

What is ENGINEERING?

Learning objectives:

- What is A Level Design & Technology: Design Engineering?
- What does the course involve?
- What career pathways are there from Engineering?



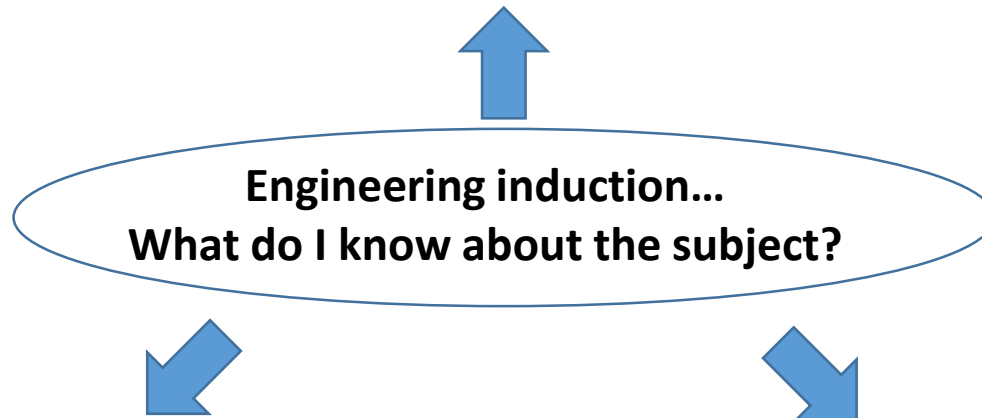


Design & Technology – Starter



PLEASE SIT DOWN IMMEDIATELY & WORK IN SILENCE

What is Engineering?



What skills does an
Engineer need?

What are the job roles
in engineering?



Learning objectives:

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Learning objectives

- What is A Level Design & Technology: Design Engineering?
- What does the course involve?
- What are the career pathways from Engineering?
- What will happen at the start of the course?
- What can I do to prepare for the course?

Key words:

Linear course,
specification,
NEA (Non Exam
Assessment),
independent,
Client brief,
portfolio,
prototype



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What are the course details?

