St George's School
Aim Higher

Sixth Form Options

Design & Technology

Product Design- AQA 7552


Wood
work


Metal
Tech


Shelf
putter
uppers

Disaster Relief

Living & Working Spaces

Inclusive Design

Real world Design Problems

Climate Change

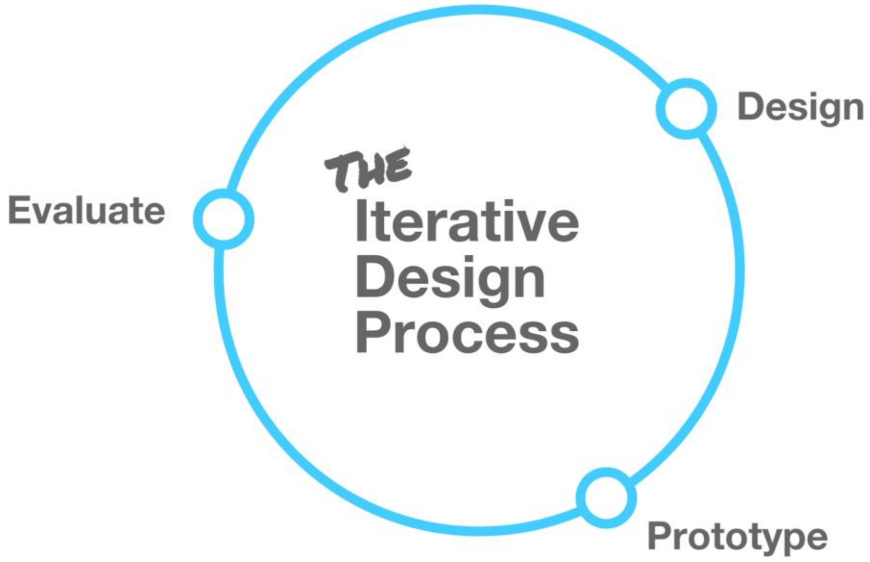
Protection

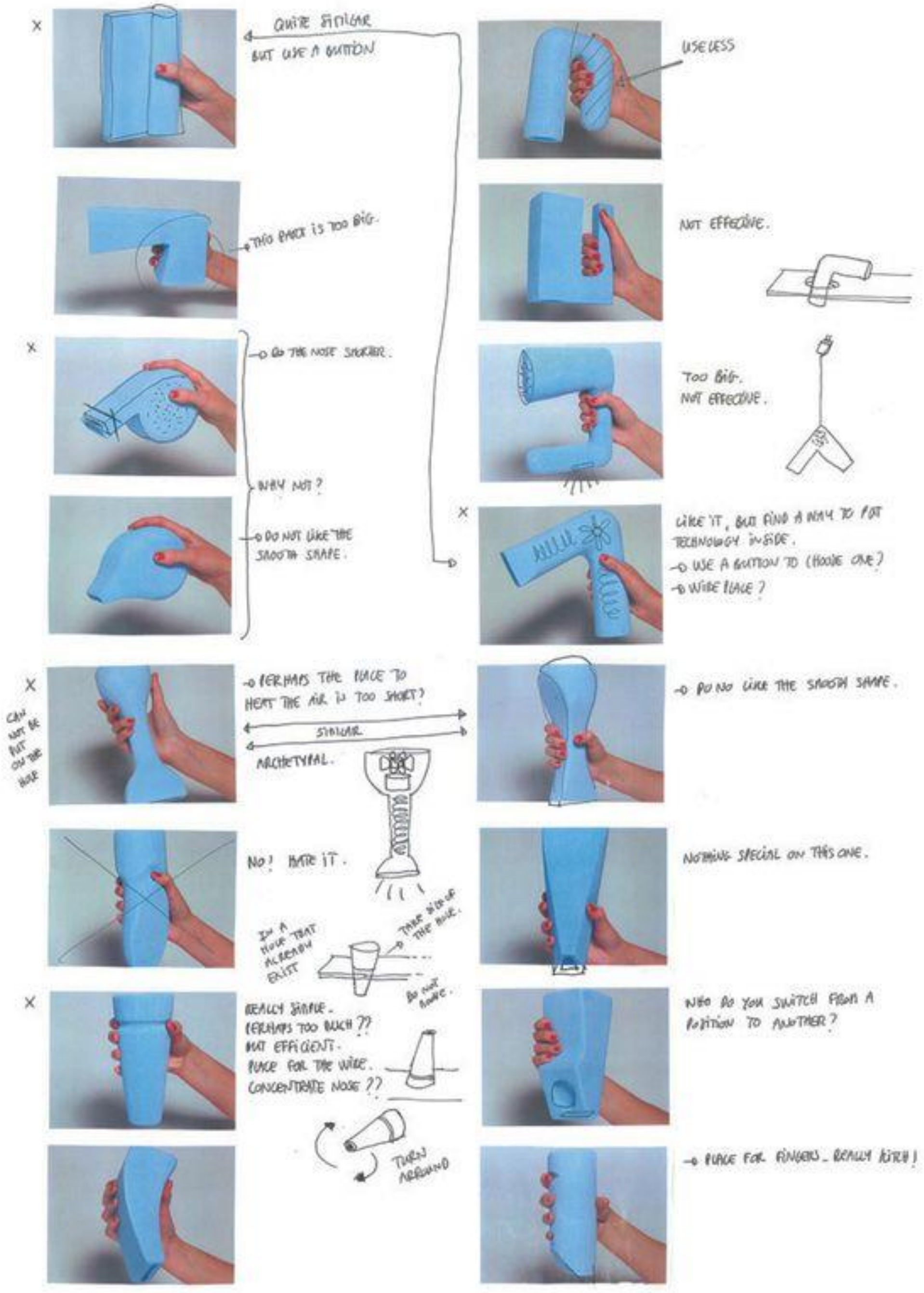
Challenged Communities

Waste Management

User Centred

Exploration


THE
Iterative
Design
Process
Design
Evaluate
Prototype


QUITE SIMILAR
BUT USE A BUTTON
USELESS
THIS PART IS TOO BIG.
NOT EFFECTIVE.
TOO BIG.
NOT EFFECTIVE.
WHY NOT?
NO! HATE IT.
NOTHING SPECIAL ON THIS ONE.

How can we empower our students to become better people and make better choices in the world around them?

Design Thinking

Design Tasks	**Making Tasks**	**New & Emerging Technologies**

Design & Make

CAD	**CAM**	**Systems**

50% of A-Level

Coursework based
Assessed internally, moderated externally

Contextual based research, design and develop.

25% of A-Level

Externally assessed

Specialist knowledge, technical and designing and making principles.

