

T Level Technical Qualification in Design and Development for Engineering and Manufacturing (8730-14)

**8730-035 Employer-Set Project
Exemplar – E Grade
Summer 2025**

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Introduction

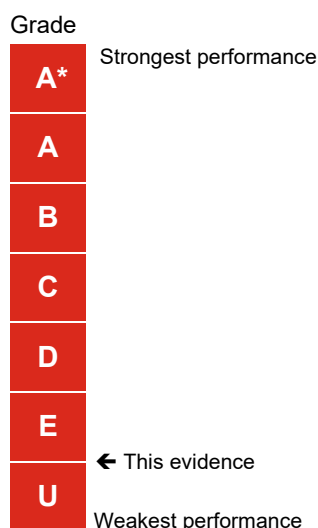
Summer 2025 Results

This document is aimed at providers and learners to help understand the standard that was required in the summer 2025 assessment series to achieve an E grade for the 8730-035 Design and Development for Engineering and Manufacturing Employer-Set Project (ESP).

Providers and learners may wish to use it to benchmark the performance in formative assessment against this to help understand a potential grade that may be achieved if a learner was to attempt the next summative assessment series.

The Employer-Set Project is graded A* to E and Unclassified.

The exemplar evidence provided for the E grade displays the holistic standard required across the tasks to achieve the E grade boundary for the summer 2025 series. A slightly weaker performance would have resulted in an Unclassified (U) result being issued.



The Employer-Set Project brief and tasks can be downloaded from [here](#).

Important things to note:

- The exemplar evidence presented, as a whole, was sufficient to achieve the E grade. However, performance across the tasks may vary (i.e. some tasks completed to a higher/lower standard than an E grade).

Marking of this Employer-Set Project is by task and Assessment Objective, below is a summary of these along with the mark achieved by the evidence presented and the maximum mark available for each aspect.

Task	Assessment Objectives	Mark achieved	Max mark available
Task 1 Research	- AO1 Plan their approach to meeting the project brief - AO2a Apply core knowledge - AO3 Select relevant techniques and resources to meet the brief	3	9
	- AO2b Application of core skills	3	6
Task 2 Design	- AO1 Plan their approach to meeting the project brief - AO3 Select relevant techniques and resources to meet the brief	3	6
	- AO2a Apply core knowledge	3	6
	- AO2b Application of core skills	3	6
	- AO5a Realise a project outcome – was the right outcome achieved - AO5b Review how well the outcome meets the brief, how well the brief was met, the quality of the outcome in relation to the brief	2	6
Task 3 Plan	- AO1 Plan their approach to meeting the project brief - AO3 Select relevant techniques and resources to meet the brief	1	6
	- AO2a Apply core knowledge	1	6
	- AO2b Application of core skills	1	6
Task 4 Present	- AO1 Plan their approach to meeting the project brief - AO3 Select relevant techniques and resources to meet the brief	2	6

	- AO2a Apply core knowledge	2	6
	- AO2b Application of core skills	2	6
	- AO5a Realise a project outcome – was the right outcome achieved - AO5b Review how well the outcome meets the brief, how well the brief was met, the quality of the outcome in relation to the brief	1	6
Maths	- AO4a Use of Math skills	2	3
English	- AO4b Use of English skills	1	3
Digital skills	- AO4c Use of digital skills	1	3

What evidence was being assessed for the maths, English and digital skills:

Maths:

- Annotations on sketches (Task 2)
- Dimensioning and scaling CAD drawing (Task 2)
- Supporting calculations (Task 2)
- Calculation of design and manufacturing cost, timescales and critical path within the Programme of work (Task 3)

English:

- Technical brief (Task 1)
- Reflective Notes detailing how the designs meet the brief requirement (Task 2)
- Supporting statement for the programme of work (Task 3)
- Presentation delivery (orally) and materials to support presentation (e.g. slides etc) (Task 4)

Digital:

- Types of sources used for Research (Task 1)
- CAD Drawing (Task 2)
- Presentation of the programme of work (Task 3)
- Presentation materials (slides, handouts, notes etc) (Task 4)

