

Mini-Design Danaway - using an OBREDIMET pro-forma designed to engage teenagers in the design process



I have been thinking in the background of my diploma that I would like to deliver permaculture ideas to teenagers. During the August and September 2020, I was involved in the Danaway Lifestream Programme, aimed at supporting 20-year-olds to make regenerative decisions during this time which potentially would hit their age group hardest.

In the first week of the programme the participants undertook an Introduction to Permaculture course and in the second week completed a design. During the first week my thoughts turned towards delivering the design process to teenagers and I came up with a “mini-design” (which I hope to include as a separate Diploma Design once I have worked it through)

that would lead them through the design process, by asking questions, providing some tools and space to reflect on the principles and ethics. In the second week, while the participants were working on their design, looking at collecting water for the poultry on site, I test drove my mini-design by looking at the grey water from the kitchen. The design below is the outcome of that test drive. The blue text is the “pro-forma”, the yellow highlighting shows the questions I used to complete the design.

Designer:

GW

Client: Danaway

Date: August 2020

What question will your design answer? How can the grey water from the kitchen be more effectively used?

Observe

Location:

Where are you?

Which County / Town?

Are you near the sea, mountains, river ...?

General Information:

What is happening?

What have people told you?

Do you know of anywhere else that is similar?

People:

Who owns the site?

What people are involved?

How do people move about the area?

Who can help you?

Client Interview.

Senses:

What do you see, hear, smell?

Structures:

What buildings are there?

How close is it to the house?

This design is based at Danaway Permaculture Homestead in Eaglesfield, West Cumbria. It is on the coastal plain about 8 miles from the sea, and two miles from the town of Cockermouth. Danaway is owned by Rick Cross and is used to deliver a variety of events, some of which involve people staying on site. There is no sewerage or electricity beyond the main house.

The washing water from the kitchen fills the tub up quickly when there are people living on site and it needs emptying every day. Currently it is emptied onto the hedges. When it rains this adds water to the tub from the sink which is open to the weather.

There is also washing up water from the bowls used outside the kitchen which is poured onto the hedges.

If it is sunny the grey water could become smelly if it is not dealt with for a few days.

The polytunnel is used for growing tomatoes, squash and other vegetables. It is 5 paces away on the same level as the tub.

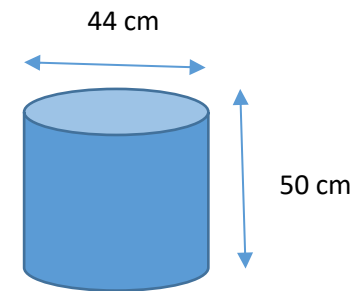
The rain falling on the field to the east and south east of the kitchen will run towards the polytunnel, but the polytunnel needs more water than this and is watered with mains water every day. The mains water is metered so there is a cost to this, there is also a high amount of energy required to clean mains water to drinking standards, unnecessary for watering plants.

Water is carried from the tub in a watering can. There will be sediment from washing up and food preparation at the bottom of the tub.

The soil is heavy clay. The ground next to the polytunnel is quite soft and covered with weed suppressant membrane.

The polytunnel is 7.5 m long and has a brick path up the centre.

The tub holds approximately 75 litres of water.



Are there fences, hedges, roads, paths?

Water:

Where can water come from and go to?

Animals and Plants:

What animals (wild, domestic) are there?

What plants (wild, vegetables, trees, fruit bushes, weeds) are there?

Are there animals or plants missing?

Weather and Climate:

What is the weather like?

Is it sunny or in the shade and when in the day?

Which direction does the wind come from?

Where is it sheltered from the wind?

What is the weather like at different times of the year?

Soil:

Is the ground /soil wet or dry?