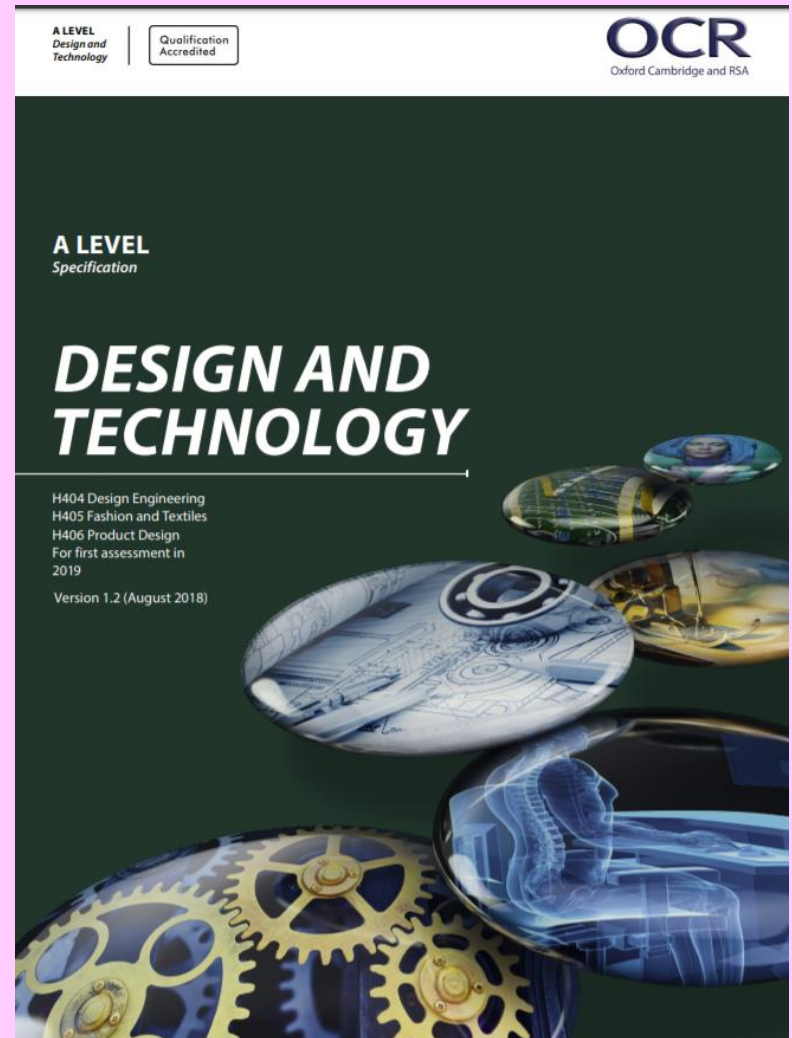
OCR

A Level

2 year course

Linear

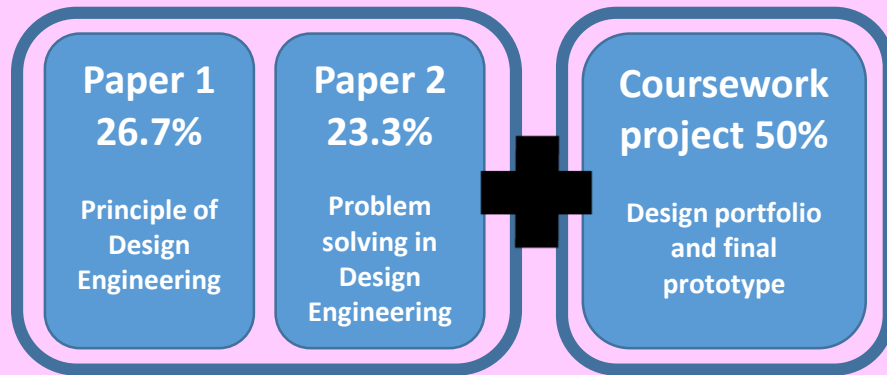
<https://www.ocr.org.uk/Images/304609-specification-accredited-a-level-gce-design-and-technology-h404-h406.pdf>



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What does the course involve?

