional support needs.

- [Digital question papers](#)

SECTION 1 — 60 marks
Attempt ALL questions

1. A design proposal for a coffee station is shown below.



(a) A softwood was considered for the back, base and side.

(i) State two benefits of using softwoods in the manufacture of the coffee station.

Benefit 1

Benefit 2

MARKS

DO NOT WRITE IN THIS MARGIN

2

* X 8 1 9 7 5 0 1 0 2 *

Use study support

- Study support twilight sessions in department.
- Targeted to pupils
- Targeted to topics
- Thursday after school / Other options

Books / Web based resources



Books / Web based resources

National 5 Design and manufacture – BBC Bitesize
<https://www.bbc.co.uk/bitesize/subjects/z6xpb9q>

Boclair Academy website
<http://www.technicaldept.co.uk/page7.html>

ACHIEVE

<https://www.youtube.com/c/productdesignermaker>

