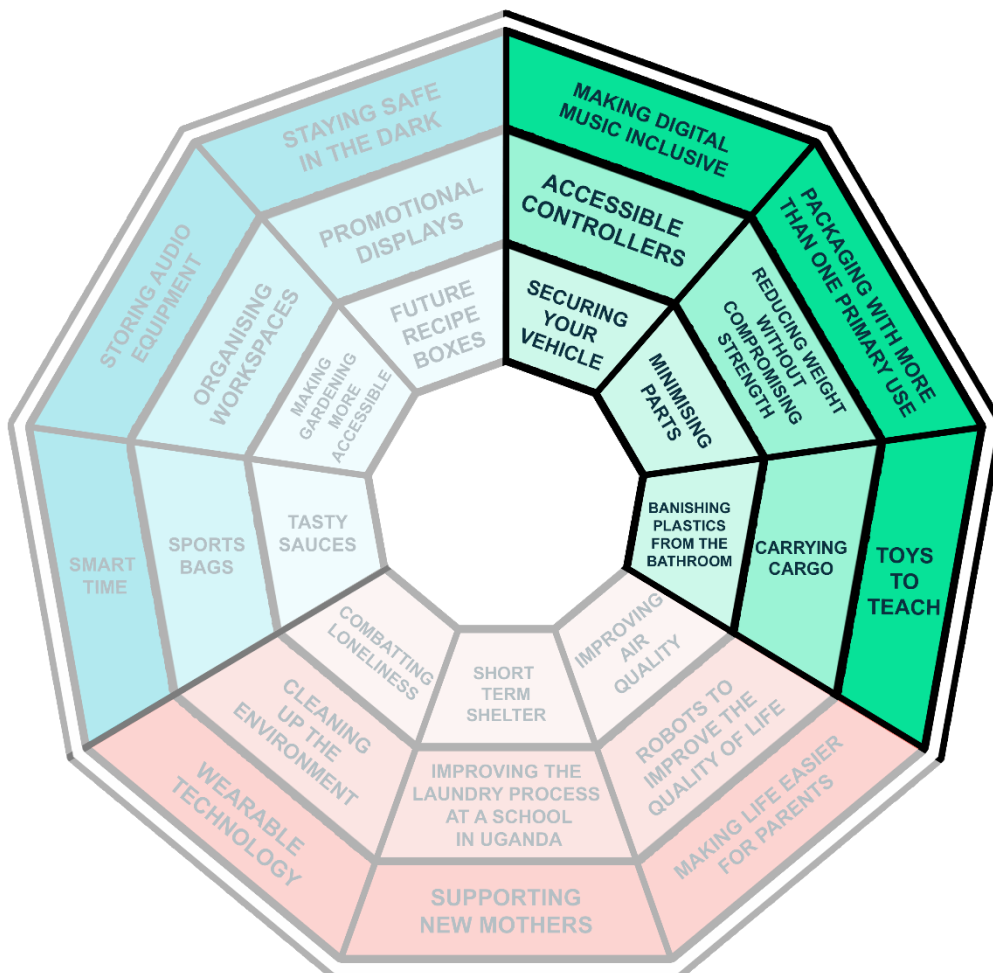


INSPIRED BY INDUSTRY

Packaging with more than its primary use

#InspiredbyBulletproof



BULLETPROOF™

Introduction

This context has been put together to allow for a range of opportunities for students to explore the impact of, and potential improvement of, packaging. Whilst it is likely to feature ideas and prototypes using card and paper, it opens up the possibilities for exploring alternative materials such as mycelium or mushroom packaging. Alongside this, the concept of a secondary 'use' brings in design skills and creativity.

Materials

There is an obvious link to card in this context, but also an opportunity to look at, handle, and potentially make your own alternative materials. Even the use of fabrics, or timber may mean that rather than packaging being wasteful, a more resistant material means it can be enjoyed in its secondary function for a long time. Polymers will also be a good material to explore and knowledge and understanding of the 6R's can be further explored with this packaging context.

Potential outcomes

There is the possibility of working with a local company for this context. Every company is likely to want to either reduce packaging or to utilise the packaging in some way. You may be able to get packaging waste / samples from a local company to give further context to this brief. The outcomes will be prototypes and will not be able to be produced in such small print runs that commercial processes can be utilised, however, the main challenge is likely to occur with considering the secondary 'use'.