25% of A-Level

Externally assessed

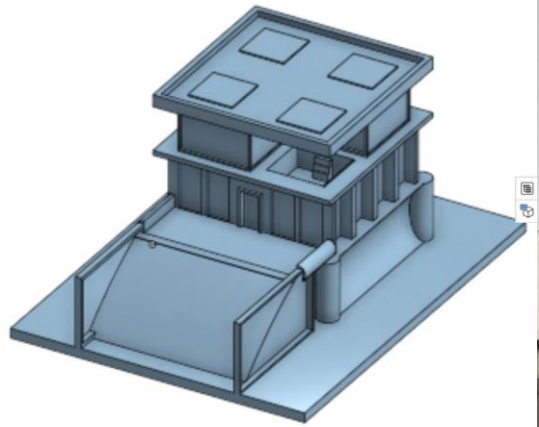
Core technical principles and core designing and making principles

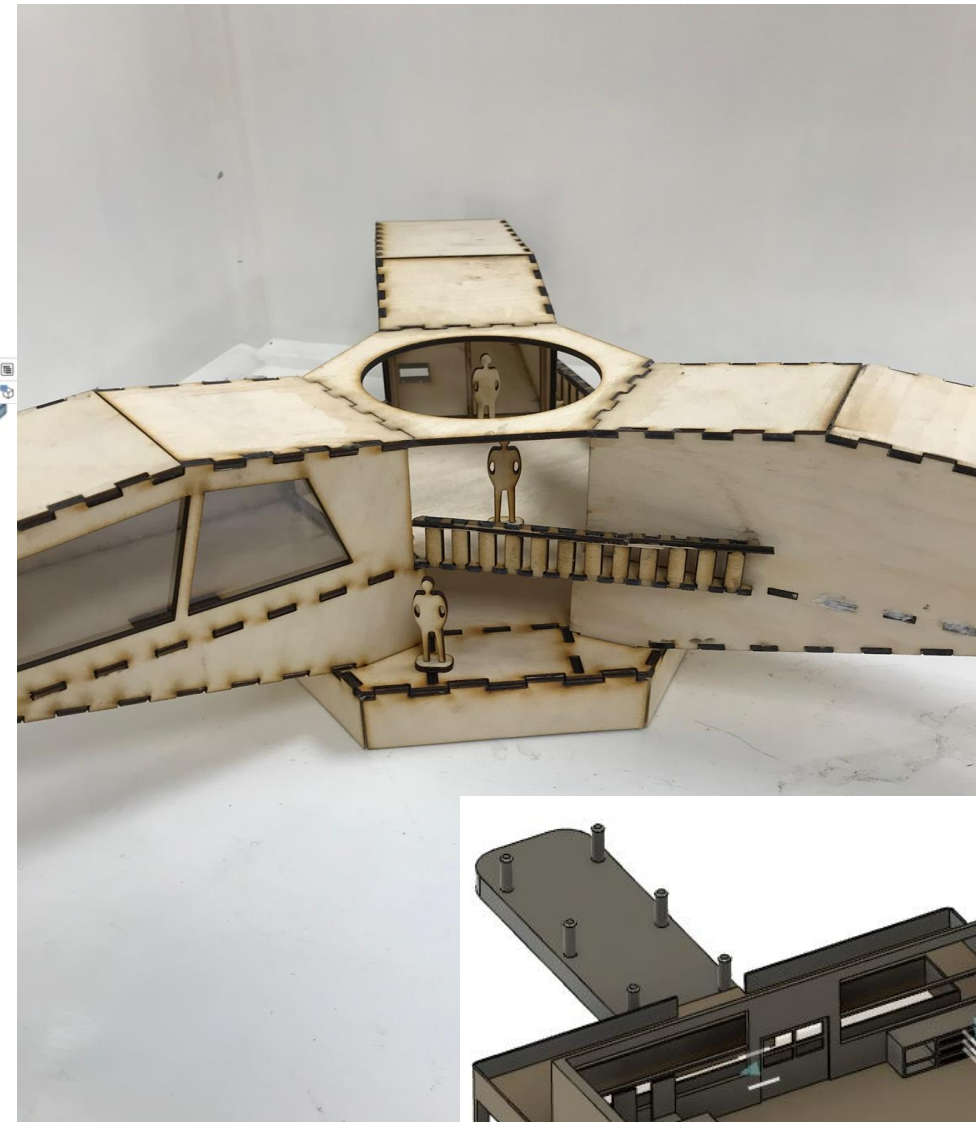
Entry Requirements

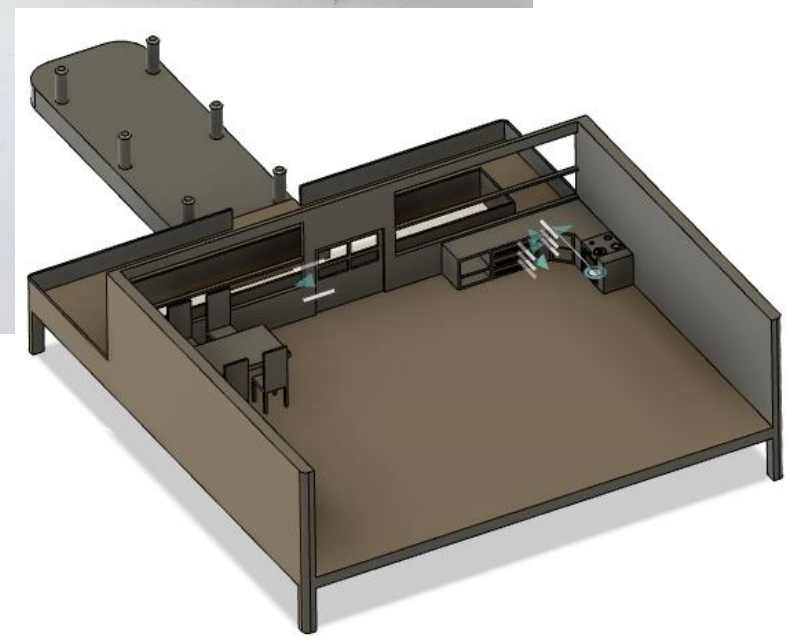
5 GCSE 9-5 including Maths and English

Grade 6 D&T

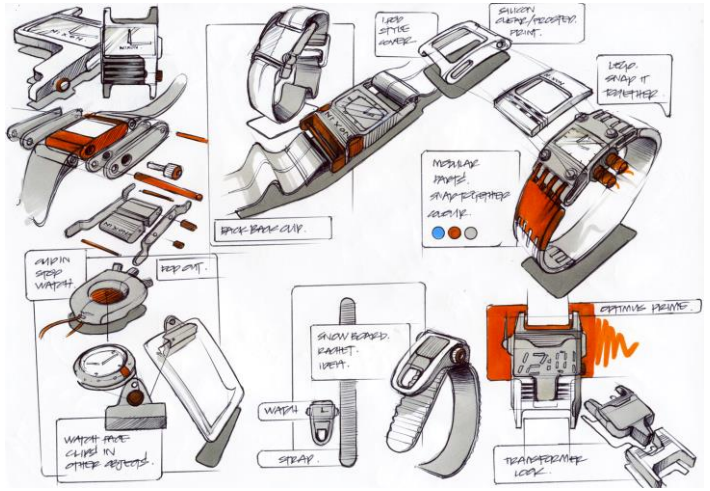
Time commitment

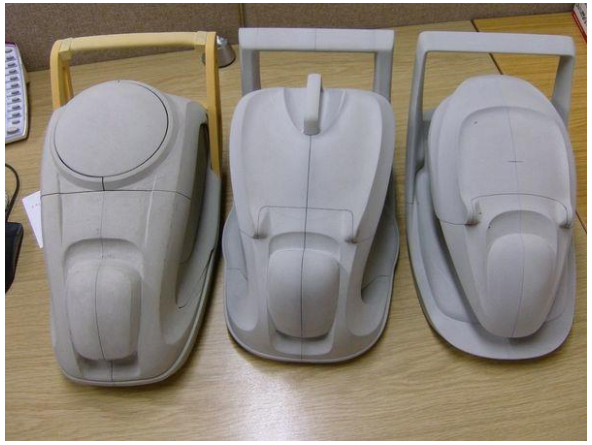




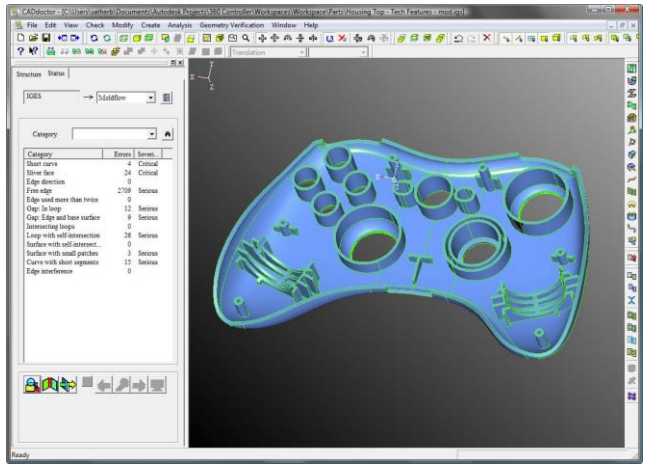


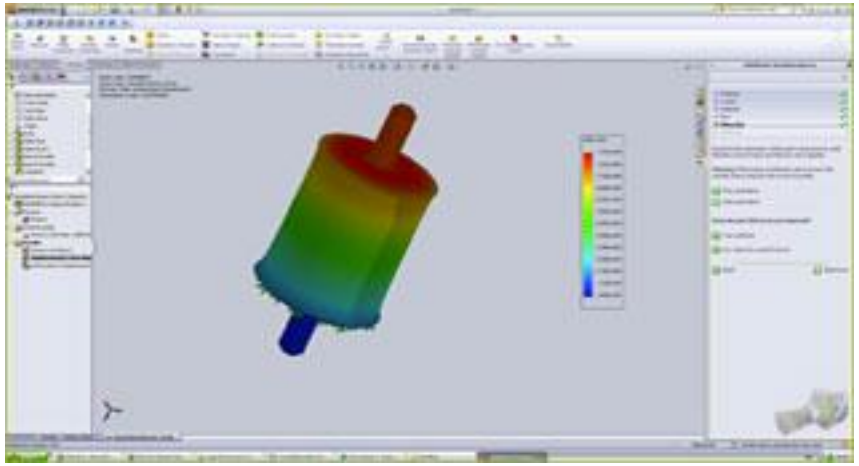

Light/White Transfer Paper
Photo Paper Direct - Unit 8, Shakespeare Street Industrial Estate, Watford WD2
T: +44(0)1923 232590 E:
paperdirect.com Facebook: www.facebook.com/PhotoPaperDirectUK





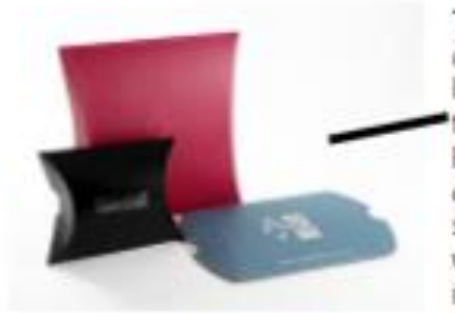
Design Folders





Products

This dog is made out of cardboard and is very small,compact and cute. It is unclear how large and thick the digital clock is and if it requires batteries of some sort as it may not fit in the royal mail large letter slot.These fit together with flat pack slots