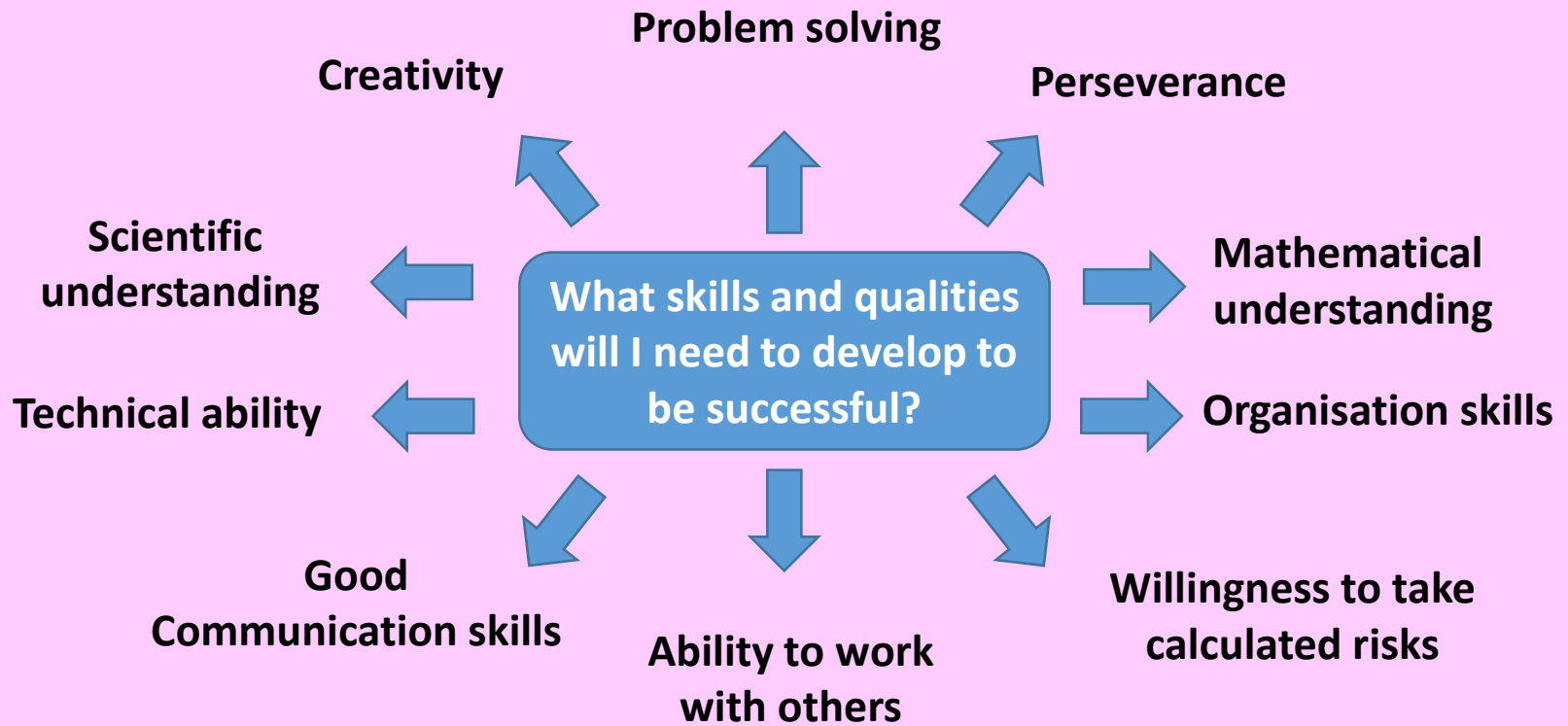


Content Overview	Assessment Overview	
<p>This paper is set out through four sets of questions that predominantly cover technical principles within each endorsed title. Learners will be required to:</p> <ul style="list-style-type: none"> analyse existing products demonstrate applied mathematical skills demonstrate their technical knowledge of materials, product functionality, manufacturing processes and techniques demonstrate their understanding of wider social, moral and environmental issues that impact on the design and manufacturing industries. 	<p>Principles of... (01)</p> <p>80 marks</p> <p>1 hour 30 minutes</p> <p>Written paper</p>	<p>26.7%</p> <p>of total</p> <p>A Level</p>
<p>This component has a series of longer answer questions that require learners to demonstrate their problem solving and critical evaluation skills. Learners will be required to:</p> <ul style="list-style-type: none"> apply their knowledge, understanding and skills of designing and manufacturing prototypes and products demonstrate their higher thinking skills to solve problems and evaluate situations and suitability of design solutions. 	<p>Problem Solving in...* (02)</p> <p>70 marks</p> <p>1 hour 45 minutes</p> <p>Written paper</p>	<p>23.3%</p> <p>of total</p> <p>A Level</p>
<p>The 'Iterative Design Project' requires learners to undertake a substantial design, make and evaluate project centred on the iterative processes of explore, create and evaluate.</p> <p>Learners identify a design opportunity or problem from a context of their own choice, and create a portfolio of evidence in real time through the project to demonstrate their competence.</p>	<p>Iterative Design Project* (03, 04)</p> <p>100 marks**</p> <p>Approx. 65 hours</p> <p>Non-exam assessment</p>	<p>50%</p> <p>of total</p> <p>A Level</p>

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Click on the career pathways below to follow the link to more job roles and additional information online.



