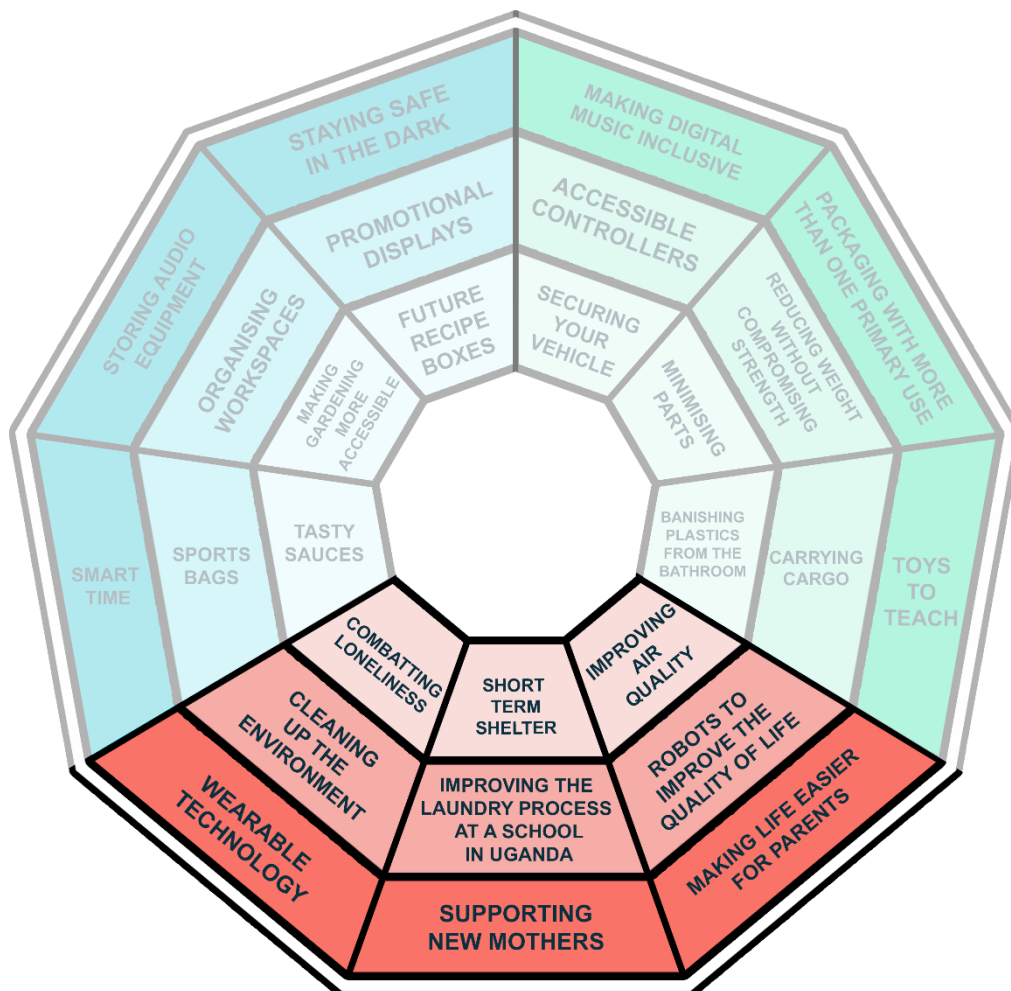


INSPIRED BY INDUSTRY

**Banish single-use plastic from your
bathroom**

#InspiredbyFussy



fussy.

Introduction

This context has been put together to allow for a range of opportunities for students to explore sustainability, the impact of materials and manufacturing on the environment, as well as product design. The context is a complex one and schools may wish to explore slight alterations to the theme, for example, replacing plastics, possibly not even within the bathroom, or making small, subtle changes. It opens up the opportunity for discussion around sustainability and the importance of design decisions, but also conflicts and challenges such as changing habits of users and making compromises.

Materials

There is an obvious exploration of plastics in this context, both positive and negative impact. Fussy still use plastic in their case for their refillable deodorant (albeit recycled plastic) and is intended to last a lifetime. There is also the opportunity to study and explore plastic alternatives such as bamboo, wood, fabrics and more. You may also wish to experiment with recycled plastics and explore compostable materials too.

Potential outcomes

The outcomes may be conceptual and may not be fully working. For example, producing a fully working refillable lip-balm may not be possible within school, and as such, the direction of the unit may be conceptual design with a focus on material understanding and CAD. Equally, you may focus on producing bathroom organisers to allow soaps to be used in the bathroom. The context may allow for an arguably tenuous vehicle for teaching skills whilst developing a deeper understanding around the decision making process linked to sustainable and responsible design.

It is important that students are given some freedom within this context and so outcomes should vary between students / groups. You may decide to limit your class to 2-3 outcomes however.

There is an opportunity to look at fabric-based outcomes and explore textiles here. Wearables for the arm, head, waist etc will all involve cutting patterns, working with fabrics to create outcomes. While incorporating the electronics is advisable, again, this should be viewed as a prototype to test a concept. You may wish to explore making a 'what it looks like' prototype with students – or may be an opportunity for CAD work.