This little box is very well developed because it is small but because the sides fold in it makes the product stronger and sturdier to hold smaller items in. The beauty of this product is that it can be any size and any colour and designed with any requested patterns to make it personal. These have no slots or joints to fit together but the have indents so they fold into a secure place.

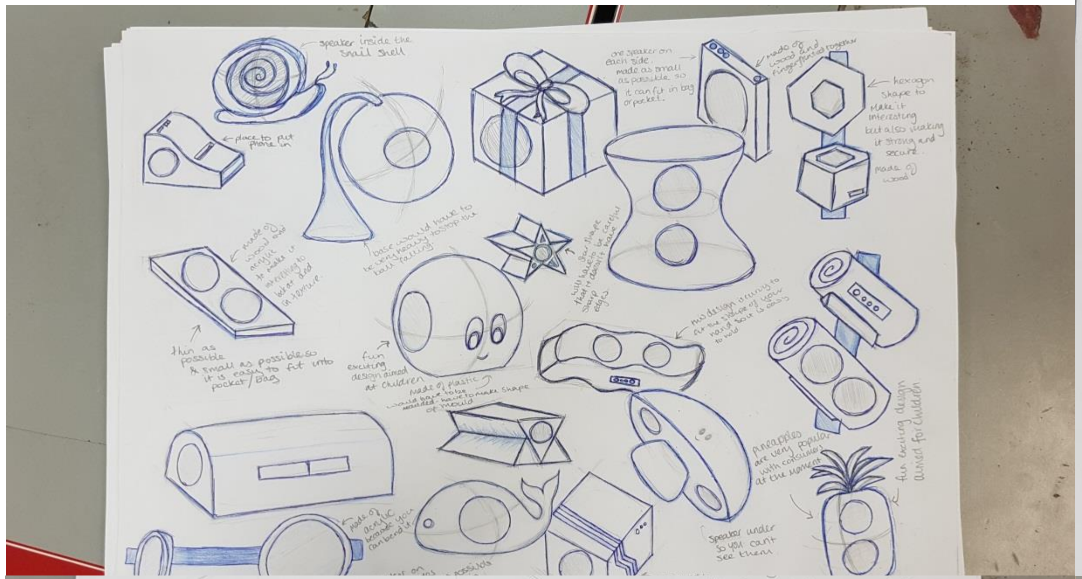
The cracker is creative intriguing and enjoyable but it is very big and looks to big to fit the slot,also the risk of the 'crackle' part of the cracker is dangerous and also under 18s are unable to purchase it proving it is a health and safety hazard. However the design and idea is really cool despite not being foldable.this design does not necessarily have folds to make your self it is more of a 'make it entirely by yourself'- product

