

# CAREERS

## INFORMATION AND GUIDANCE

**A Level Design & Technology**



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# Skills Development in Design Technology

Key skills gained: critical thinking, creativity, technical drawing, and CAD software.

The importance of these skills is very desirable for various career paths and higher education.

The top 5 skills employers look for that you'll learn in Design Technology

- Creativity
- Problem-solving
- Communication
- Researching
- Adaptability

**Product Ideas: Further Development: Idea 2**


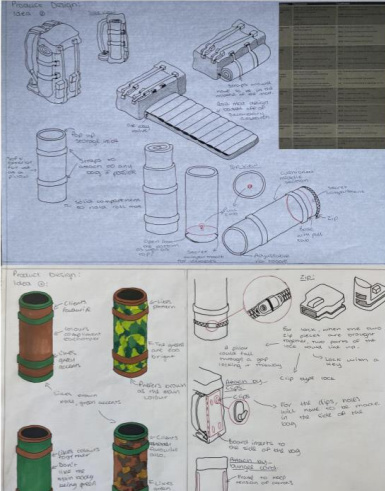
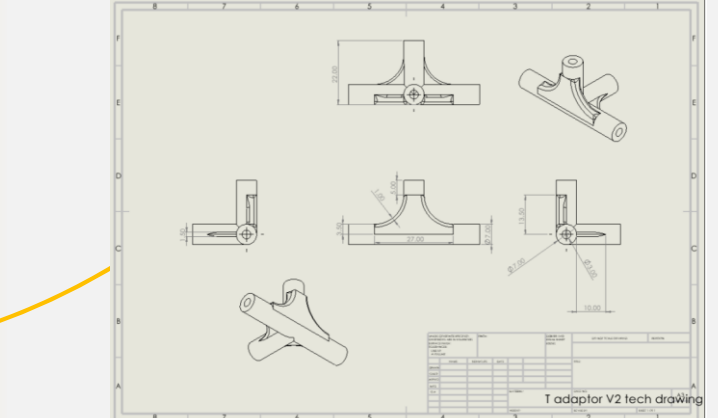
**Idea 2: Base Concept:**

- Compartment that can attach to one side of a DofE bag which holds a self-inflating roll mat, and the bag can be used as a pillow.
- Alternative idea to make a compartment that is based on the same general idea, a bag with a built-in compartment with an opening where the roll mat comes out.
- The compartment can alternatively be used as storage on the inside and the compartment could be padded on the outside to turn it into a pillow.

**Justification**

This product will be made to combat the struggle my client has with night-time comfort, this product will specifically tackle his main problem of sleeping at night. This product will achieve this by making my clients roll mat more accessible and having the casing for the roll mat double as a pillow. Having the roll mat more accessible will make it easier and faster for my client to get to bed at night-time, therefore increasing my client's night-time comfort. The roll mat casing also stops the roll mat from getting wet if it rains, keeping it fresh for when it needs to be used.

**Existing Product Breakdown and Initial Ideas / Sketches:**


**Product Prototyping:**

- How the model helps
- Issues
- What I would do next time
- Clients input and feedback

**How the model helps**

These models help me and my client to better visualize how the final model will look and function. The model also helped by bringing the concept from a page to a real model.

For my next model on CAD such as solidworks, I will add different colours and textures to the 3D model to better match my clients preferred design style.



**What I would do next time**

**Main Base:**

If I were to remake the main base of my prototype again, I would leave a gap on both sides for the 'lock' to go through so that the lids can be more secured down. I would also not go as deep when cutting in the slits and I would also try to make sure they were all uniform in depth so that the bases curve more smoothly and the main structure is more rigid. Finally, I would also make the base have a larger internal radius, but I would keep the height the same to make the roll mat fit in easier as this prototypes radius is too small for the height.

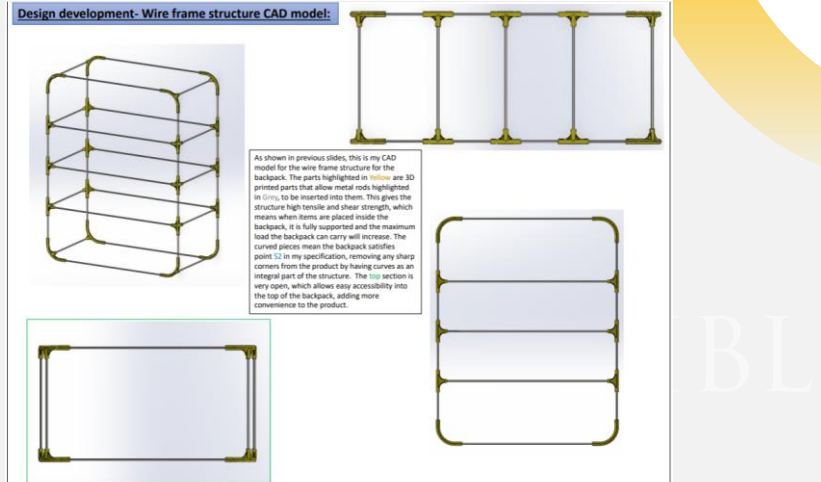
**Lids:**

For the lids, if I were to remake them, I would make the starting cardboard squarer so that the top and bottom are flatter. I would also make them bigger to fit into the new bigger base. For the openable base I would include more rubber bands on the interior, possibly one on the top and one at the bottom, sides so that the two halves are pulled together better. For the track lid I would make a stronger handle and make the tracks smoother by making the adjustable floor more circular by using the bandsaw.