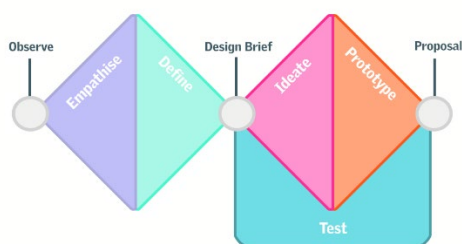
Examples may include (but not be limited to):

Holder for face cloth, soap dish, wooden duckboard, concept refillable shower gel, single-family toothbrush with replaceable heads, attractive toilet brush.

Consider sharing work on social media using the hashtag #InspiredbyFussy

Design cycle

The design cycle shown can be worked through in a range of orders. It's advised that the areas are revisited throughout the process depending on your time. We advise that a graphical representation of thinking convergent and then divergent may be shown to your students.



The following are some tips as to the type of activities you could do with your students.

Empathize stage

- Students should be introduced to this term if not already familiar.
- At the start of the context, students should be thinking wide with their thoughts, exploring the problem and not deciding too soon what they 'want to make', but observing what is happening.
- This observation (may be a series of photos from their own bathroom, or of someone else's, a survey / list of all products and processes used, possibly a 'similar' venue e.g. a spa / hotel etc) should allow them to 'spot problems'.
- The Big Life Fix [HERE](#) is fantastic for showing empathetic designing. Throughout the process the designers try to immerse themselves in the problem and regularly get feedback from the clients. Observing others is really important rather than just asking people what they want as they may not know!
- If analysing the research, and spotting problems is hard, you may want to do this as a group activity and think of a longer-term impact and chain. For example, using limescale remover and a scouring sponge on glass. The limescale remover is likely to be in a plastic bottle and a plastic sponge, with potentially harmful chemicals going into the water stream. After some research it may be that simply wiping the glass after each clean can stay on top of the limescale and so (later on) identifying that a reusable 'squeegee' is better in this instance. However, the initial observation may not have achieved this aim. The teachers' role in this instance is to drill down deeper and get students thinking of associated elements.
- Students should get information to help them later in the challenge. They may present this in any way they wish.
- Observing or researching historical approaches may help here. For example, it is only in recent times that we have shifted away from using bars of soap, to liquid soap. What did bathrooms look like previously? Could students ask their grandparents what they used in the bathroom?
- What is preventing people from using more ecologically-friendly solutions? Find out what they don't like about things such as bars of soap, bamboo toothbrushes etc.

Define stage

- This is where students try to get the real root of the problem and decide what they are going to do.
- This is arguably the hardest stage, as students define the exact problem without coming up with a solution (yet!). It may be an improvement on something, rather than a whole new product.
- The context is big, and potentially daunting to students (and adults!). Making a small difference is still making a difference. So if removing the amount of plastic is possible, then great. The context is largely about thinking creatively.
- The '5 why's' may be a good resource to run through with students. You could even pair them up to do this with each other at the define / empathy stage [VIDEO HERE](#)
- For older students, this case study from [DESIGN COUNCIL](#) is great to show how to define the problem and come up with innovative solutions.

- This is a good opportunity to introduce contextual challenges to students and get them to consider all aspects of the problem. It will undoubtedly need some support from you as a teacher. Please get students to share their thinking as clearly as they are able.
- Get students to create a specification. Whilst templates / writing frames are fine at KS3, you will want to avoid this at KS4. Consider using columns such as 'Essential', 'Desirable' and 'Definitely not'.

Ideate stage

- Encourage students to think wide initially. No ideas are too silly, too big. For example, if they are looking at shower gel, it may be that they look at refills, but equally a holder in the shower for a bar of soap (as making the shower messy may be what is putting people off using bars of soap).
- Ideas can also be produced through making. Get students experimenting with materials early on. The bathroom is a hostile environment, so finding something that fits the humidity, hard surfaces, easy to clean etc may open up the opportunity to explore new/alternative materials.
- There are a range of videos on YouTube to help students with sketching techniques. [HERE](#)
- Product design sketching tutorials can be found [HERE](#)
- The Design Museum have some nice, short, case-study videos [HERE](#)
- Students should be encouraged to sketch on anything to hand – envelopes, packaging etc. This may be a good method to stop students potentially being daunted by blank paper.
- Get students to keep sketching. It may not be the whole item, it may be parts of it – a way to connect to tiles without damaging them.
- Encourage zoomed-in parts of the product to focus on details and annotation.
- Annotation may be things they like, things they are not happy with and explanation of parts that are not clear from the picture.
- A range of techniques such as 2D, 3D, Exploded and cross sections are good.
- Additional research may be needed at this stage. What size may it need to be to fit in an average bathroom cabinet or washbag? Will it be a 'post-able' item (like Fussy) and so need to fit into a letter box?
- Consider a handling collection or a range of 'alternative' bathroom products to inspire students.
- Ideas don't have to be revolutionary and completely new. Their products need to do something different or be better than what exists. Maybe a new target user? Fussy appeals to a younger demographic. May they want to target sportspeople, travellers / commuters, people on vacation, camping trips etc. Consider 'development' with your class. Maybe they can start with an existing product and improve it. This [VIDEO](#) is a good introduction to this for older students / teachers.

