

## Criteria B: Concept Design The Generation and Exploration of Ideas

'Ideas which meet the specifications must show incremental development based on additional research, they should show a story from rough sketch to refined one with decisions based on user feedback and alternatives along the way.'

Once the design brief and specifications have been established, as a designer you need to explore a range of possible concepts through modelling (drawing, CAD, Physical modelling etc). As the concepts are developed and refined, their feasibility (if they will work) is measured against the specifications, which helps determine the most appropriate ideas

to take forward into the detailed design development phase. Students will use concept modelling to develop ideas to meet their specifications, which explore solutions to the problem and justify the most appropriate idea for the next stage (detailed development).

Hence Criteria B is split into the following Sections:

1. Create original, feasible ideas to meet specifications.
2. Develop and test your ideas against your specifications.
3. Justify and select one idea for detailed development.

### Key Points

1. Ideas must be measured against Design Specifications
2. Ideas must show incremental development based on additional Research, they should show a story from rough sketch to refined sketch with decisions and alternatives along the way.
3. A range of Modelling Techniques should be used to test aspect of your ideas ranging from appropriate drawing techniques, CAD, Rapid Prototyping & 2D Modelling.
4. The final solutions will be measured against the specification and user feedback to decide which one should be selected to go forward for detailed development.

## SUMMER HOMEWORK

### Criteria B.1 Original, feasible ideas to meet specifications

**Students must - create, develop and refine a range of feasible ideas to meet appropriate specifications, which explore solutions to the problem. Ideas must be incrementally developed (show progress), refined and measured (through annotation) against the specifications.**

#### **This must (Checklist):**

- **Generate 9 original ideas using a range of appropriate drawing techniques which meet the criteria from the specifications.**
- **Annotation to identify key features and explain how they meet the specifications.**
- **Undertake additional research as required to help the development of your ideas.**

Support with getting the STORY started:

Always ensure that when you are drawing your ideas you are checking that your ideas include as many of the specification points as possible. Draw and develop your ideas incrementally, don't rub out initial ideas, show how they are evolving.

Designers use many techniques to solve problems and come up with new products. Some methods are given below:

## **BRAINSTORMING**

This can be a quick way of getting started. Normally it is drawn as a bubble/spider diagram. Start with your client or problem in the centre and work outwards (E.g. Child's Interest-animals-pets, wild, cartoon-dogs, cats hamsters-sausage dogs, Alsatians).

Remember there are no right or wrong answers at this stage. (This should not take up much more than one quarter of the first page.)

## **MORPHING**

1. Start with patterns, geometric shapes and forms, natural shapes and forms, man made shapes and forms (e.g. other different products or buildings)
2. Simplify, repeat, enlarge, divide, subtract/add, highlight, outline, rotate or mirror shapes and forms to produce new shapes and forms.
3. Change the texture (shiny metallic, wooden, grating/mesh, padded textiles, holes in surface and many more)

## **INSPIRATION**

You may copy ideas or themes that may influence your designs and make them more interesting - you might want to use something you have picked up in passing but it is a good idea to do some research. Influences might include:

Work of other designers or architects; E.g. Starck, Anad, Breuer, Graves, Mackintosh or Christopher Wren

## **D&T IB**

Design movements or styles; E.g. Bauhaus, Memphis, Shaker

Themes e.g. miniature, techno

Other influences e.g. exhibitions, music or film

New technologies e.g. as seen in magazines or on T.V.

You can use the library or the Internet to help you on some of the above. You can cut/copy and paste some pictures into your work for further developments.