Maintenance
Engineer

Automotive
Engineer

Structural
Engineer



CAD technician

Electronics
Engineer

Design
Engineer

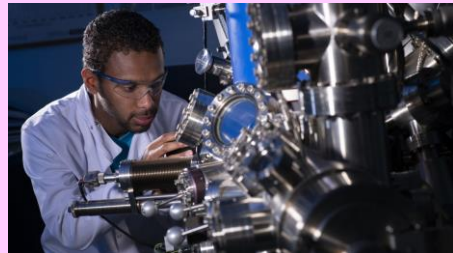
Civil
Engineer



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Learning objectives:



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What is engineering?



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What will I do over the two year course?

Year 12

Year 13

Coursework project (50%)

Final exams (50%)

Coursework project

Research, design, development, modelling and planning

Coursework project
Product manufacture, testing & evaluation

Paper 1
26.7%
Principle of Design Engineering

Paper 2
23.3%
Problem solving in Design Engineering

Preparing for the exams...

Identifying requirements

Learning from existing products and practice

Implications of wider issues

Design thinking and communication

Material and component consideration

Technical understanding

Manufacturing processes and techniques

Viability of design solutions

Health and safety



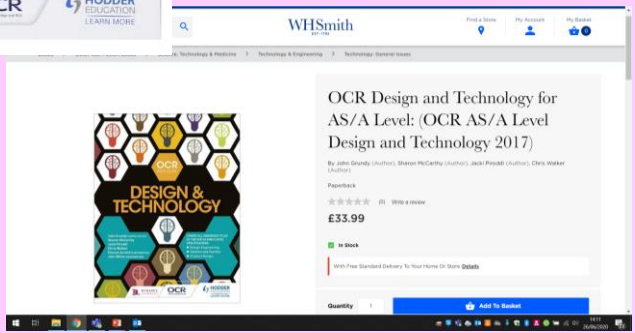
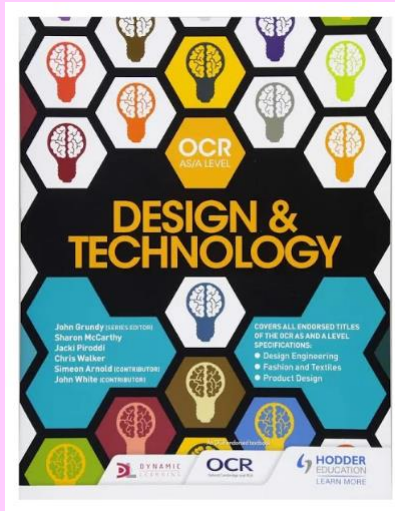
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What resources will I need during the course?

Textbook – Price to be confirmed (approx. £16)

Contributions towards materials and components £20



Monday 7th September 2020

Dear Parent/Carers

As you are aware your child has begun his/her A Level studies in Design Technology: Product Design. As a department we endeavour to provide engaging final coursework projects that have historically given the students excellent coursework grades.

As part of their final A Level coursework project they will be designing and manufacturing a final product that your child will get to keep and take home.

Our department budget is sufficient to cover the costs of the basic materials and consumables necessary to deliver the course but, in order to enhance the curriculum and provide more stimulating and relevant projects we ask for £20 from each student for each examination course they follow within our subject area to cover the cost of the specialist materials and components they will be using.

In addition it is a requirement of the course that all students have the endorsed textbook which retails at £32.99. However, we will give each student a textbook but request an additional £15.00 to cover the cost of supplying these and require the students to return the books at the end of the course.

To summarise...

DT contribution towards materials and components	£20
Textbook loan/contribution	£15
Total	£35

(Students who study both Engineering and Product Design would need to contribute for both)

Contributions can be paid via Parent Pay. Unfortunately, we cannot accept contributions in the form of cash or cheque.