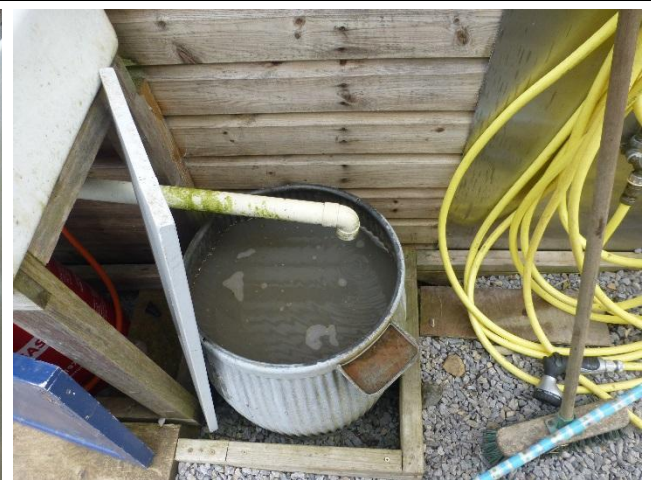
Is the soil sticky or crumbly?

Is the ground flat or sloping, which way does it slope?

Other things:

What measurements will you take?

What tools can you use?



Boundaries

Draw a map or diagram.

Include:

T – Title

O - Orientation – a (north arrow)

A – Author

D – Date

S - Scale

What things will be difficult to change?

How much can you spend?

How long will it take to do?

How long do you have to do it?

Will it affect other people, e.g. neighbours?

What things will be difficult to do?

The site:

Danaway: vegetable garden, kitchen, polytunnel and yurt – August 2020. From Google Maps



Ideally the design should use materials from the site.

The speed of drainage could be an issue, as grey water would sit on the soil surface.

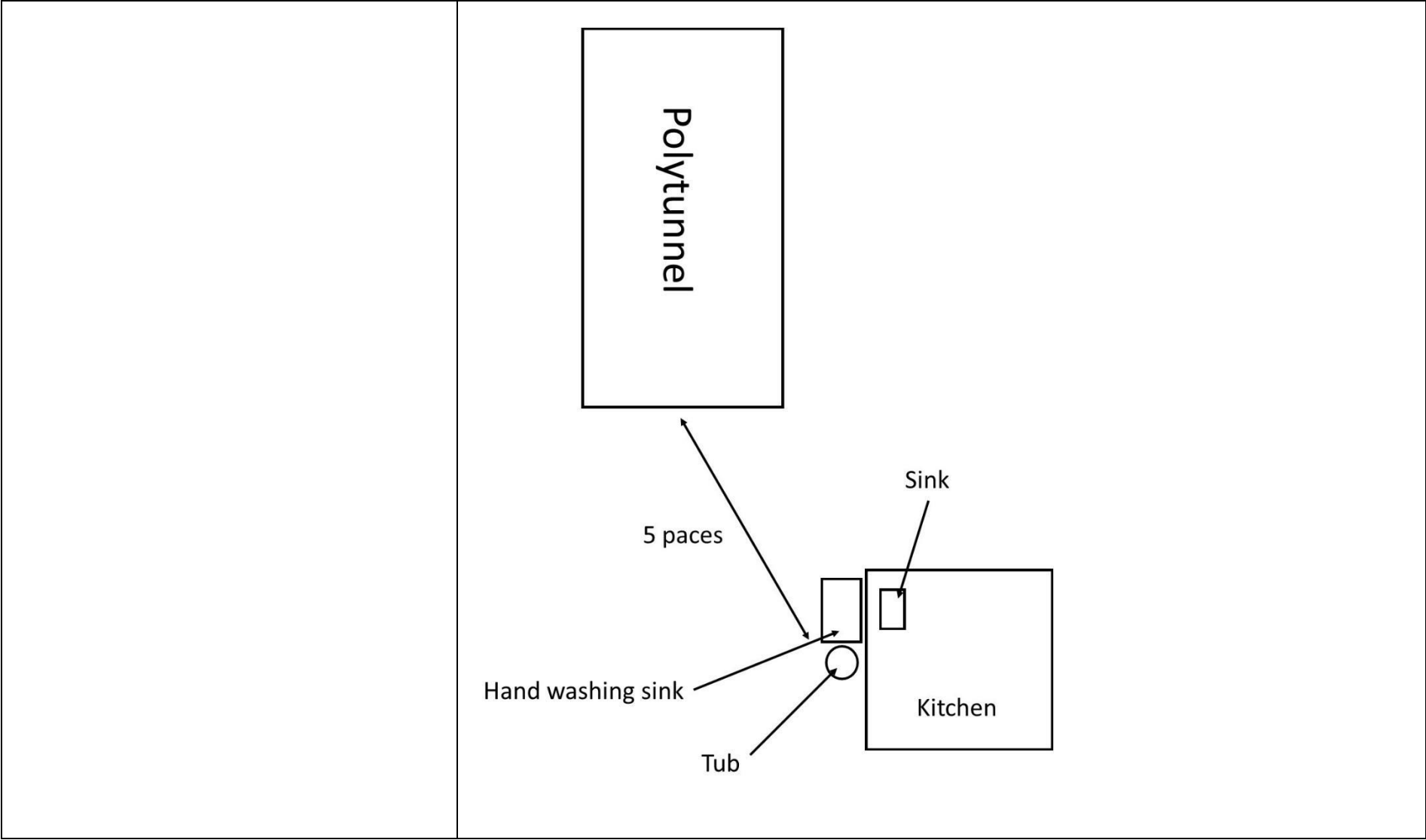
Grey water cannot be used to directly water plants such as lettuces.