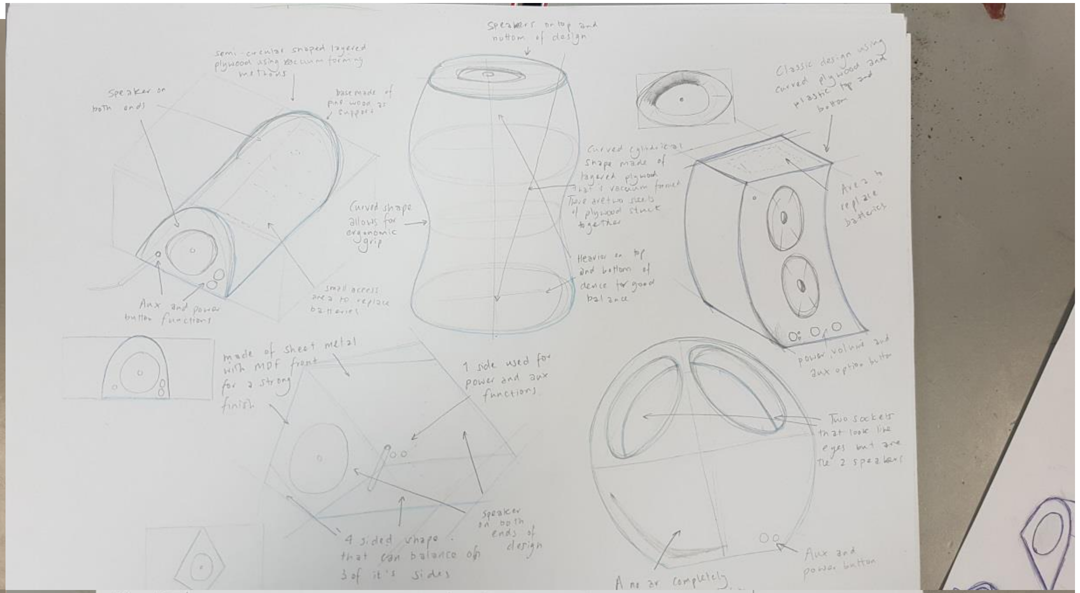
This desk tidy looks very sturdy and fits together with slots, the colour pops and looks very professional. It looks quite big and the pieces are probably too big for a large letter slot unless adapting it to be smaller (which means you may not fit some of the larger folders in). This would have flat pack slots all fitting together.

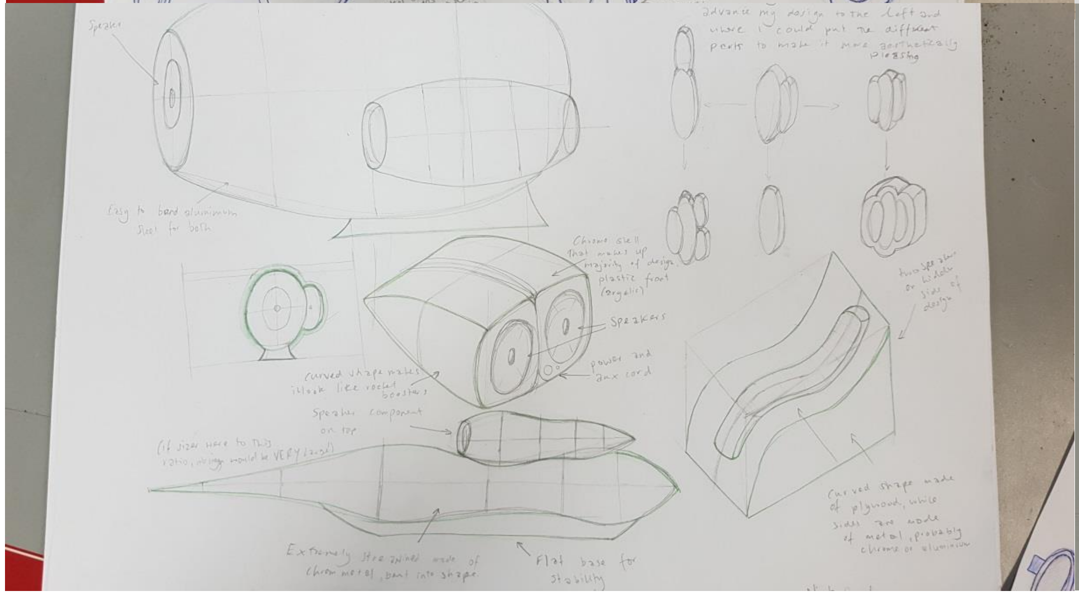
This box is pretty simple and self explanatory and is useful for holding small items,however this could be made easily at home for a DIY and does not need to be ordered or delivered unless buying in batch . it fits together with folds to make the 3D product.

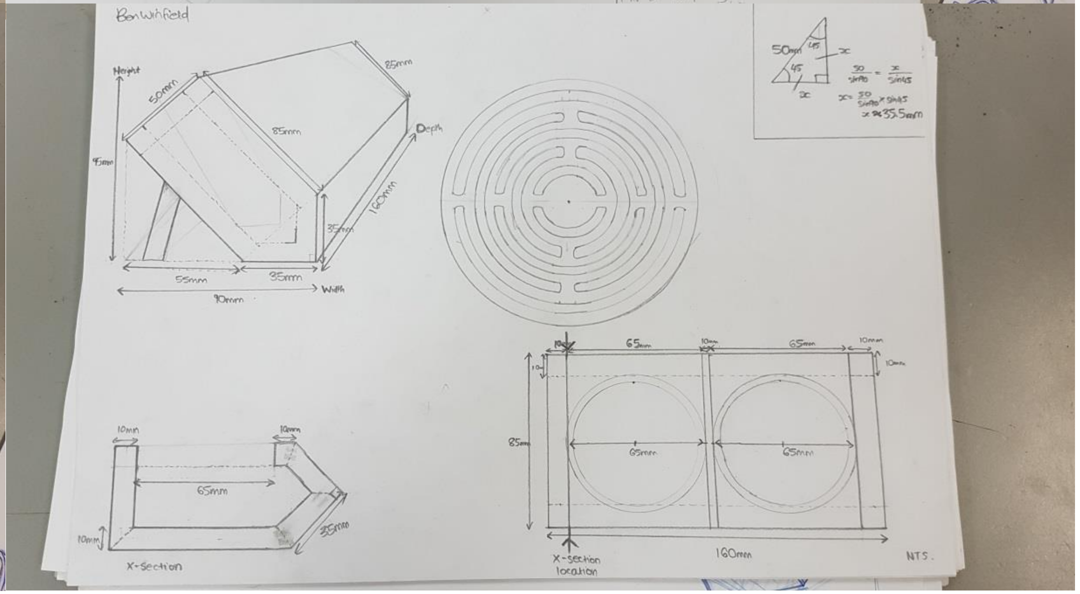
This chair is very creative as the parts that make the model chair spell chair. A drawback to this design is the sturdiness obviously as it clearly would be unable to hold any sufficient weight. This is a flat pack product as all of the pieces fit to make a flat pack product.