Examples are widespread and may include things like (but not be limited to):

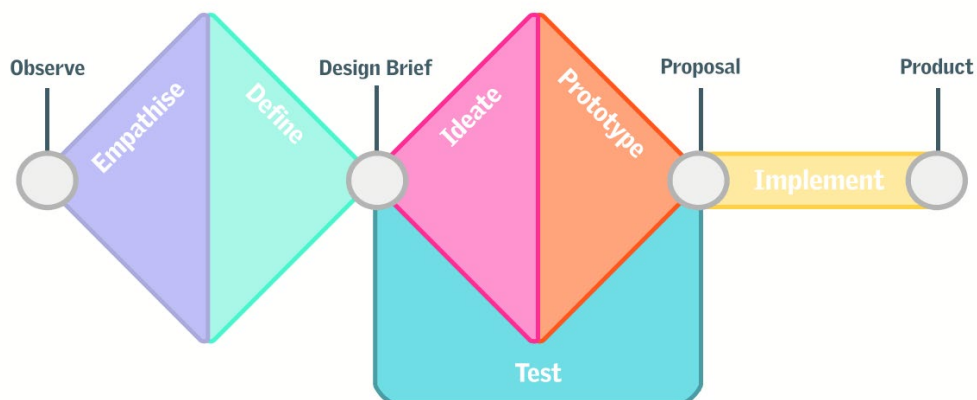
Plantable packaging, a toy from a box, ice lolly drip-catcher, collapsable tissue box, trainer box/shoe display stand...

You may want to limit the materials that students can use (e.g. single corrugation card) to make the designing and manufacturing easier to manage. This also lends itself well to a group-work exercise whereby the group presents their ideas to the company (if applicable) at the end, thus reinforcing and developing their communication skills and presentation confidence.

Consider sharing work on social media using the hashtag #InspiredbyBulletproof

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.
- Access to users / companies that provide packaging is useful. 'More than its primary use' may not simply mean the packaging is used for something completely different at the end of its natural life, it may be that it serves another purpose that to protect, promote or preserve. You may wish to explore these 3P's initially before beginning.
- 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 and identifying problems or opportunities.
- Trying various aspects as a group can also be useful – using and analysing existing packaging, for example. Consider getting students to bring in examples that they think is clever or that they hate.
- Collaboration software such as Miro, or Google/Microsoft collaboration can be good to use to collate ideas from all.
- Students should get as much information to help them later in the challenge. They may present this in any way they wish.
- When looking at a range of different furniture applications it is an opportunity for students to look at Gantt charts and similar, to identify comment features or attributes as well as planning their time and highlight any possible issues that may arise.
- Bulletproof have a website [here](#) that may help to show a range of their work.
- Consider focusing on 3 areas for students to choose from, and then go through first-hand the process of purchase, consumption and disposal. For example, look at ice cream – how are they packaged in different way, how do you unwrap them, what problems are there... This can be challenging and often easier to do as a group.

Define stage

- This is where students try to get the real root of the problem and decide what they are going to do.
- There may be a whole range of problems identified. Identifying the user and their needs as well as constraints may help.
- For this stage, you may possibly constrain it to ensure students are working with materials and processes you wish to cover in the unit of work. There will still be plenty of opportunity for designs, testing, iteration etc.
- Consider working in groups, or in pairs so that students can critique each others' ideas.
- Whilst some may struggle to define a completely unique idea/space, they should be reminded that their product/outcome simply needs to be better than, or different to what is already out there. Many students will try to think of something that has never been done before and can be disheartened if they cannot think of anything. At this stage it is defining the problem or space they are wanting to design into.

Ideate stage

- For the ideation stage, you may be drawing on existing ideas (e.g., improving an existing product) rather than starting from scratch.
- Consider giving students the initial freedom of how to approach their ideas. For example, it may be CAD, a card model or a sketch. Giving students autonomy of how to approach their designs will prevent them feeling restricted. Working in groups can help generate creative ideas.
- You may wish to show students examples of outcomes such as those in the slide deck, or this from Puma – showcasing that ideas may take a different turn completely if they think wide with their ideas initially. [Puma's Clever Little Bag](#).
- Consider showing students how to create simple packaging using (for example) a vinyl cutter / laser cutter. You may want to have some packaging templates already produced for them to edit / develop, rather than starting from scratch. These can be easily downloaded from the internet from sites such as [Template Maker](#).
- Encourage students to annotate elements of their drawings – things like WHY it's that big, WHY it's that shape, WHY it is that material etc.
- A range of techniques such as 2D, 3D, Exploded and cross sections are good. It may be that models are used to create ideas early on. Due to the nature of the brief, paper is likely to be a useful, cheap modelling material initially.
- CAD programs will be of great use here if possible. It may be that you allow students to decide when to jump onto CAD (programs like Techsoft Design) or leave it until ideas have been developed further.