Task 1 Research

Assessment number (eg 1234-033)	8730-035
Assessment title	Employer-Set Project

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	1
Evidence title / description	Evidence expected for marking: Part A Research notes including a list of references/sources Part B Technical brief (typically 1500 words) Evidence submitted for marking: Part A Research notes including a list of references/sources Part B Technical brief
Date submitted by candidate	DD/MM/YY

Task 1 – Research

Research of existing products including their dimensions, price, materials, components, and sustainability:

Part A

Existing Product No.1:

<https://www.amazon.co.uk/LiveFine-Automatic-Prescriptions-Medication-Supplements/dp/B08KJHQR5V?th=1>



- Automated design so not constant hassle to refill pills as well as a reminder to take them as it does it for you
- Material – Made out of plastic which is recycleable
- Price - Costs £75.13 which is expensive by itself excluding the cost of medication
- Components – Includes a lock so the pills aren't taken out as well as a timer and alarm however this also makes the product 0.9kg in weight which is not good as we need to make something like this with a weight of half a kilogram or under
- It is powered by 4 AAA batteries which could be possibly changed if needed
- With the assistance of AI (<https://deepai.org/chat>) an estimated price for manufacturing this product would be anywhere from £7.50 to £23.00
- Dimensions - 23.5 x 19.99 x 5.46 cm, 898g

Existing Product No.2:

https://www.amazon.co.uk/dp/B09MFLR8MJ/ref=sspa_dk_detail_2?pd_rd_i=B09MFLR8MJ&pd_rd_w=AUqso&cor_id=amzn1.sym.6910e71b-a457-4d1b-9885-9ac6dea34603&pf_rd_p=6910e71b-a457-4d1b-9885-9ac6dea34603&pf_rd_r=EMZ9T3VTTX3JPDDK68H9&pd_rd_wg=cq2qD&pd_rd_r=5e5842b2-2695-4f46-a7af-4460e6b60203&s=drugstore&sp_csd=d2lkZ2V0TmFtZT1zcF9kZXRhaWwy&th=1



- Not an automated design so you will still have to use a separate timer to use your pills
- Large pill capacity where it can hold pills the size of 25mm
- Comes with a cup which you use for at the bottom of the product where you press a lever to dispense your pills
- Has 14 Compartments for pills

- Material composition – BPA-free food-grade material meaning it doesn't contain any traces of Bisphenol-A
- Includes a simple yet efficient child safe lock so children don't get any sort of access to the pills the client uses
- Has a pop off cap to easily refill the pills after 1 or two weeks of use
- Has a price point of £33.99 which is a reasonable price and its also within the health trusts budget for the cost of a unit as they have said their maximum is £65
- With the use of AI (<https://deepai.org/chat>) I can make an estimate that the cost of manufacturing for this product would be around £6.80 to £13.00
- Dimensions – 27.1 x 9.8 x 8.4 cm, 725.75g

Opening/Closing Mechanisms

- If possible, I will use a simple open/closing mechanism where when the pill needs to be released a small door that opens up or slides so the pills can fit right through.
- Each compartment must be atleast 70mm x 20mm for enough space to hold three pills to sit in comfortably so they don't get stuck in the compartment.
- Also, something like an electronic latch could work if it is programmed to only unlock when a user needs to take their pills at a certain time.
- Depending on the design of the pill dispenser it should have a small motor that rotates the pills inside to the area of where the pills come out which will work with the use of a clock and programming.

How could it be programmed?

- A product could be programmed with a timer to alert the user of when to take their pills
- Also, a clock to show the time and how long they have until they need to take it
- Also, a L.E. D's will help to show where the pills are coming out from if the product design is very similar in a sense where it all looks the same.

Locking systems only accessible by the pharmacy

- For the pharmacy to access the product and unlock it to refill the pills there are a few ways to do this.

- One way for only the pharmacy to access this is have a special key which the client is unable to use however it will have to be an abstract design because key locks can be picked so a different design could be needed for a key lock.
- Another way to have the product only opened and refilled by the pharmacy is to have a fob with a signal on it and have the pill dispenser with a signal reader so only those fobs the pharmacy has can be used to open it.
- That also lowers the chance of the user breaking/ opening it themselves which then lowers the amount of risk for the user or user children to access the pills in the dispenser as they could be dangerous to certain groups of people.