**Issues**

- Not as circular as I used a craft knife rather than bandsaw
- Cut the slits too deep
- Didn't leave a gap for the locks on either side
- Initially cut the base too small so the model was too tall for the width
- When making expanding lid I didn't account for the foundation, so it is taller than the other lids

**Design development- Wire frame structure CAD model:**



As shown in previous slides, this is my CAD model for the wire frame structure for the backpack. The parts highlighted in yellow are 3D printed parts that allow metal rods highlighted in blue to be inserted into them. This gives the structure high tensile and shear strength, which means when items are placed inside the backpack, it is fully supported and the maximum load the backpack can carry will increase. The curved pieces mean the backpack satisfies point 5 in my specification, removing any sharp corners from the product by having curves as an integral part of the structure. The blue section is very open, which allows easy accessibility into the top of the backpack, adding more convenience to the product.



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# Career Opportunities

Potential career paths:

Links to industries such as fashion, automotive, and creative technology.  
 Further education opportunities (e.g. University courses in Design, Engineering).

## TOP 5 REASONS WHY YOU SHOULD BECOME AN ENGINEER

- Engineers have the opportunity to contribute to their communities, countries & civilisations by making tools & machines to help people improve their lives
- Engineers are in demand. There is a growing skill shortage of trained engineering workers across all sectors
- Engineers are problem-solvers. They use a range of skills in maths and science, communications, critical thinking and management to find practical solutions that benefit people and society.
- There are several training routes available for professional engineers at all levels, such as apprenticeships which provides work-based learning, the university route to gain a degree and the vocational route through college courses.
- Growing skill shortages across many sectors are generating higher graduate salaries and other benefits

• Interior Designer	• Design Engineer
• Product Designer	• CAD engineer
• Video Game Design	• Electrical Engineer
• Civil Engineer	• Sound Engineer
• Mechanical Engineer	• Architect
• Robotics Engineer	• Steel Fabricator
• Aeronautical engineer	• Electrician
• Joiner	• Surveyor



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Did you know?  
 19% of the UK's total workforce is employed in the engineering sector.

Anything is

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# WHERE CAN I FIND OUT MORE?

- Contact information [djones@st-hildas.co.uk](mailto:djones@st-hildas.co.uk)
- AQA Alevel Design and Technology: Product Design 7552

[Link to AQA A Level DT](#)



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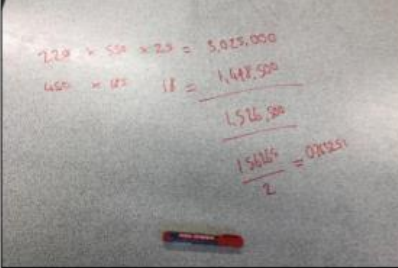
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# Enjoyment and Engagement

Practical, hands-on learning experiences.

Creative freedom to develop original designs and projects.

Collaboration with peers on design challenges.




$220 \times 550 \times 25 = 3,025,000$   
 $450 \times 185 \times 18 = 1,498,500$   
 $1,526,500$   
 $\frac{1,526,500}{2} = 763,250$

whole container inside:  
220x550x25=3025000


volume taken up by positive mould:  
450x185x18=1498500


Amount of total silicone needed:  
3025000-1498500=1526500

litters amount of each part of silicone kit (1-1 mixing ratio):  
1526500/2=763251ml or 0.763 litres




my silicone you can see the exact measurements I had of each luckily 1mm of each component weighed 1 gram which allowed us to use digital scales to get an exact measurements but we also used black electrical tape to mark of the correct volume of each part






Here you can see the calculations I did to work out how much silicone we would need to fill the empty space in the mould each part of the mixing kit was half of the total as the ratio to mix was 1-1. I purposely had more than I needed just in case I lost too much as waste sticking to the side of the jugs and mixing bowls I used





At this point I had each part measured to the correct volume I had prepared every thing that I would need to cast the mould I started by pouring both the silicone and the hardener into a mixing bowl and began to stir using a silicone spatula I noticed that not all of each component would pour out and there was a great residue left in each measuring jug to solve this problem I used an acrylic strip to scrape along the edge of each to get it all out I then sat and mixed both components together well until they were completely combined with one another. Everybody involved with the pour was wearing PPE including a lab coat ( to protect clothing and shield most of the body) as well disposable gloves (this meant that any silicone spilt on hand would not set on bare skin




This is when I poured the mixture into the mould I had a similar problem to the jugs where not all of the mix would come out I used the same acrylic strip to scrape the mixture out. When I had gotten as much out as possible I turned on the power sander and slowly moved it around the edge of the frame vibrating it until it had set flat


After 3 hours the mixture had set and I was left with a solid flexible mould which I would be able to cast into a unique property of silicone is that once set you can cast anything in it and it will not stick this makes it the ideal material to cast silicone into to create the padding for the suspended bed





This is the first pour for the silicone padding





This is the first pad being removed from the mould and finished pads.



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# What Our Students Say

DT is interesting and enjoyable, you can be creative and make interesting products.

I really like the freedom to design and make products trying to improve on my previous designs.

I love problem solving and not giving up when challenges arise, I really want to be successful with my outcome.

I think working with CAD and CAM such as Laser cutting and 3D printing is really enjoyable.



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