## **PRODUCT ANALYSIS**

One of the best ways of getting started is to copy ideas from other designs (not necessarily the whole product). This might include:

Styles (shapes, form, colour, texture, materials)

Design features/structure (base, stand, top, shelf, bracket, joint etc)

Components/mechanisms (nuts/bolts of various descriptions, levers and linkages etc)

Fittings and fixtures (knots, handles, hinges, brackets, runners etc)

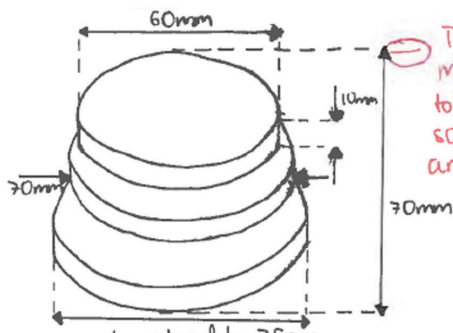
You can also use product analysis to help with analogous thinking. This is particularly useful if you have a functional problem that needs solving- an idea from a completely different product can be used.

**Rubric:**

<b>Develop ideas</b>		Pg#
	<ul style="list-style-type: none"> <li>□ <b>Generate</b> a wide range of <b>original</b> and <b>feasible</b> ideas. Eg. <i>attribute listing, morphological synthesis, SCAMPER, mood board, biomimicry, dematerialisation, green/eco/DFM</i>; the range will depend on the nature of your product -</li> <li>□ <b>Communicate and develop</b> your ideas using the <b>most appropriate method</b>. Eg. <i>conceptual sketches, 2D and 3D physical models (lower range of fidelity model)</i></li> <li>□ <b>Annotate</b> (&lt;10 words) to <b>identify key features</b> and explain how they <b>meet the design specifications</b></li> <li>□ <b>Select ideas</b> to incrementally improve /meet specifications</li> <li>□ <b>Communicate</b> ideas clearly <b>using appropriate techniques</b></li> <li>□ Undertake <b>additional research</b> as required to inform development. Eg. <i>manufacturing process, materials, joining, finishing, authentic user feedback</i></li> <li>□ Use <b>photographs</b> of manufacturing and models, <b>annotated diagrams</b></li> </ul>	
Topics: 1.1, 3.1, 3.2, 3.4, 5.1, 5.3, 7.2, 7.4, 8.3		
<i>10 pages, no extended writing (limit)</i>		
<b>0</b>	The work does not reach a standard described by the descriptors below	
<b>1-3</b>	Demonstrates <b>limited</b> development of a <b>few</b> ideas, which explore solutions to the problem	
<b>4-6</b>	Develops <b>some</b> ideas, with reference to the specifications, which explore solutions to the problem	
<b>7-9</b>	Develops <b>feasible</b> ideas to meet appropriate specifications, which explore solutions to the problem	

Sample student work on next page:

Criterion B: Ideas



⊖ The handle may be painful to grip for someone with arthritic hands.

easily storable in a kitchen drawer

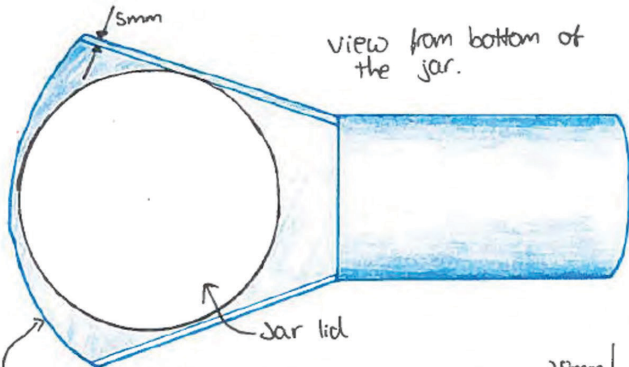
Silicone  
↳ comfortable and easy to grip on the lid and for the hand

Can open different size lids  
↳ silicone is a flexible material so the opener doesn't have to fit exactly on the lid.

Can be manufactured in a variety of colours.  
↳ appropriate for both genders and all ages.

Glass jar

can be put in a dishwasher if it gets dirty  
↳ ideal for elderly people with arthritis as they don't have to hand wash it.



view from bottom of the jar.