This lamp looks amazing and very cartoony which is fun however if the bub is too hot the cardboard is a fire hazard and the bulb looks large and like it would be unable to fit in the royal mail slot. This would fit together with only a few slots half way through the lap to fit together.


speaker inside the snail shell
place to put phone in
one speaker on each side made as small as possible so it can fit in bag or pocket
hexagon shape to make it interesting but also making it strong and secure
made of wood
thin as possible & small as possible so it is easy to fit into pocket/bag
fun exciting design aimed at children
made of plastic
pineapples are very popular with consumers at the moment
speaker under so you cant see them
fun exciting design aimed for children


Speakers on top and bottom of design
Speaker on both ends
Curved shape allows for ergonomic grip
Small access area to replace batteries
Aux and power button functions
Classic design using curved plywood and plastic top and bottom
Aux to replace batteries
power volume and aux option button
made of sheet metal with MDF front for a strong finish
1 side used for power and aux functions
4 sided shape that can balance on 3 of it's sides
Speaker on both ends of design
Two sockets that look like eyes but are the 2 speakers
Aux and power button

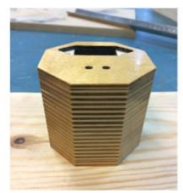

Speaker
Easy to bend aluminium sheet for both
Speakers
power and aux cord
Speaker component on top
Extremely streamlined made of chrome metal, bent into shape
Flat base for stability
Curved shape made of plywood, while sides are made of metal, probably chrome or aluminium


Ben Whitfield
Height
Depth
Width
50mm
85mm
35mm
160mm
55mm
90mm
65mm
10mm
X-section
X-section location
NTS.
x = 35.5mm

This is the final product of my portable speaker. I have met most of my specification which I made at the start of the project. For example, I used a modern design movement with black and white colour which most people in my survey prefered, which turned out well in my product. The manufacture cost of the speaker would not be over £20 because this product would probably be mass produce with injection molding with plastic which would bring down the cost of making. The simple design of this speaker would be suitable for most age groups which I intended to achieve in my specification. This speaker is portable and safe due to its small size as you can see from the image compare to the cell phone and it does not have any sharp edges in my design which makes this product child friendly. The battery can be replaced with a little force of pulling on the block opposite side of the bottom block and the battery could fit inside the aluminium cylinder. However, I did not achieve one of my specification by not using recyclable wood, this decision to use other materials was made to overcome the lack durability in the product if it was made with wood. By using metal and plastic, they add more style to the product and make it more durable.

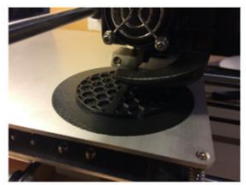
I was really happy with the final product. I thought that I kept to the design era really well and that this made it look like a professionally made product. if I was to make it again then I would give myself space to fit a grill on the front as I don think that the speaker is the most aesthetically pleasing thing to look at.

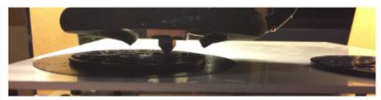
Making - amp - circuit



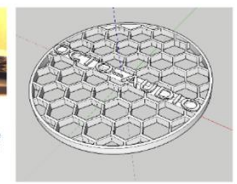
To make the amp casing i used 3mm plywood. The plywood layers were cut to their specific shapes using cad/cam and the laser cutter. The cad files where made on 2d design using the dimensions from the developed prototype and then exported as dxf. I then laminated the layers together using pva glue and and g clamps. But the two ends were not glued at this point. The next thing to do was the circuit board. I soldered the components onto the circuit board using a soldering iron and lead solder. The ends of the components legs were cut off using side cutters so that the circuit board was as neat as possible. Before the wires could be soldered on to the circuit i had to strip the protective sheving of the outside using wire stripers. The wires were then threaded through the holes in the plywood ends and soldered onto the circuit. The excess was then cut of again using side cutters. The power supply from the 9v battery was then soldered through the switch and then into the circuit board. I then glued the last two pieces of plywood to the rest of the amplifier box. Once the glue was dry i sanded down the sides to get rid of the scorch marks and then i varnish it with oil based varnish. 5 coats were applied and if there were any bumps in the layers they were sanded down using 800 grit sandpaper.