It will be difficult to move the tub as the base is set below ground level to get sufficient drop from the plug hole and moving the waste pipe would therefore be difficult.

The sink in the kitchen cannot be moved.

Running a pipe from the tub to the polytunnel would be a trip hazard and water could not be syphoned as they are at the same level.

The ground is soft next to the polytunnel and may get boggy in wet weather if walked on regularly.



Resources

Do you have the skills you will need?

Who can you ask or pay to help?

What do you need to learn?

What books, internet sites or people will you need to look at or talk to?

What equipment and materials will you need?

What things will you need to buy and how much will they cost?

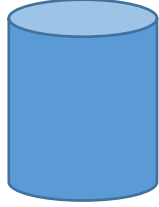


Are there materials on site?

Are there materials available for free?

Do you have the money you will need, if not how will you raise it?

When do you have time to do anything?

There are a collection of glazed, ceramic land drains in 3 different sizes which can be used. These are stacked near the house and are left over from building work. There is coarse 20 mm gravel. No skill will be needed to place the drains.

	A	B	C
All are 30 cm high.			
External Diameter	18 cm	13 cm	10 cm
Internal Diameter	15 cm	9 cm	7 cm
Volume	5300 cm ³	1900 cm ³	1150 cm ³
Number of drains to empty the tub	14	40	66
Number of drains to empty the tub when filled with gravel. Assume 1/3 volume of water.	42	120	193
Number of drains in the length of the polytunnel	41	57	75
Number of drains available	46	63	A few
<p>If used biggest drains and put them all the way along the edge of the poly tunnel, it would empty the tub if they were 1/3 full, or full if contained gravel.</p> <p>If used the middle sized drains then could empty the tub by filling them full, but could not if they contained gravel.</p> <p>There are too few small ones available, but if there were they would be the same as the middle size.</p>			