Painted stainless steel



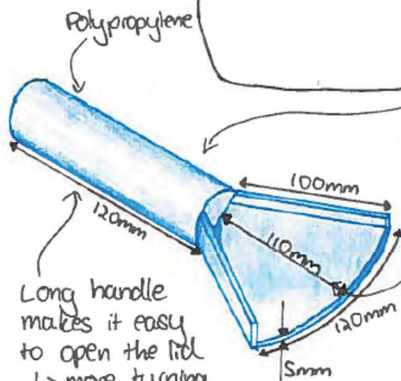
Side view

Cylindrical handle so it's more comfortable to hold.

⊖ Cannot open cartons of juice etc.

⊖ The silicone might perish after a few years rendering the product useless.

⊖ It is not entirely suitable for opening bottles

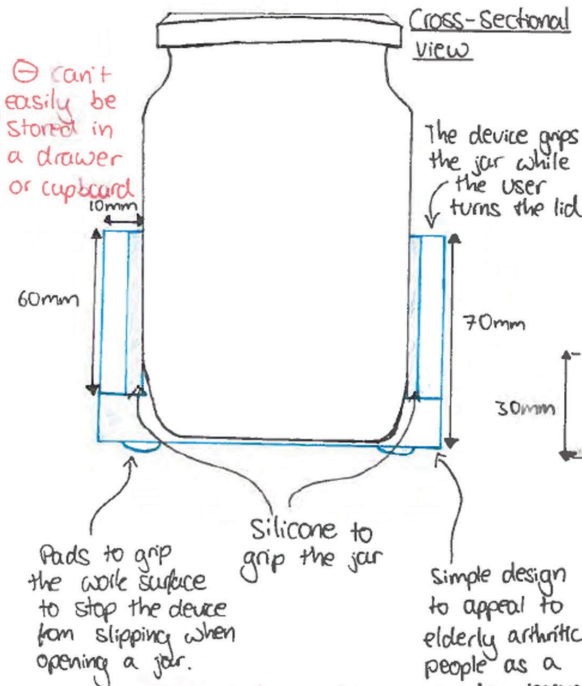
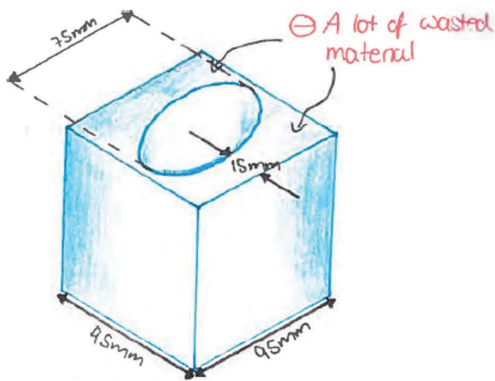


Long handle makes it easy to open the lid  
↳ more turning force.

Funnel shape allows multiple different size bottle/jar lids to be opened.