How could it operate and the cost to manufacture?

- I think that the pill dispenser should operate with the use of batteries and that there will be a small motor in the centre of the pill dispenser that will rotate it to a main point of where all the pills come out it will use the help of a clock to know what time to rotate it to the main area this will reduce the risk of anyone else getting their hands on the pills being dispensed which could cause more problems.
- On average and with all things mentioned and possible things later on I think that the cost of manufacturing a product like this will be around £10.00 to possibly £25.00 depending on where it is to be manufactured and the quality and sustainability of the materials used.

Health and Safety considerations

- The pill dispenser will be childsafe using the system which was talked about earlier where a motor will rotate the pills when the pills are needed so no one has a way of accessing them until the time to take them comes up.

Part B

Technical Brief – Initial concept ideas

Materials

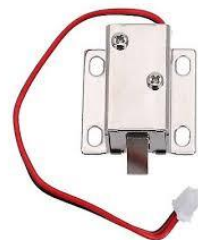
- The preferred material for the pill dispensing box will be High Density Poly Ethylene which is waterproof and a very strong plastic. It is also a recyclable plastic which makes it even more sustainable because it is one of the easiest

plastic polymers to recycle. Ref. (<https://www.plasticsforchange.org/blog/which-plastic-can-be-recycled>).

- I hope to make the pill dispenser waterproof by having airtight compartments using a lining of silicone or rubber around the edge to make an airseal where nothing is able to go in or out except the one part of the dispenser where the pills are dispensed from.

Opening and closing mechanisms

- The open and closing system I think will work well and is very simple to understand is something like a small electronic latch that will open with the press of a button and close after a short timer e.g., you press a button to release the pills you take that day and after 10 seconds of being open the latch closes and rotates for the next set of pills you need in a later time.



Item Photo From - <https://www.ebay.co.uk/itm/305740670549>

Ease of programming

- The item dispenser should require minimal programming for the pharmacy as it will be an efficient yet easy design where all the pharmacy will need to do is set the time/ times of day where a buzzer will go off on the pill dispenser to alert the end user to take their number of pills at that required time

Locking system

- The preferred locking system I will use is an electrical magnetic lock that is only able to be unlocked by special fobs that give off a signal which could lock and unlock the pill dispenser. This is so the pills are only refillable by the pharmacy and makes the end user have the correct doses of each pill at the right time which will prevent the end user taking pills too early, too late and preventing accidental overdoses also.

Key Requirements

- The key requirements of this pill dispenser is that it will have dimensions of 190mm(L) x 190mm(W) x 60mm(H) with each compartment able to fit 3 pills with the pills at a maximum of 20mm long and 5mm in diameter.

- It also has to be powered by batteries and include a button that says press here to make the pills be dispensed as well as a flashing light to alert the end user to take their pills.
- It must be easy for the pharmacy to reprogram, refill and dispense the pills in two ways – once a day Medication – refill every 28 days and – twice a day medication – refill every 14 days
- It has to be tamper-proof and require minimal maintenance