<p>Evaluate</p> <p>What different solutions can you think of? For each one look at the pluses, minuses and interesting things. Is there anything else you need to know, observe or measure?</p>	Possible Solution (be brief)	Pluses	Minuses	Interesting
	1) Water poured directly onto the soil in the polytunnel	No additional work needed. Saves money as not using mains water.	Cannot water all the veg because it is grey water	It would be interesting to see the difference between using mains water and grey water.
	2) Water poured into drains set into the beds in the polytunnel.	All veg can be watered because there is not direct contact between the water and the plants. The water will release into the soil slowly.	The drains take up planting space in the polytunnel. Water may be lost through evaporation when the polytunnel gets hot. There may not be enough drains to empty the tub.	How would the humidity and temperature of the polytunnel change with water standing in the drains.
	3) Drains set in the soil along the edge of the polytunnel, close to the wall.	This would get water to all the plants slowly. There is enough space to set drains to empty the tub.	The drains would need to be removed when the plastic of the polytunnel needs replacing.	Could collect rainwater off the polytunnel and direct to the soil inside.
	4) As 3) but with gravel in the drains.	Potentially may create a large surface area on the gravel that could treat / improve the water quality.	May result in slimy and smelly gravel. They would be difficult to move.	

<p>Design</p> <p>Which solution are you going to use? Describe it in detail, e.g. draw a labelled diagram or map. How long will it take? How are you going to get over the difficult things?</p>	<p>First Client Interview:</p> <p>We discussed the different options, including how to capture rain water off the polytunnel roof. This could be done by positioning the drains slightly under the board at the base of the tunnel. We felt that this would not catch any more water for the inside of the polytunnel as the rain would run off the polytunnel and seep into the beds inside without the drains anyway.</p> <p>Trial:</p> <p>We decided to do a set of trial drains, outside with and without the gravel and inside with and without the gravel. Digging the drains into the ground about 10cm. When the drains were dug into the ground outside the base was set into the clay layer below the soil. They both took the majority of a watering can to fill and the one without gravel drained away to about 10 cm in 5 minutes and completely in 15 minutes. The fact that in the gravel filled drain any sitting water cannot be seen may be an advantage. Inside the polytunnel the water drained away quickly, it was noticeable that the soil structure inside was more friable and porous compared to the clay soil outside.</p> <p>Second Client Interview:</p> <p>It was decided that given the speed of drainage, the soft nature of the ground outside and the ease of watering in the polytunnel that we would place 2 large drains between each row of tomatoes and use the water to water the tomatoes only. This could also be used in the future to water the squashes at the end of the polytunnel but currently there is too much growth. The drains would not have gravel in them as this did not seem to make any difference to the process and would be difficult to move at the end of the season. The drains were dug in 10 cm. There were 8 drains used, with a potential for another two for the squash. Other drains could be put in the other beds in the future. It will take about 30 minutes to install the drains in the polytunnel.</p>
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What Permaculture Principles have you used and how? (See list at the end)	Principle	How I have used it
	The problem is the solution	We have designed a system where the problem of what to do with the grey water from the kitchen has become the solution of watering the tomatoes in the polytunnel.
	Produce no waste	The grey water is no longer wasted by being poured onto hedges that were doing perfectly alright without it. It is now not waste water but water with two functions, washing and watering. The grey water will contain nutrients that will benefit the tomato plants.
	Use slow & small solutions	We considered a number of possible solutions but in the end chose the smallest one of putting the drains directly into the polytunnel beds. We did not consider pumping the water because of the health and safety issue of having a pipe across the path and chose a slower more meditative solution of carrying the water in a watering can.
	Make the least change for the greatest possible effect	Putting the drains in the polytunnel beds was the least change solution, even so it uses up sufficient water with 10 people on site, and there is the opportunity to increase the number of drains by putting them in other beds, if more people are on site. Watering in the polytunnel also allows you to check on the plants at while watering, whereas placing the drains outside the activity is only transferring the water.
	Use & Value Renewable Resources & Services	The design means that no mains water is needed to water the tomatoes. This saves on the energy cost of treating the water to drinking standard as well as saving money as mains water is metered. The drains were recycled from previous building work.