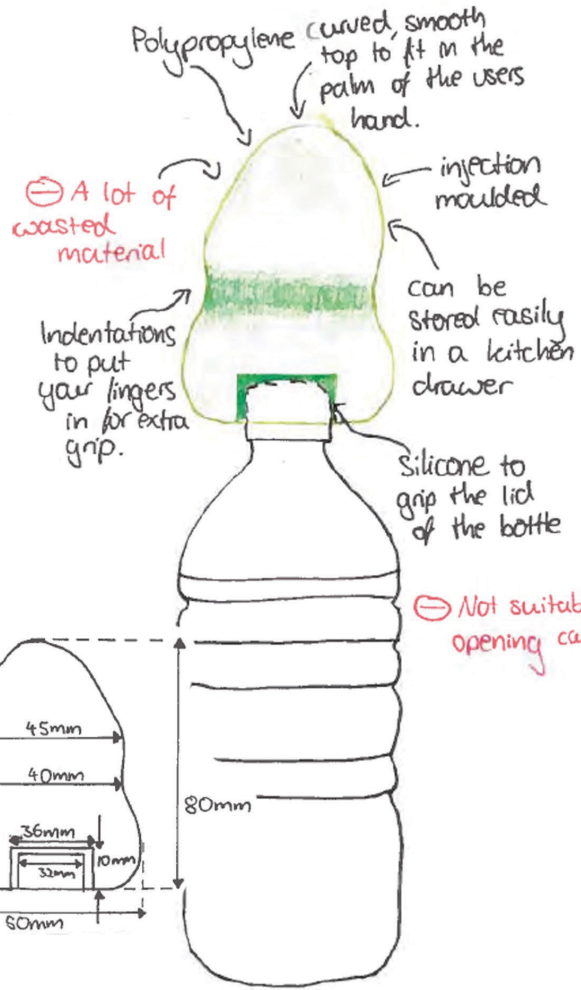
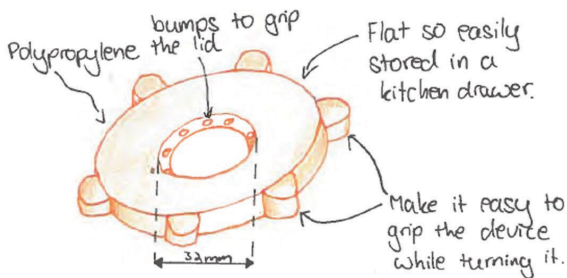
Easily stored in a drawer as it is relatively flat.

**Criterion B: Ideas**

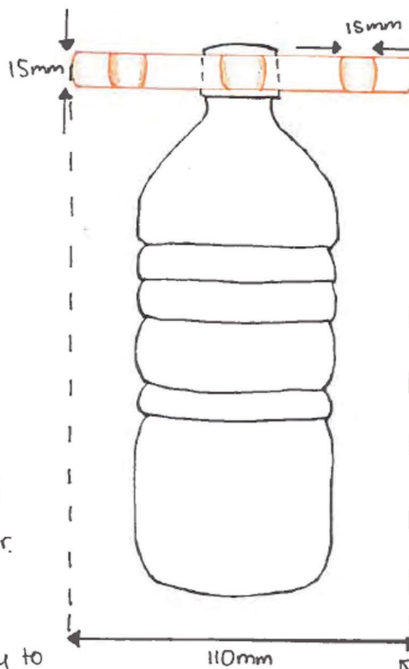
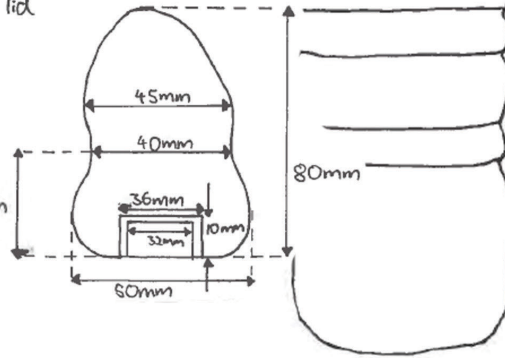


⊖ This product does not accommodate for a variety of jar / bottle sizes.

Simple design to appeal to elderly arthritic people as a complex design can put people off.