Suitable for repeated use and also has to be waterproof

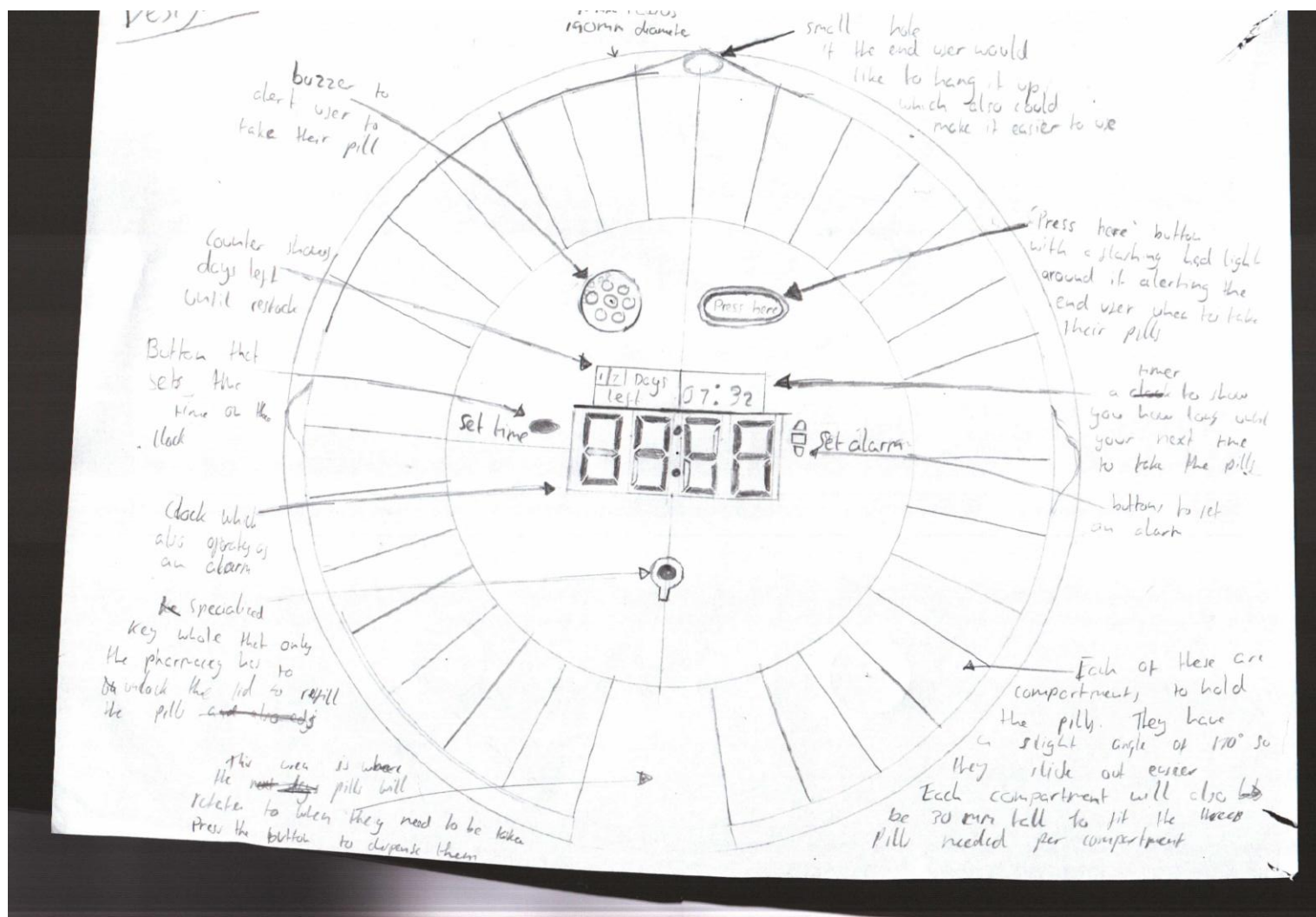
Task 2 Design