Yours faithfully

Mr Hill



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Core Expectations for **Every Lesson**

1. Attend lessons on time and in professional attire
2. Be prepared for each lesson by ensuring you bring the appropriate equipment
3. Ensure all work is organised in the appropriate section of your subject folder
4. All deadlines must be met to avoid a 6 week “Risk of Failure” program
5. Respect the classroom, Replace chairs, Rubbish in bins
6. Speak to **ALL** members of the HT community with respect
7. No mobile phones/ear pods to be used in lessons or around the school
8. Starters are to be completed in silence
9. Be proactive and not reactive
10. Expect to work harder than you ever have before



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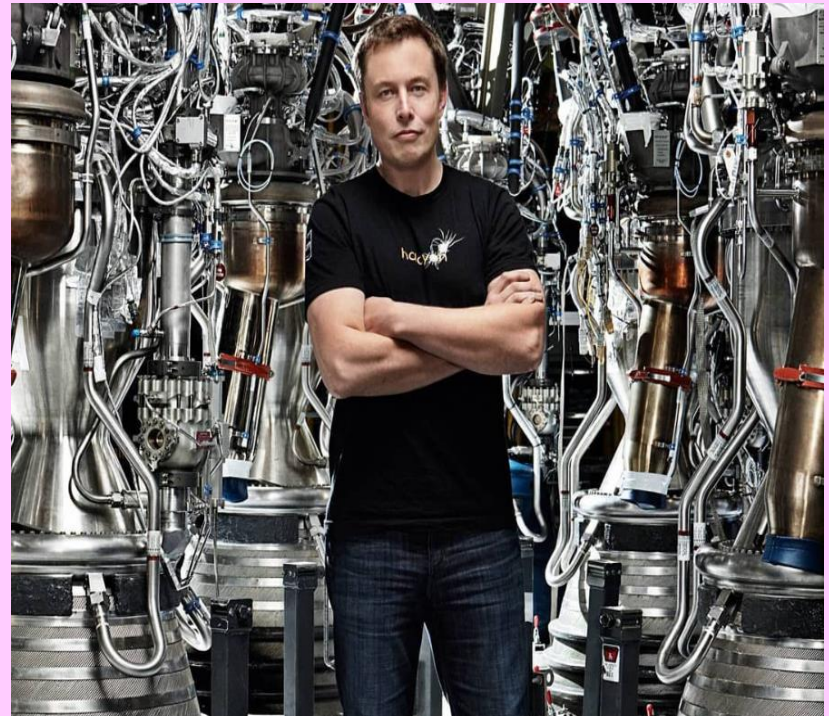
What can I do to prepare for the course?

Learning objectives:



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Do you recognise this famous Engineer?



INTERNET LINK

VIDEO LINK



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Design & Technology – Starter



PLEASE SIT DOWN IMMEDIATELY & WORK IN SILENCE

Who is this famous Engineer?

What challenges has he faced?

What are his achievements?

What do you know about his journey to success?



What products has he developed?

Have all of his ideas been successful?

How did they start their journey to success?

What do you know about the organisations he has established?