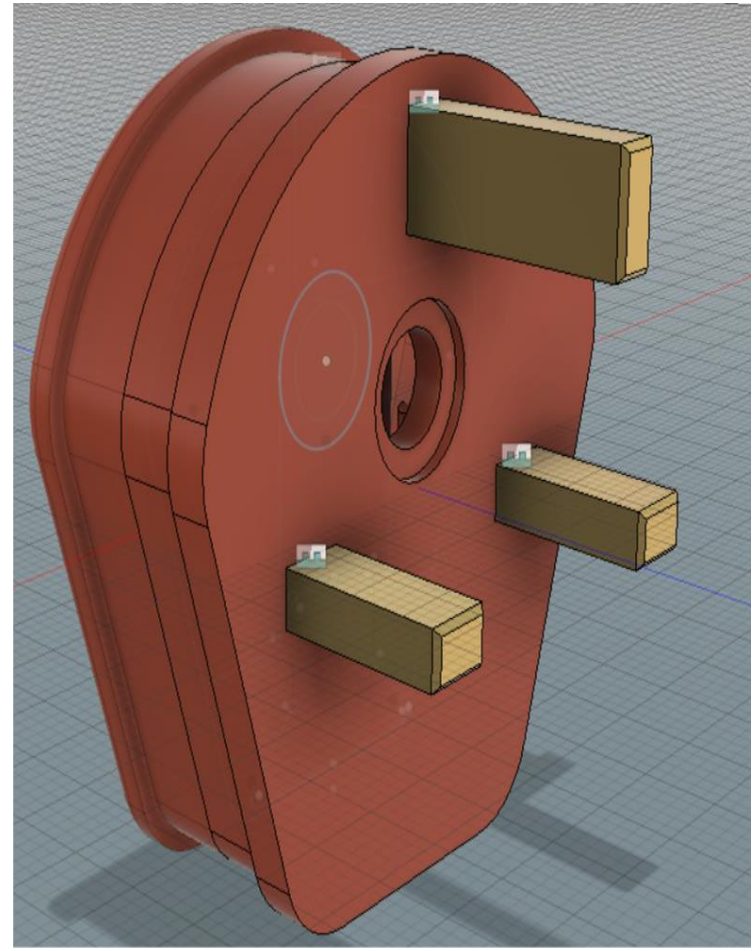
Making - speaker grills

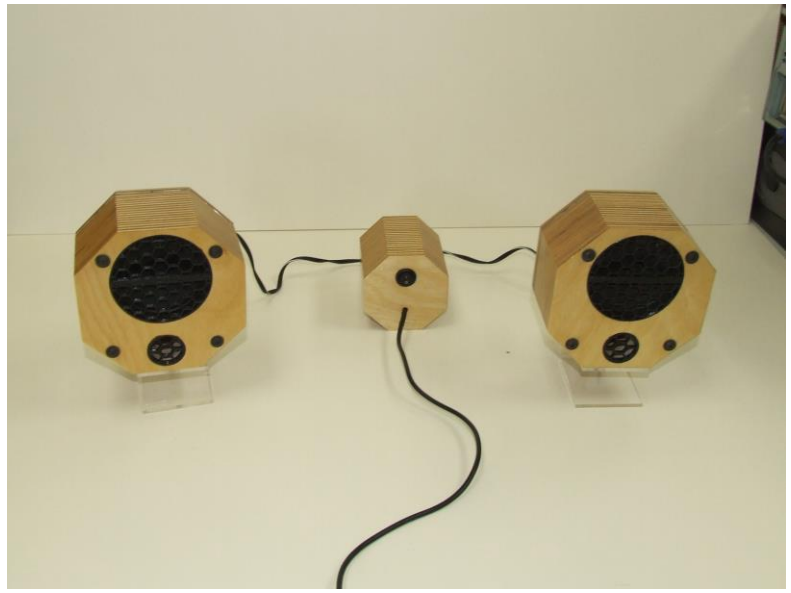




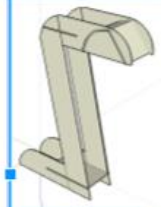
The speaker grills were made using cad/cam. The 3d model was exported as a stl file and imported into a 3d printing software. The printing speed, heats and layer height were then set to the required settings. In this case the grilles were made out of pla however other plastics like abs could have been used.

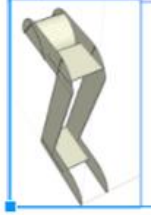






Initial design 1





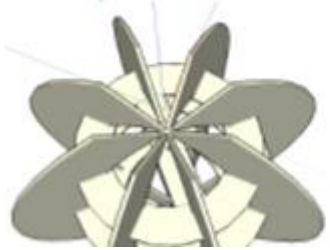
This design would be made of acrylic or plywood because it is easy to cut using the laser cutter which means that the slots would be much more accurate and the lamp would be more stable because of it. Also plywood and acrylic are very strong so would be unlikely to break or fold like grey board or card.

Using slots means that it can be assembled and disassembled again and again because it does not involve adhesive or anything else which permanently holds it together.

The light will be supplied by an LED strip powered by a USB which is flat enough to fit into the letter. Also it will enable you to power the light using a computer or laptop as well as a power pack.

The light will be reflected in the correct direction using a perspex mirror that will flex and locate into the curved slot in the acrylic or plywood. It will be cut out using a laser cutter and 2d design. The LED will be mounted to another piece of perspex mirror which will have slots cut using a laser cutter and 2d design.

Initial design 2



This design would be made from varnished plywood because it is much less likely to warp in the moist and wet environment of a kitchen or bathroom. It also i not likely to shatter if someone hits their head on it or drops it.

Slots will be used to hold it together because it allows it to be assembled and disassembled several times to change the bulb in it. It also means that it can be flat packed for shipping or for storage.

The lamp will use a standard bulb and fitting which means that they would not have to fit a different one to go with the shade.

The pieces would be cut out using a laser cutter or CNC router with 2d design because the slots would then be much more accurate meaning it would be much less likely to fall apart and injure someone or break during the fall.

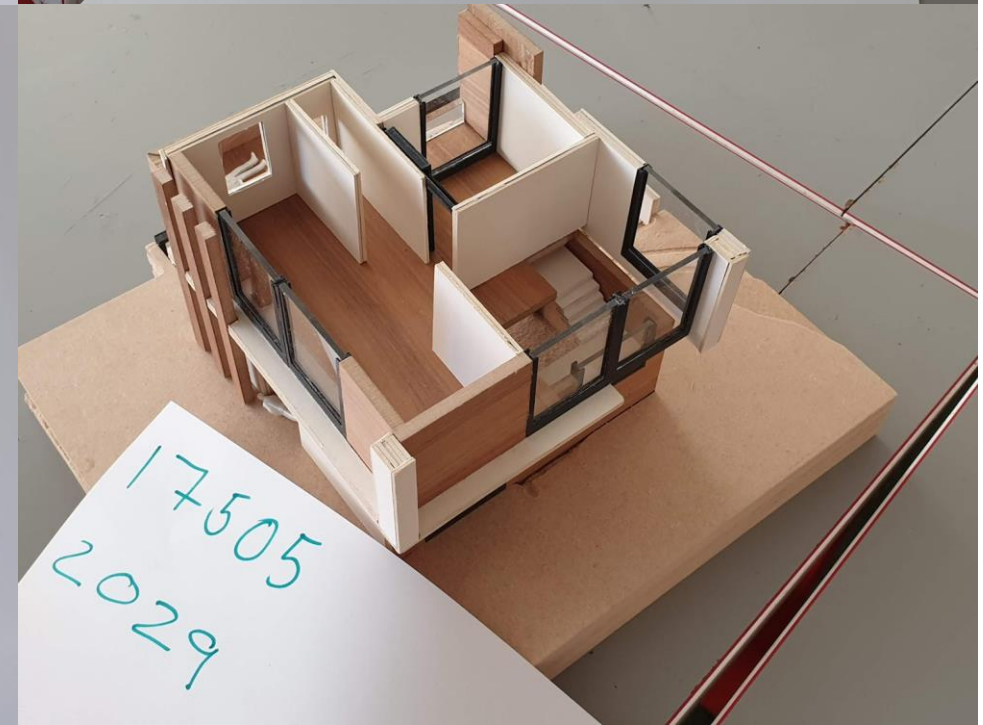
Using CAD/CAM also means that it would be much easier to mass product the product.