⊖ Not suitable for opening cartons



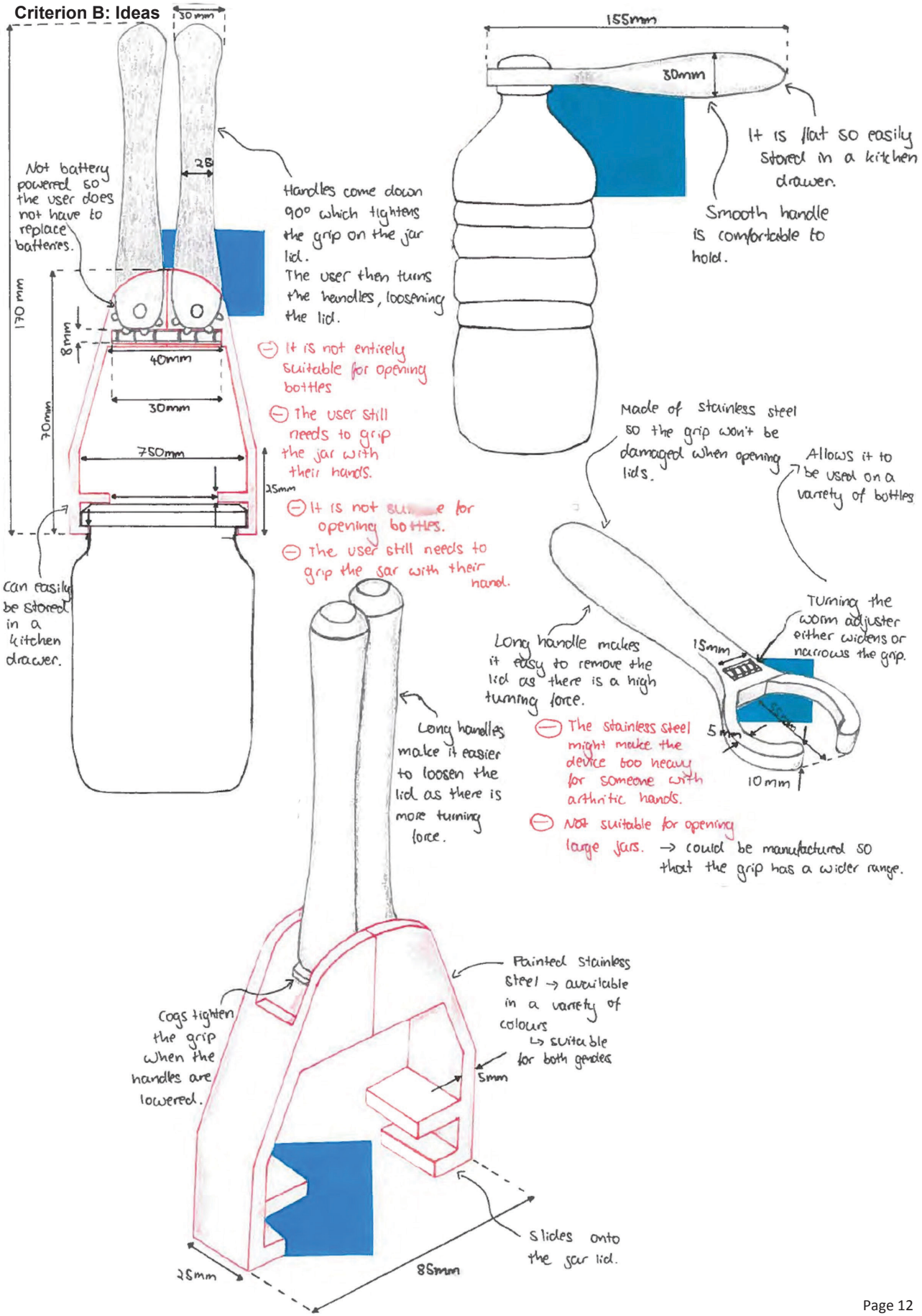
Side View

⊖ Does not accommodate for a variety of bottle / jar lids.  
↳ could be manufactured and sold as a set with different size centre holes for a variety of standard bottle and jar lids.

Large diameter so easy to hold + to turn.