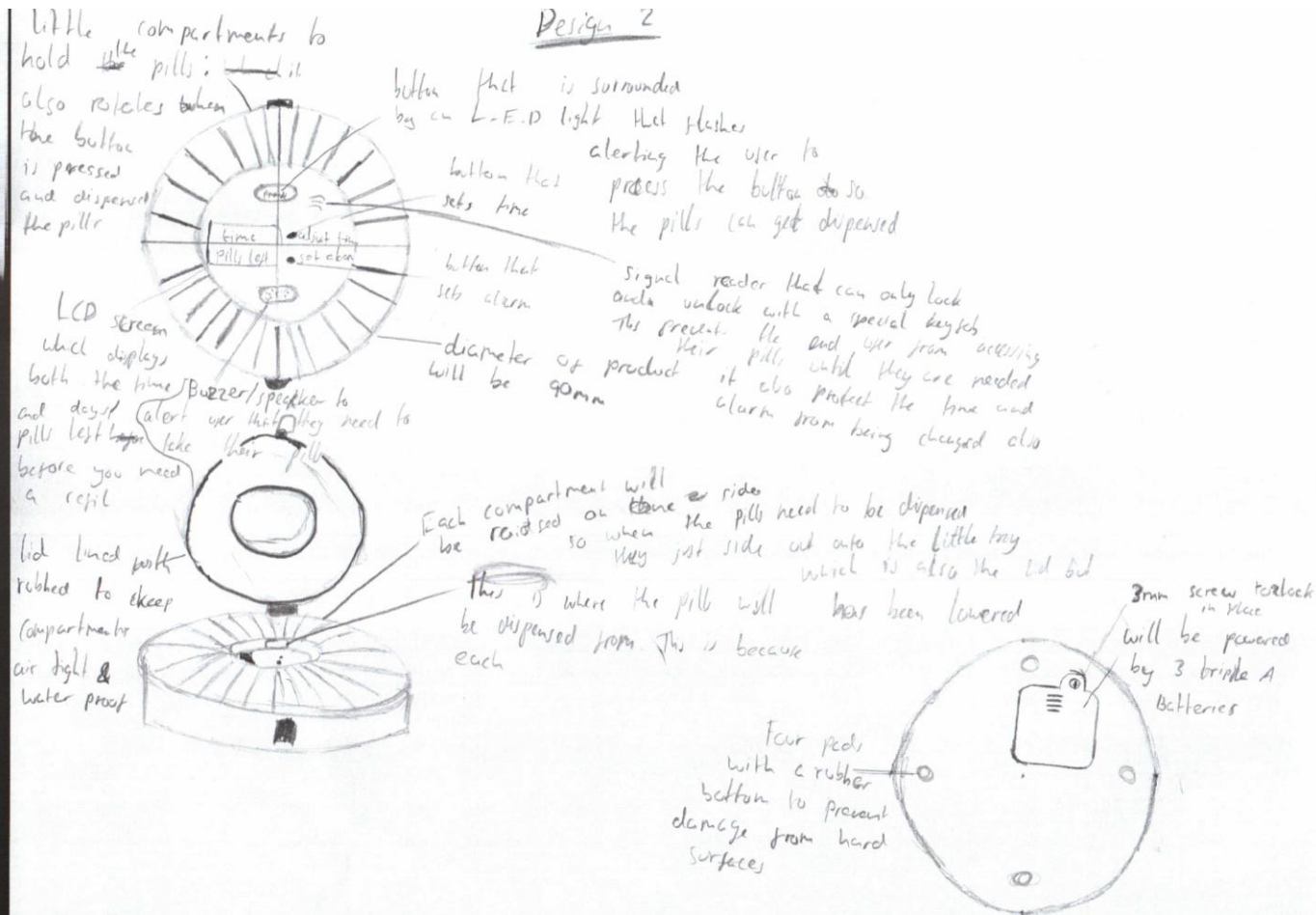
Assessment number (eg 1234-033)	8730-035
Assessment title	Employer-Set Project