<p>Implement</p> <p>Make a things to do list to make sure you can do your design. Include who is doing what and when. (use small chunks)</p>	<ol style="list-style-type: none"> 1) Collect drains from in front of the house. 2) Dig then into the soil in the beds in the polytunnel. One at the front of the bed and one at the back, between each row of tomatoes. 3) Fill the drains up each day from the water tub. 4) When the polytunnel is next planted up, put more drains in the other beds. 5) 6) 7) 8) 9) 10)
<p>Maintain</p> <p>What do you need to do to keep things going?</p>	<p>Every day - Empty the tub into the drains, evenly.</p> <p>Every week – Check the drains to see if there is too much food waste collecting at the bottom. If so sprinkle some soil in the base of the drain.</p> <p>Every month – If there is a build-up of food waste in the bottom of the drain, move the drain within the gap between the rows of tomatoes.</p> <p>Every year – Remove the drains and replace for new planting scheme.</p>

<p>Evaluate</p> <p>What went well?</p> <p>What could be even better?</p>	<p>What went well?</p> <p>The current set up of 8 drains would empty over half the tub, which with the current usage of the kitchen would use most of all the water generated in a day.</p> <p>The simplest design proved to be the best.</p> <p>There was no cost, as all the drains were on site.</p>	<p>What could be even better?</p> <p>It will be better next year when the drains can be placed before any planting.</p> <p>If it included washing up water when done outside the kitchen.</p> <p>If it was extended to other areas of the holding.</p>
<p>Evaluate</p> <p>How does the design meet the Ethics of Earth Care, People Care and Fair Shares?</p>	<p>What Earth Care outcomes have there been?</p> <p>The grey water will be used to water vegetables that have a high water need and not the hedges that do not need watering unless the weather is very dry for a long.</p> <p>The design will contribute to the growth of the tomatoes and may improve them through the additional nutrients in the grey water.</p> <p>The plants in the polytunnel can be inspected while the grey water is dealt with.</p> <p>The surplus ceramic drains have been given a use.</p> <p>Using grey water has a low energy demand compared to mains water.</p> <p>What People Care outcomes have there been?</p> <p>There will be an element of satisfaction in managing what previously was a waste material.</p> <p>There will be more time spent in the polytunnel.</p> <p>The slower process of carrying the water, rather than pumping it, can be meditative.</p> <p>Using the pipes keeps the grey water away from food crops like lettuce.</p> <p>What Fair Share Outcomes have there been?</p> <p>Mains water does not need to be used for watering the tomatoes, and eventually other plants, this will reduce the consumption of energy required to treat water to drinking standard.</p>	

<p>Tweak</p> <p>What will you change to make it even better?</p>	<p>More drains in other beds in the polytunnel to be able to cope with more people being on site and using the kitchen.</p> <p>Extend to include washing up water which is currently put into the hedges.</p> <p>Extend into other areas of the vegetable beds.</p> <p>Put a sieve under the outlet pipe to collect food bits.</p> <p>It would be interesting to see if lids on top of the drains would make a difference to the humidity in the polytunnel and have an effect on mildew.</p> <p>Improvements to the mini-design: Including headings in the Observation Section. Additional questions in darker blue.</p>
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Principles

Observe & Interact	Each element performs many functions
Catch & Store Energy	Each important function is supported by many elements
Obtain a yield	Using biological resources
Apply Self regulation & accept feedback	Cycling of energy, nutrients, resources
Use & Value Renewable Resources & Services	Small-scale intensive systems;
Produce no waste	Everything works both ways
Design from patterns to details	Work with nature rather than against
Integrate rather than segregate	The problem is the solution
Use slow & small solutions	Make the least change for the greatest possible effect
Use & Value Diversity	
Use edges & value the marginal	
Creatively Use & respond to change	

I have used the Individual Design Assessment Form to provide structure to my overall reflection of this design.