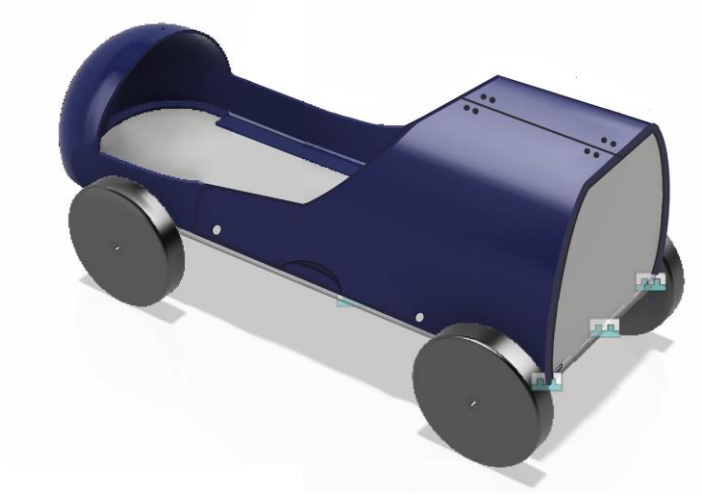
Prototypes

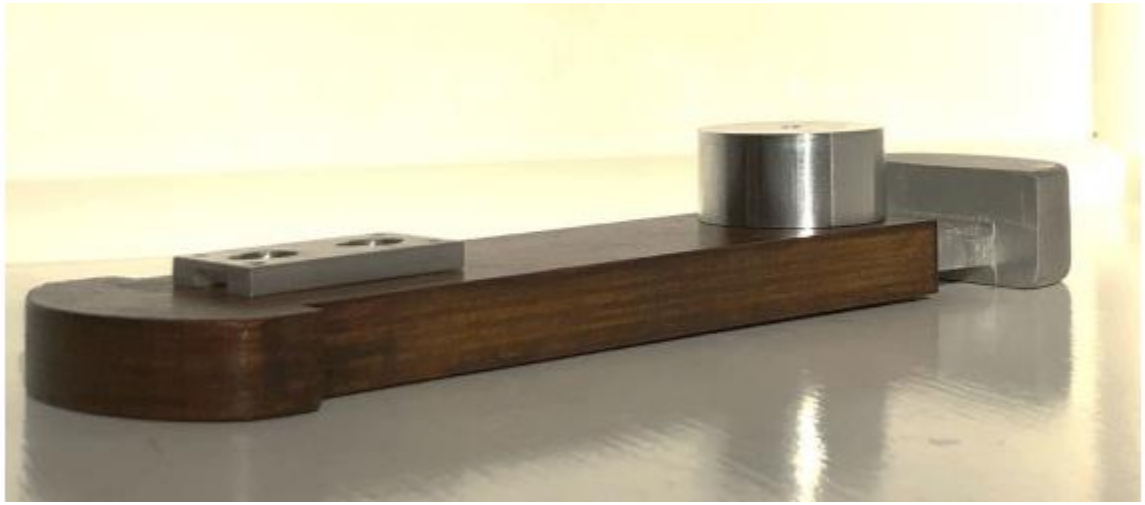
For the first one,I used push pins to show how the items would be held and I used a stanley knife,a cutting board and some card to create the frame of the holder.It is a holder for smaller items like nail varnish pots and small desk items.The prototype was made with two triangle pieces and four rectangular pieces (different sizes for smaller and longer parts of the shape format). This idea would be a mini stand for small objects but it would need backs on all of the rows that would make the design to heavy on one side without adding extra layering on the other side to even it out.

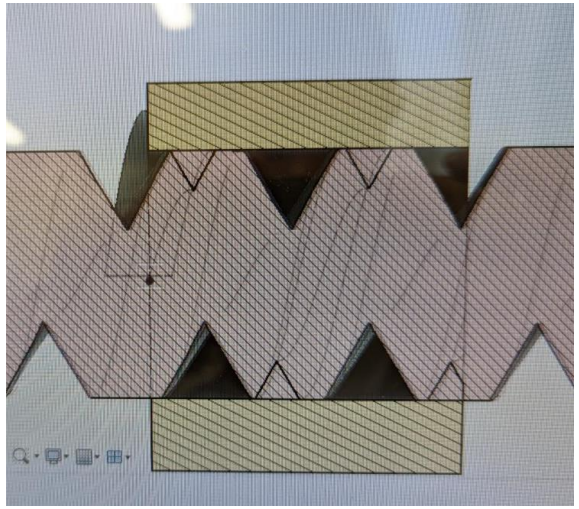
The second prototype is a candle holder that holds tealight candles. It is made from two semi circle parts with opposing slits to slot together and a cut in the top that is the size of a tealight candle.This is a simple version of the possibilities , it could have laser cut designs or holes on the side to make a more creative design and it is very simple, but it is also effective and does what it needs to do.Between both prototypes I prefer the second one as it is more focused on a flat pack product rather than just slotting pieces into each other-also it is more complex and individual than the other idea.i would also adapt the second design to hold more candles and be more useful than this idea.