Prototype stage

- Getting students to realise when and why to make a prototype is key. What are they looking to prove / disprove? Linking the prototype method with the problem is a good task. In the video they suggest any realisation of a design is a prototype, even small-scale trials.
- Prototypes may be mechanical or structural models, test rigs, mock ups, painted models, or CAD models and/or assemblies.
- The following are all suitable CAD programs:
 - [ADOBE](#) discounts for schools/students. Mac & Windows
 - [CORELDRAW](#) discounts for schools/students. Mac & Windows
 - [SERIF AFFINITY](#) free for schools/students. Mac & Windows
 - [TECHSOFT](#) discounts for schools/students. Windows
- Consider asking stakeholders/companies/users to give some feedback on the prototypes, as they are being developed and at the testing stage.
- Whilst the CAD models produced may be fairly simplistic in their nature, it is a good opportunity for them to model and go through an iterative process. Cutting should be fairly quick and so variations can be made quickly and cheaply. At the same time, an understanding and acknowledgement that time and resources are costly, and so trying to get things correct before printing/cutting is beneficial.
- Investigating properties of materials lends itself well to this context. Students will naturally test items in the next stage, and so learning about a range of properties is useful. This may be thickness/weight of card, print finishes and more.

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.
- Test with different people to ensure you get realistic feedback. Observe how users are interacting with the product and use these observations to add more detail to your questions for feedback. Do they understand the secondary use of the packaging? How could it be made obvious without reading instructions?
- Consider getting students to label feedback as 'subjective' or 'factual'. They should explain whether they have decided to act on the feedback given or not, and why. Having 'thick skin' as a designer is important, and being able to take feedback / criticism is part of the process. However, the feedback may often be someone's opinion and they may not agree. This is where a range of user feedback is useful.

Focused Tasks

'Mycelium packaging'	'Textiles nets'	'Net exploration'	'Print finishes'
Students are to create their own mycelium packaging for a product. Students need to think about creating a suitable mould similar to their product of choice before using that mould to create the mycelium packaging (similar to that of foam or cardboard inserts in typical packaging).	Consider an alternative material when working with nets such as a fabrics. Students to make a light up lantern using a net design, CAD, the laser cutter and sublimation printer.	Students could experiment with a range of different net designs making paper mock ups from examples at websites such as http://www.korthalsaltes.com Students should make some by hand and some using the laser/vinyl cutter to experiment with process and accuracy. Students should be challenged to plan and make their own net developing some of these existing shapes.	Representing print finishes and techniques such as foil printing, spot varnishing, folding can be done using techniques in the classroom. Experiment with ways to do this so they can be interpreted on final prototypes.

Investigative and Evaluative Activities

'Packaging'	'Cardboard structures'	'Alternative packaging materials'	'Handling collection'
Gather examples of existing packaging for students to explore and consider. These should be from a range of products and as varied as possible. Packaging that is constructed using a net would be preferable as students would then be able to take these down to their flat nets to explore how they were made and consider things such as tessellation to reduce material waste and strength of the packaging.	How strong is card? This will take the job of testing how strong cardboard can be, especially when laminating. This is a classic engineering challenge where students are tasked to create the strongest cardboard bridge spanning between two tables. The bridge will need to be freestanding (so not attached to the table in anyway) and all students will have the same distance to span and the same amount of cardboard as a starting point. Once built, weights can be used in the middle of the bridges to determine whose was the strongest. Discussions to be had along the way to understanding how to create strong structures and how to create strength specifically in card.	Students are tasked with an investigation into alternative and new forms of packaging materials including things such as food packaging. Students are taken through some of the new technologies and materials that are being experimented with to reduce of use of single use materials wherever possible. Examples such as mycelium, seaweed packaging, cornstarch and bagasse.	Get some examples of toys that can be changed to a different function of a different shapes. Examples such as Transformer toys, magnetic building blocks, shape shifting cubes etc. Allow the students to handle them and consider how they change shape, what joining methods are used and discuss how they could incorporate them into their own products.