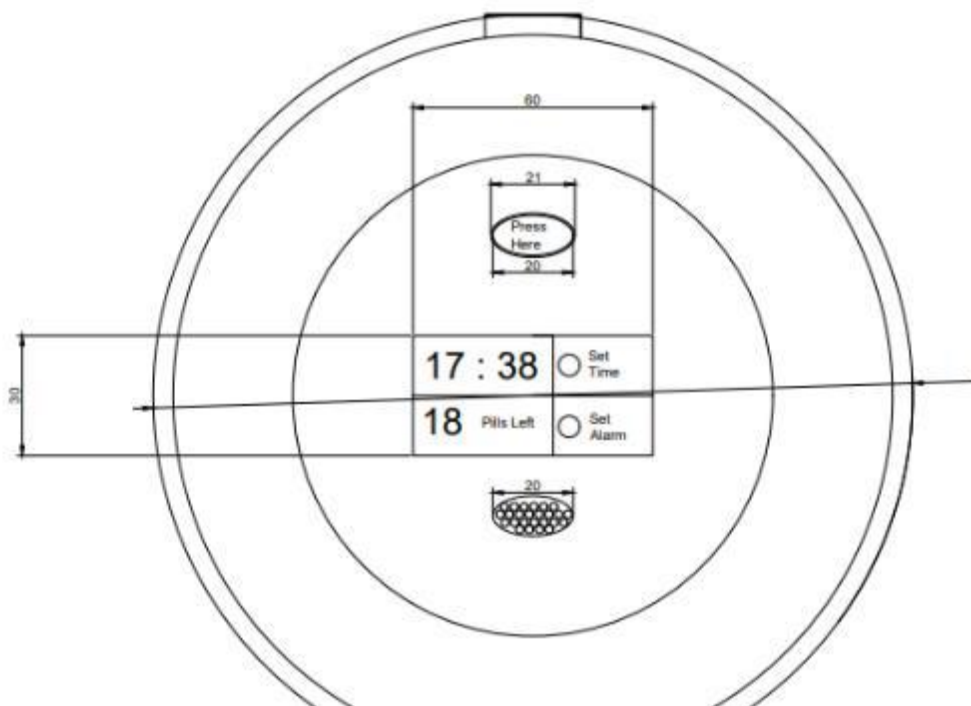
Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	2
Evidence title / description	Evidence expected for marking: Part A 3D Sketches for two designs Supporting Calculations Part B Annotated CAD drawing for one preferred design (typically two A3 size drawings) Reflective Notes (typically 500 words) Evidence submitted for marking: Part A Sketches for two designs Part B CAD drawing for one preferred design
Date submitted by candidate	DD/MM/YY







Task 3 Plan

Assessment number (eg 1234-033)	8730-035
Assessment title	Employer-Set Project

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	3
Evidence title / description	Evidence expected for marking: Part A Programme of work (two sides of A4) Part B Supporting Statement (typically 1000 words) Evidence submitted for marking: Part A Programme of work Part B Supporting Statement
Date submitted by candidate	DD/MM/YY

Task 3 – Plan

Steps of Manufacturing:

Choosing Location – Due to the current import tariffs globally and especially in places like China I will not manufacture the pill dispenser in that country and instead manufacture the pill dispenser in a country like Indonesia or the Phillipines. This is because these two previously listed countries still have cheap prices to export products from and it is low cost to produce the dispensers.

Manufacturing – Key Parts

High Density Poly Ethylene (HDPE) is a key component in the manufacturing process due to its high strength. There are many ways to go about when manufacturing this product and HDPE allows variable ways for us to use it to create the form, we want it to have. A good thing to also note is that HDPE is also a very cheap product only costing around £2.00 per kilogram. We have to produce 1,500 units and they have to be of a weight of 500g or lighter. This means that we use £1,500 minimum out of our £97,500 budget just for the cost of HDPE without taking into consideration the other components for the pill dispenser.

Manufacturing – Week 1-12

Through these first few weeks I will make sure that we have a factory to manufacture and assemble these components that will be made into the pill dispenser. All components will be quality checked and assembled by professionally. By this time we will have all components and start manufacturing around the second or third week. During this time there will be a high number of units produced per day aswell as a prototype every week to make sure there are no faulty products. The estimation on the price per unit is around £55.00 including items like a speaker L.E.D. light, a rotor as well as a clock/timer.

Quality Control – Week 13-18

Packaging – Week 19-23

Distribution – Week 24-30

	A	B	C	D	E	F
1	TASK		START	FINISH		DURATION
2	Maunfacturing		30/04/2025	30/07/2025		12 Weeks
3	Quality Control		31/07/2025	04/09/2025		4 Weeks
4	Packaging		05/09/2025	03/10/2025		4 Weeks
5	Distribution		04/10/2025	13/12/2025		10 Weeks

Task 4 Present

Assessment number (eg 1234-033)	8730-035
Assessment title	Employer-Set Project

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	4
Evidence title / description	Evidence expected for marking: Presentation materials Presentation Q & A Record Evidence submitted for marking: Presentation materials Presentation Q & A Record
Date submitted by candidate	DD/MM/YY