Prototype stage

- A nice video from BBC Bitesize is [HERE](#)
- This short video from The Design Museum looks at the journey a designer had to design and make a collapsible bottle. [HERE](#).

- There are a number of videos by Jude Pullen from Big Life Fix [HERE](#) on how to create shapes in card. However, many may not have access to materials / tools and so C.A.D. may be more suitable.
- The following are all suitable CAD programs:
 - [AUTODESK](#) free for schools/students. Mac & Windows
 - [CREO](#) free for schools/students (PC only)
 - [FREECAD](#) free for schools/students
 - [ONSHAPE](#) free for schools/students
 - [SKETCHUP](#) free for schools/students
 - [SOLIDEDGE](#) free for schools/students
 - [SOLIDWORKS](#) discounted for schools/students
- There are some good Autodesk Fusion tutorials [HERE](#) and TinkerCad [HERE](#)
- It is worth discussing with students WHY to make a model. What things could it test?
 - Size, comfort, aesthetics etc. Choosing the correct model for the correct test is important.
- Throughout the process, ensure students follow procedures for health and safety and understand the process of risk assessment.
- Prototyping is ideally part of an iterative process, rather than a one-off make. E.g, if you are looking at a floss holder as too much floss is wasted when wrapping around your fingers, the size of the holder means a 3D print will be quick to design and print (and ultimately test).

Test stage

- Although this is the final stage of the design cycle, encourage students to evaluate throughout and act on their feedback (and consider the feedback of others too). It is not a final thing, but a step to improve further.
- Consider AR (Augmented Reality). If you use windows, PAINT 3D allows you to open .obj files and students can then view their design in-situ to see how it may appear.
- To help students that are **reluctant to improve their idea**, consider prompts such as “What if money was no object?” “What if you could only use locally sourced materials?” “What if it had to be made in 1 day?” “What if you needed to make 100,000?” “What if it had to be made cheaper?” “What if it had to be made lighter?”.
- This could be a good opportunity to explore mathematical content by getting students to calculate amount of material used, costs etc. Some programs such as Autodesk Fusion allow you to calculate the amount of material you have used [HERE](#). This is potentially really important to see if your product/solution is a scalable solution and will make a positive impact.
- How can students get feedback from users? Could they use technology to get a wide range of feedback – e.g. a Google Form? A poll on twitter (X)?
- Get students to think about the main problem they identified earlier – does it actually do that? What proof do they have?
- Consider a Dragon’s Den format like Fussy walked into where the student is grilled by staff or peers. They may wish to produce a presentation to go alongside it to help with the pitch.
- Prompts for younger students e.g. ACCESS FM are suitable approaches. For older students they need to consider a wider range of aspects such as scalability, manufacturing techniques and limitations, ergonomics etc.

Focused Tasks

‘Casting a soap dish’	‘Duckboard’	‘CAD screw threads’
Using materials such as Jesmonite, create a soap dish to hold bars of soap in the bathroom. An opportunity to explore mould making, mathematical ratios and more.	Either as a mini soap dish, or full sized for the floor, explore methods of cutting and joining wood to create a duckboard. What wood is suitable? What finishes are also preferable for its use?	Cosmetic bottles may feature flip lids, press on tops, screw-on lids and more. Creating an external and internal screw thread in CAD can be useful for a range of processes. Design, 3D print and test a screw thread.
‘Promo holder’	‘Wooden squeegee’	‘Print finishes’
How can you display the new 15g mini Fussy deodorants in shops? (photos on next slide) Roughly the size of a mini glue stick / lip balm, design and make a hanger that displays the product and allows users to remove to buy. Can you do this from a single sheet of paper / card?	Create a wooden-handled glass ‘squeegee’, used to wipe clean shower glass. The handle can be turned or made by lamination. A range of techniques can be incorporated and finished explored.	Look at how to represent a range of print finishes such as foil application, spot varnishing and embossing (some of which are used in the fussy packaging).

Investigative and Evaluative Activities

‘Understanding green terms’	‘Packaging info’	‘Alternative materials’
Do you know your compostable from your biodegradable? What’s the deal with microplastics? When should a mobius loop be a green dot? What is greenwashing? The Fussy case is made from recycled plastic and the refill is compostable. With so much information and terminology around sustainability it is easy to get lost and confused. Look at the logos and terms to get a better understanding of what they all mean for consumers and designers.	The Fussy packaging is also eco-friendly, with water-activated glue, recycled materials and eco-ink. What information is required on products that are designed for the bathroom? Look at the symbols, ingredients and more that are printed on the packaging of common bathroom products.	Banishing single-use plastic means that it may need replacing with another material. What alternative materials are being developed, and what are the advantages and disadvantages of them for consumers, designers and manufacturers? Research (and get samples where possible) of a range of alternatives that could be used in place of plastics.