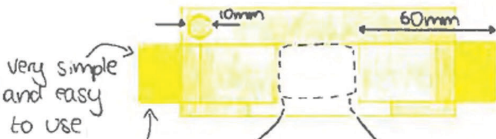
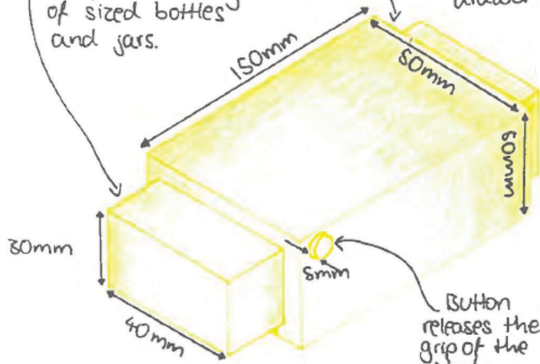


**Criterion B: Ideas**



**Criterion B: Ideas**

Adjustable blocks allow the device to open a variety of sized bottles and jars.



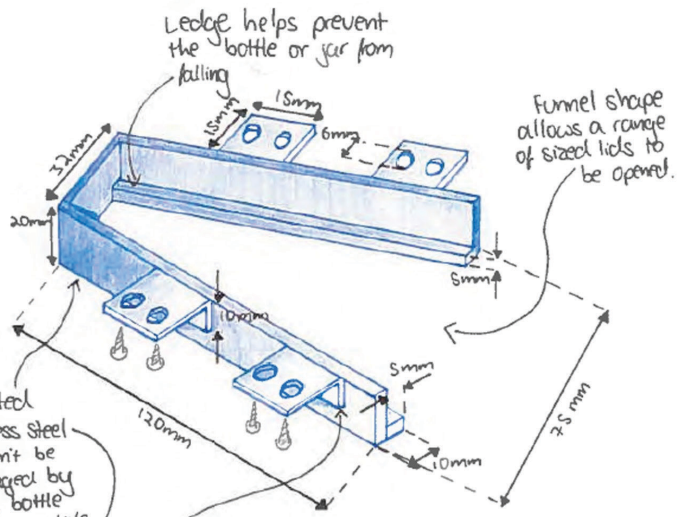
Push the blocks in to grip the bottle top, then twist the bottle to remove the lid.

⊖ The user still has to twist the bottle with their hand which may be painful.

Quite flat so it can easily be stored in a kitchen drawer

Button releases the grip of the blocks.

Painted stainless steel  
↳ won't be damaged by plastic bottle tops or jar lids.



Funnel shape allows a range of sized lids to be opened.

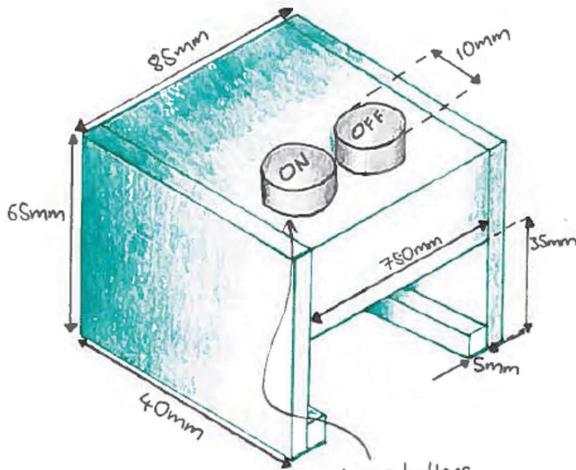
Brackets are welded to the device  
↳ stainless steel also.

Can be painted in a variety of colours  
↳ appropriate to both genders

Screws secure the device to the underside of kitchen cupboards.

⊖ The user may require someone else to attach the device for them.  
⊖ Not suitable for cartons.

Electric jar opener Side View means the user doesn't have to twist the wrist to open the lid.



Stainless steel

Allow the grip to change size accordingly to the size of the jar.

Three electro-magnets 'stick' to the lid then turn to remove the lid.  
↳ they are positioned in a triangle.

Where the battery and electronics are.

Grip the top of the jar so it doesn't move while the lid is being loosened.

⊖ Only opens jar lids and not bottles.  
⊖ Requires the battery to be changed.

Cross-sectional view