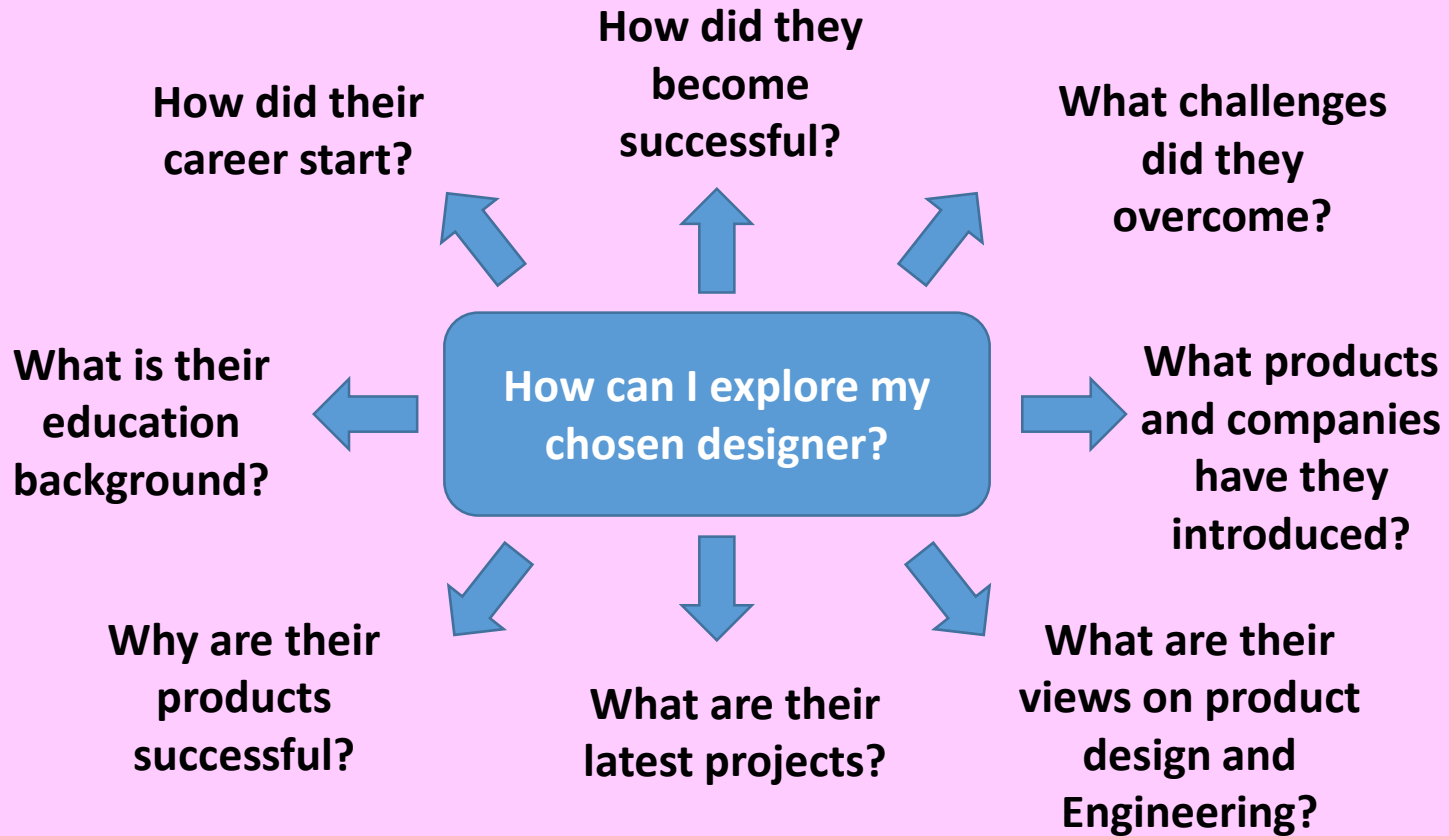
A Level Product Design summer preparation task

-Many people have heard of the well-known Engineer and entrepreneur Elon Musk and may have used some of the popular products and companies he has become famous for introducing to the world. You are required to carry out research on Elon Musk to gain an understanding his background of Engineering and Design that has led to his success...



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How can I prepare for my coursework project?

Learning objectives:

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Explanation

What do we need to include on page 1?

- You will need to identify three possible themes/areas of interest.
- Present a summary of the research you have carried out.
- For each area identify a client/stakeholder.
- Explore possible situations/problems for each area you have outlined

Possible section headings...

- What theme areas have I explored? (at least 3)
- What have I learnt from my initial research? (summary of findings)
- Who are the potential clients/stakeholders?
- What problems/situations have I identified within each theme?
- Which theme will I focus on?



Learning objectives:

- What themes are available?
- What do you need to consider?
- What makes a top introduction page?

Homework

As part of your homework give the first page of your coursework project a go.

- Look at the examples sheet
- Consider your three themes
- What problem could you solve?
- Who would your clients be?
- Who would you talk to?
- Where could you look/go?
- What do you need to find out?