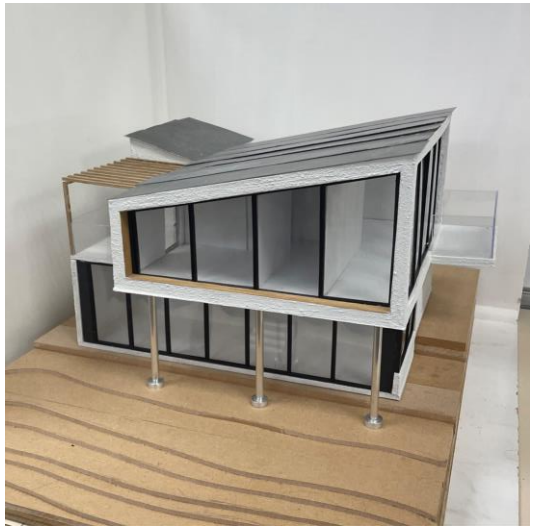

17505
2029


17505
2029









Brunel University London

Loughborough University

THE GLASGOW SCHOOL OF ART

UNIVERSITY OF LIVERPOOL

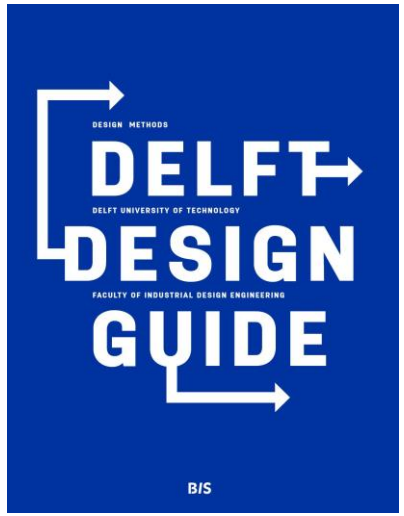
Plowman Craven

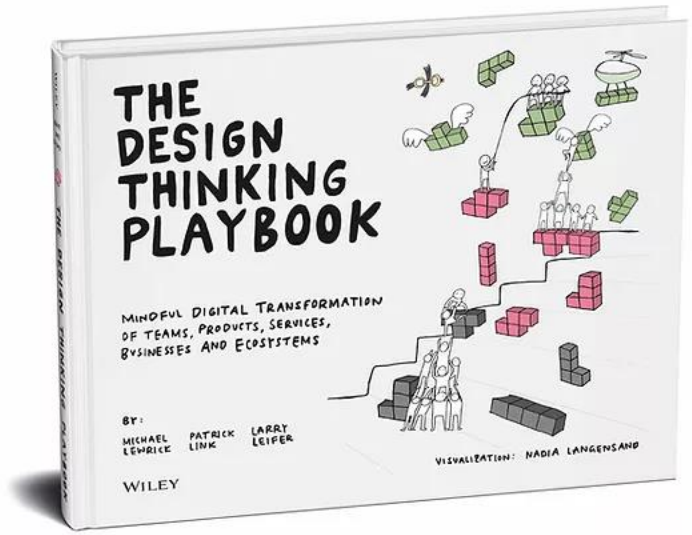
Middlesex University London

TRIUMPH DESIGN AWARDS

London South Bank University

EST 1892


DESIGN METHODS
DELFT
DELFT UNIVERSITY OF TECHNOLOGY
DESIGN
FACULTY OF INDUSTRIAL DESIGN ENGINEERING
GUIDE
BIS


THE DESIGN THINKING PLAYBOOK
MINDFUL DIGITAL TRANSFORMATION OF TEAMS, PRODUCTS, SERVICES, BUSINESSES AND ECOSYSTEMS
BY:
MICHAEL LEWRICK
PATRICK LINK
LARRY LEIFER
VISUALIZATION: NADIA LANGENSAND
WILEY


Stuff Matters Mark Miodownik

Engineering drives productivity

Engineering generated **£455.6 billion** GDP for the UK

That's **27.1%** of the total UK GDP

Engineering is **68%** more productive than retail

Employment has grown by **1.8%** to over **5.5 million**

Engineering supports **14.5 million jobs** – 55% of UK employment

The number of registered engineering enterprises **grew by 5.6%** in the UK to 608,920

Every time **a new job** is created in engineering, **two more jobs** are created elsewhere

...but we need many more engineers

Engineering companies are projected to need **182,000 people** with engineering skills each year to 2022

We need to **double the number of graduates and apprentices** entering the engineering industry

Filling the demand for NEW engineering jobs will generate an **additional £27 billion** per year from 2022 to the UK economy – equivalent to **building 1,800 schools or 110 hospitals**

We need more young people studying STEM subjects

Of a cohort of 1,000 11-year-olds:

111 boys and **101 girls** will achieve a physics GCSE A*-C or equivalent

44 boys and **13 girls** will achieve a physics A level or equivalent

21 males and **3 females** will obtain an E&T degree

33 people will achieve engineering-related **advanced apprenticeships**

From 2011 to 2015 the proportion of 11-14s who believe that **a career in engineering is desirable** has increased from **27%** to **43%**

Almost **3 in 4** parents believe that a career in engineering is desirable for their children

...and the proportion that **know what engineers do** has increased from **11%** to **30%**

But there is more to do...

2 in 5 STEM teachers feel confident giving careers advice about engineering, including **47% of men** and just **28% of women**

1 in 4 parents knows what people working in engineering do

17- to 19-year-olds **underestimate** the average starting salary of a graduate engineer **by 27%**

Great prospects

The average graduate starting salary for engineering and technology is **£27,079** – over a **fifth more** than for all graduates

Nearly two thirds of employed engineering and technology graduates work for an engineering and technology employer

Just **one in fifty** go into the financial and insurance sector

GRADUATE JOBS

WHICH DEGREE COURSES ACTUALLY LEAD TO JOBS? THE STATISTICS SPEAK FOR THEMSELVES

Degree Subject	Employed	Most Popular Employment	Relevant KS4 courses
Design	83.8%	Design Professionals, Media, Marketing, Business (41%)	Design & Technology, Maths and Science
Hospitality & Food	81.0%	Retail, Public relations, Sales (25%)	Food Preparation and Nutrition, and English
Architecture	79.9%	Engineering and building professionals, architects. (44%)	Design & Technology, Maths, Physics, Chemistry.
Media Studies	78.0%	Retail, catering, waiting and bar staff (24%)	BTEC Media and English
Civil Engineering	76.6%	Engineering and building professionals (73%)	Design & Technology, Maths, ICT, Physics, Chemistry.
Business and Management	75.9%	Business, HR, and finance professionals (23%)	ICT, Maths and Computing Science
Computer Science	75.8%	Information technology professionals (58%)	Computing Science and Maths
Mechanical Engineering	75.2%	Engineering and building professionals (64%)	Design & Technology, Maths, ICT, and Physics
Electrical Engineering	73.6%	Engineering and building professionals (38%)	Design & Technology, Maths, ICT, and Physics
Performing Arts	73.5%	Arts, design and media professionals (29%)	Art, Drama, Music
Art	70.2%	Arts, design and media professionals (27%)	Art, Textiles
Sociology	69.8%	Retail, catering, waiting and bar staff (21%)	Religious Studies, PD
Sports Science	69.5%	Other professionals and technicians (22%)	Physical Education, ICT, and Biology
Economics	65.4%	Business, HR and finance professionals (54%)	ICT, Maths
Geography	63.4%	Business, HR and finance professionals (20%)	Geography
Languages	62.4%	Business, HR and finance professionals (17%)	German and French
English	61.9%	Retail, catering, waiting and bar staff (19%)	English
History	59.9%	Retail, catering, waiting and bar staff (19%)	History
Mathematics	55.8%	Business, HR and finance professionals (40%)	Maths
Biology	55.0%	Retail, catering, waiting and bar staff (20%)	Biology
Law	52.9%	Legal, social and welfare professionals (28%)	English
Chemistry	52.7%	Other professionals and technicians (19%)	Chemistry
Physics	46.7%	Business, HR and finance professionals (18%)	Physics

Data taken from Higher Education Careers Service (HECSU) and Prospects 2014 leavers desitination survey of UK universities.
Architecture and Civil Engineering are by all measures the most employable career choices and also some of the highest paid.