ACCREDITATION CRITERION 1: Demonstrating design skills

(for further guidance, see section C3, page 5, in the Guide to Accreditation Criteria)

		What's gone well?	What could have been done differently?
1a	The design uses an appropriate design framework or intentional process accurately	As part of a separate design looking at how to engage teenagers in the design process I created a template for them to follow to carry out a design. I chose OBREDIM as the framework as this is relatively straight forward. In applying the template I feel that the framework works well.	I feel I could have been more detailed in the Boundaries section, particularly with regard to photographic evidence.
1b	It references the permaculture ethics appropriately	I included the Ethics at the end of the design, my thinking here was to ensure that a teenager would consider how their design impacts on the areas of the three ethics. In terms of the People care ethic I like the thought of spending more time in the polytunnel as a yield.	I could have included an Ethics section in the observation or evaluate sections.
1c	The design uses permaculture principles & theory that are appropriate to the situation	I chose 5 of the ethics to fit the template, I particularly like the "problem is the solution" and "making the greatest change for the least possible effort" in this context. I am pleased to have used some of Mollison's principles as I tend to gravitate towards Holmgren's.	Other principles I could have included are: "obtain a yield", (I like the thought of this with regard to wild thinking), "cycling of energy, nutrients and resources"
1d	It uses a variety of tools to suit the needs of the situation/ design brief	I think PMI works well in this situation as does "what went well, even better if". The client interview at the design stage was effective in coming to the final simplest design.	The number of tools is restricted by the template, if I was using this with teenagers, I may well guide them towards other tools as necessary.

1e	The design is intelligible, coherent and effective, meeting the client's needs	This is a simple design with a simple outcome.	
1f	The documentation is appropriate to present to the clients and others	I have highlighted the questions I have answered which I would hope identifies that the appropriate questions have been answered, particularly at the observation stage.	I feel that I could have taken more photographs as I went along, I needed to be thinking about recording the design as well as the design itself.

ACCREDITATION CRITERION 2: Applying Permaculture design to projects

(for further guidance, see sections C2, page 4, and C4, page 6, in the Guide to Accreditation Criteria)

Areas of Application (delete all that don't apply)

Site / land development

		What's gone well?	What could have been done differently?
2a	SURVEY There is a clear explanation of how the design brief was investigated through surveying the situation and gathering the information.	I feel that the questions in the observation stage make the design brief investigation clear.	I could have suggested tools included in this and other sections.
2b	ANALYSIS & DESIGN There is a clear explanation of how the design decisions and	I feel the PMI process and having 4 different design ideas at the evaluate stage allows for the decision regarding the final design to be clear and feeds into the client interview.	

	solutions were developed.		
2c	IMPLEMENTATION & EVALUATION PLANS The solutions are relevant and appropriate to the area and design brief.	Given the simplicity of the final design implementation planning was straight forward as was maintenance. The final design solves the problem of using mains water in the polytunnel and what to do with the grey water from the kitchen.	

ACCREDITATION CRITERION 3: Learning from and developing your permaculture practice

(for further guidance, see section C5, page 7, in the Guide to Accreditation Criteria)

	What's gone well?	What could have been done differently?
3a The design report includes an evaluation of the design's effectiveness .	<p>I have used this form to evaluate the design's effectiveness. I like the simplicity of the final design and the fact that it also increases time within the polytunnel, so allowing for other tasks to be identified.</p> <p>I also like the focus back onto the ethics at the end which has an element of reflection of the design in a wider context.</p>	I could have included a reflection section at the end of the design with questions like "What is your favourite part of the design?", "Which part was most fun?" or "Give yourself a score out of 10 for the design.".
3b There is critical reflection on how you used theory, design tools, and processes, and some next steps for this design.	<p>My critical reflection is mostly through the "What could have been done differently?" section of this form.</p> <p>The two main areas being including other tools and further use of photographs in the recording.</p>	I would like to have a similar question approach to other types of design.

3c The design shows how design skills and competence have progressed and some next steps for design practice.	This is my first land-based design. The simplicity of it has given me some confidence for approaching a more detailed design for example focusing on our vegetable growing or designing a forest garden.	Although, with this design, it was a decision to prescribe the tools to use and keep them to a minimum, I feel with other designs I need to be thinking about how to use tools more beyond the survey / observation stages.
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