Project Introduction
Introduction
On this sheet I am going to be doing a mind map of the different themes I can explore and then I am going to be going to exploring 3 themes I could potentially go into and look into different problems I currently know about with each of the themes

Why am I looking into these 3 themes.
The main reason I am looking into these 3 themes is because of the scope I feel like each of these have and the large amount of gaps in the market within each of these themes, another reason is because I have personally had problems with products in these themes or I have close relatives that have problems with these themes

Technological products
I am really into technical products and I feel like there is some big gaps in the market for different products, this market is mainly aimed at teenagers and adults, more technology is going towards working and everyone is now doing work online instead of a traditional pen and paper. Everything is being pushed lately to be smart and for everyone to have a smart home and there is a very popular demand for making everything smart now and I feel like this would be a good option to turn something which is not smart and technological and turn it smart and a modern product, like a table these are still very primitive for modern technology and have not been modernised, some company's are starting to put new technology but these products are very expensive and they do not always work. I feel like there would be scope for a table which has built in speakers which has wireless charging built in, many big company's like apple and Samsung are using wireless charging for their phones and I feel like the unique selling point of a product like this would be the wireless charging.

Pets products
This would be a good option for my theme because there are a lot of families that own pets and this is a very wide market with a lot of potential, from young kids to elderly. This is a wide market of estimated 51 million pets in the UK, this is a huge market and 26% of this 51 million are dogs which is going to be a good market because this hasn't evolved across the years and is very traditional for the pet owners to manually feed the dogs and can be easy for clients to forget or not be in to feed the dogs so some clients might need to schedule there day around needing to feed their pets, another problem with pets is elderly people forgetting or not being able to feed their pet so other family members might need to come round twice a day to feed the elderly persons pets and can become a problem for elderly if they cannot do it themselves or get other people to feed their pet, one opportunity I have noticed is a automatic food dispenser which can store the food and then there could be a button to press or a wireless connection that can be worked from a distance which would be possible for people with busy lives or for elderly people who cannot remember or not capable to keep on feeding their pets. I also feel like that is a huge gap in the market for products that keep pets fit and healthy when the owners are away and are not able to make sure there pets are keeping healthy one of the biggest pets that get neglected is fish this is because not everyone gets others to feed there fish when they go away and then the fish are unhealthy and underweight

Gardening products
This is also a wide market and has a lot of scope and potential for different products because I feel like this is looked over and doesn't have enough products that make gardening easier for people this is especially for the elderly because trying to reach the high branches is hard and sometimes they are not capable to do it and could potentially become a health risk for them to do the gardening, another reason for this is because of how dangerous some of the products are like a chainsaw, hedge trimmers and sickles can be very dangerous for elderly to use and can be dangerous to use around kids and animals. 87,000 people were injured using gardening products and this number is too high and I would want to make a product that is making gardening safer for people. Another opportunity that I have noticed is making gardening products inclusive for kids teenagers and the elderly this is a large potential market that is neglected from gardening designers and I feel like there would be a lot of scope and opportunity for making a product is interchangeable for making different products easier for these people to do gardening, this would make it more enjoyable for the people to do gardening and make it a lot easier for them especially for elderly people because they become restricted and not able to do everything independently. I have shortlisted this theme because of the lack of products that are available for elderly people.

What's next
On the next page I am going to be deciding on my chosen theme for my project, I will be looking into initial stakeholders and potential clients I can contact so I can quickly get some advice or help with the market so I can understand it better and get a better understanding on the problems clients currently have with products and to also see where stakeholders think there are gaps in the market for new or a better product. I am also going to start doing my research on current products on the market so I can get a better understanding on what products are already successful and to see where the gaps in the market are, I am also going to be looking into current trends in the market so I can look into what trends I can put into my product



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RESEARCH THEMES

Trends:

There has been a trend in using technology to improve and guide sportsmen when playing. For example. The use of fit bits have increased, these count peoples steps and heart rate and gives results on the activeness and fitness of the user.