WESTVIEW BIOMEDICAL ENGINEERING PRODUCTS

THE AUTOMATED PILL DISPENSER

Initial Ideas Behind the Automated Pill Dispenser

- There were multiple ideas for the automated pill dispenser and these were from the inspiration of other previous products and changing certain aspects so that they could be better.
- I would create new designs that are similar to current modes however alter multiple parts about it. E.g. Dimensions, compartment Sizes, electronic devices. and how the pills will be dispensed.
- I was ensuring that the product does not exceed the requested requirements and that it will be sustainable and long lasting.
- One of the initial product designs was a circular pill dispenser that at the press of the button and at the right time it will dispense the pills(max of 3) from one compartment and that it would roll to the centre where there is a small plastic tray that is able to be picked up which will hold the dispensed pills for the end user to take.
- That dispenser is also pretty mechanical using components like small gears that rotate the pill dispenser at the press of the dispense button.



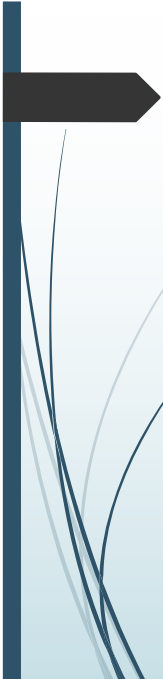
Possible Materials and Locking Mechanisms

- After looking at multiple plastics considering that it is lighter than metal in general I have decided that the main material in the automated pill dispenser will be High Density Poly Ethylene. This material is an easily recyclable plastic as well as being able to be formed into a strong hard plastic.
- What is also a benefit of using HDPE is that it is a relatively cheap plastic ranging from around £0.80 to £2.00 per kilogram.
- After looking at multiple locking mechanisms to keep the pills safe I decided I would most likely use a basic lid lined with silicone around the edge as it keeps the compartments dry as well as keeping the pill dispenser water proof.
- To prevent the end user from accessing the pills the lid will be locked with a specialized key only pharmacies have so only they can load the pill and control the dosage as well as the times needed to take them with the configurable clock and alarm in the centre of the pill dispenser

Final Idea and Components Used



- My final idea of the automated pill dispenser is something that can hang upon a wall so at the press of a button it will dispense the end users need pills into a cup that they hold underneath the dispenser as it rotates and drops the necessary pills for them.
- It is 190mm in diameter with each compartment 70mm x 20mm leaving enough space for 3 big pills per compartment.
- It will have a hook that is attachable to the top of the pill dispenser enabling it to hang
- It will have a button in the centre with a white led ring around it that flashes so you know when to press the button to dispense pills



Health and Safety Considerations

- The pill dispenser will be child safe using the system where a motor will rotate the pills when the pills are needed so no one else has a way of accessing them until the time to take them comes up
- Using that function it will lower the risk of a child getting their hands on the pill or the end user taking more pills than needed

Employer-Set Project – Presentation Q & A Record (Task 4)

8730-14 T Level Technical Qualification in Design & Development for Engineering and Manufacturing

8730-035 Employer-Set Project (Summer 2024)

Candidate name	8730-035
City & Guilds candidate No.	ABC1234
Date	DD/MM/YY

Provider name	<provider name>
City & Guilds Provider No.	999999a

Record observation notes below to inform external marking. **Notes must be detailed, accurate and differentiating.**

Tutor questions to candidate	Candidate responses
What did you consider when selecting the material for the unit?	Height, weight & durable, it is also less expensive (cheap).
What consideration did you give to the budget and how did this affect the production?	Price per unit, place of production, Health and safety considerations during production. Payment of workers wages and production duration.
What additional information would have been useful for us to have provided in the project brief?	Material recommendations and some choice of production route would be additional useful information.

--	--

Any other comments

--

Tutor signature

Date

X

DD/MM/YY

If completing electronically, double click next to the 'X' to add an electronic signature once the record is **finalised**.

Get in touch

The City & Guilds Quality team are here to answer any queries you may have regarding your T Level Technical Qualification delivery.

Should you require assistance, please contact us using the details below:

Monday - Friday | 08:30 - 17:00 GMT

T: 0300 303 53 52

E: technicals.quality@cityandguilds.com

W: <http://www.cityandguilds.com/tlevels>

Web chat available [here](#).

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