Types:

- Football
- Tennis
- Golf
- Dance
- Rugby
- Basketball
- Extreme Sports

SPORT

Problems with Outdoor Living:

- Lots of enhancing equipment is expensive
- Some equipment may not fit all needs
- Grips on bats/clubs are not adjustable or they do not have enhancing features.
- People struggle to practice accuracy.

Further Research on the topic:

I could go to store and look at existing products for outdoor living and the advantages and problems with them.
I could also visit local sport clubs such as golf clubs or football teams and ask about problems that they have.

Potential Stakeholder/Client

I spoke to a number of people at three local golf clubs. They listed a range of issues that they have surrounding the sport, for example, struggling to putt accurately.

I also spoke to a football coach, at the local club and he highlighted that there were a few areas where a device or product could improve and assist him when coaching. It appeared to him that a number of coaches are using technology to improve their players performance. He suggested that a product could be made to enhance the accuracy when striking the ball.

Research Opportunities

I will need to go to stores as well as clubs to see what products are already existing which improve the way sports are played. I could go to American Golf, Lily Whites, Sports Direct, Go Outdoors, Inter-Sport.



Trends

- Small houses/ apartments
- Furniture
- Space saving products that fold into each other or stack in certain ways to save space.

Types:

- Indoors**
e.g. chairs, stools, desks, storage units
- Outdoors**
e.g. chairs, tables, storage units

COMPACT FURNITURE

Problems with Compact Furniture:

- Price of existing products that have a high quality function are highly priced.
- There are already a large variety of existing products therefore, a gap in the market may be difficult to find and fit.
- The quality of existing products may be low quality, therefore people do not purchase them.

Further Research on the topic:

I could go to look at existing products for compact furniture, this could be don't by going to well known stores such as Ikea which sells flat pack and compact furniture.
I could also go to a variety of stakeholders that have issues occur with purchasing furniture due to the lack of space for them.

Potential Stakeholder/Client

I have spoken to a family member who lives in a small apartment, they said they find it difficult to furnish their apartment as there is a minimal amount of space and most furniture is made for houses with a larger area for furniture. He has stated that there has been a rise in compact furniture, however the majority of the products that exist, for example beds that drop from walls are very highly priced. He said it would be ideal to have space saving furniture that doesn't cost a large amount of money.



More Options
Increase, Horizontal Wall-Folding Bed by Brooklyn Studio
from £676.66
or as low as £58.28/month
FREE Delivery

Research Opportunities

I will need to visit stores which sell compact furniture, this will give me an idea of the existing products and who they are mainly aimed at. A perfect opportunity to get this information, is to visit Ikea, this is because it is a home furnishing store that sells compact and flat pack furniture.

I will also go to other stores that stock compact furniture as this will give me a wider variety of research.



More studio apartments and dorms are being used by people, these have small areas and minimal space for furniture. Therefore, this is an opportunity to branch into as there is a lot of scope to create a product to suit the need of a compact furniture; that is suitable for this type of room/ apartment.

Types:

There are a range of kitchen utensils that are used regularly, however, the elderly struggle to use different utensils as they require a lot of strength.

Trends

- More products are being produced to assist the elderly with using kitchen utensils.

KITCHEN UTENSILS FOR THE ELDERLY

Problems with Compact Furniture:

- Existing products are expensive, which means the elderly will not purchase them.
- There are not a large number of fully functioning products that help the elderly.
- The quality of existing products may be low quality, therefore people do not purchase them.

Further Research on the topic:

I could look at tools which exist to make the action, for example chopping, easier for the consumer. I could also find out what the elderly struggle to use.

Potential Stakeholder/Client

I could speak to family members, who are elderly, about the problems that occur when using equipment in the kitchen. I could also look at products that are around for people who are elderly or suffer from illnesses, such as arthritis or Parkinson's.



Research Opportunities

I will need to go to shops that have products that aid the elderly or people with illnesses when in the kitchen. I will need to find the advantages and disadvantages on these existing products. I will also need to see if there is an opportunity to fill a gap in a market with a product.

I will also need to research the clients needs or areas that they could give improvements to on existing products.