**DT + Design Technology + HASS**

**YEARS 5–6**

 **Title: Beeswax wrap project**

This project is an example of a challenge-based learning task that has the aim of reducing schoolyard and community waste. It is based on the results of inquiry questions about students' own lives in relation to community and schoolyard plastic wrapping waste. The project creates opportunities for students to design, create, market and sell a plastic wrap alternative, and to work with a local business or community group that supplies some materials.

This lesson was devised by Trudy Ward, Clarendon Vale [Primary](https://adsei.org/) School, Tasmania.

**Preliminary notes**

Following my students' research into the negative effects of plastic wrapping, we set ourselves the task of developing **beeswax** wrap as an alternative to it. That was possible because a local apiary (Wellington Apiary) donated free beeswax to the project. If you are not lucky enough to have a local apiary that would donate beeswax (!), you could develop another alternative wrap, and search out a local group or business that might become involved.

This project can be undertaken as a term project or as a year-long project, depending on the level of interest and the goals that are set.

Community links are invaluable in the successful completion of such a project. Before you begin, though, it is a good idea to save time by pre-determining contacts for possible sponsorship or donations.

**Learning intentions**

* Collect data about a real-world plastic waste problem.
* Store and organise and interpret the data in a meaningful way that will inform the project.
* Investigate, design and create an alternative product to plastic wrap, if possible using links with the community to help bring the project to fruition.
* Market and sell the alternative product.
* Evaluate the process.

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| **Notes for project preparation** **Your budget**Assume that your school budget is limited, and that creative thinking will be required. Some items will need to be purchased for the initial set-up and you will need to account for these in the budget total.(For example, for beeswax wrap you will need pinking shears to prevent fraying fabric and for aesthetic purposes, some initial fabric, cotton and initial roll of beeswax. Total cost of such initial materials approx. $110.00.)**Encouraging sustainable practices**To provide an eco-friendly link to sustainable practices, ask students to put out a call for recyclable resources that could be used. (Beeswax wrap examples might be cotton fabrics, buttons, an iron and ironing board, an oven tray, baking paper and extra scissors.) **Links with the community**Communicating with a local business (as a local apiary did with the beeswax wrap example) may be feasible.This type of community based project is supported by [Sanders (2018),](https://www.sagepub.com/hi/nam/school-family-and-community-partnerships/book242535) who believes that in today's busy society, community, family and schools should all work together to provide the necessary experiences and support to ensure that students are active and informed citizens in society. |

# Suggested steps

**Set the scene**

1. Advise your students that you are going to pose inquiry questions about their own experiences related to schoolyard waste, and that you will then collect the responses as data that will inform **practical action** to solve a problem.
2. Discuss with your students some ways to collect, store and organise the answers given (the data) so that data interpretation will be easy to achieve. Also talk about the kinds of data representation that might be most useful/meaningful for the task.
3. Investigate simple scheduling software to be used later.

**Start the process**

1. Present a question such as 'How can we reduce the amount of plastic wrap waste in our playground?' Gather the response data in the organised way as previously discussed, and work with the students to create representations of it. Discuss with students how the presented data might inform the project task and its requirements.
2. Discuss and decide on the roles/tasks required to achieve the desired project outcome, and divide the students into these groups, being mindful of any access and participation issues.

Product/market research and related data collection, storage, organisation and interpretation, should be included in the process.

**Risk assessment and management**

1. With this type of project comes risk and the need for risk management. Ask students to identify potential hazards in relation to the project. Examples for beeswax wrap might include burns from the heat source, cuts from scissors, tripping over cords, stealing from stall if unattended, sore wrist from heavy iron, a crossing-road injury or lost students if travelling outside of school for project. Students add strategies to mitigate the risks.

**Schedule the tasks**

1. As a class, create a timeline/schedule to support students' appreciation of the time each group will have to complete their tasks. It will also provide students with a visual representation of the schedule and a way to monitor their progress against the key tasks. Here is an example used for the beeswax wrap project at Clarendon Vale Primary School.



Scheduled tasks along a timeline (beeswax wrap project)

The schedule has three main stages:

* 1. Organisation into groups and determining roles, budget, risk and purpose. (What will success look like for teacher and students?)
	2. The doing component (for example, logos, making of wraps, research for price point, target audience and profit margin, marketing, preparing for a forum).
	3. Successful completion (for example, of wraps, attendance at statewide forum/market stall, feedback and evaluation rubric/survey. A forum (market stall) provides the students with a reference point for the finished product and through accountability and goal-setting work as they would in the real-world setting; as part of a team.

**Use a HAAS Economics and Business subjects focus**

1. Students investigate how consumer choices are informed both by price and by information received or perceived. Your students could do this through the selling strategies and advertising methods that they use to promote their product. Students could also create graphs showing buyer preferences for the end product/s.

# Discussion

**This is an example based on the beeswax wrap project. It can be adapted to your own material/product as necessary.**

Digital Technology focus

* Whattype of packaging is most used for lunches at school?
* What is the processfor making a beeswax wrap?
* What designs were most popular/least popular? How do you know?

Design Technology focus

* What did your investigation of materials reveal?
* What makes beeswax a useful material for the creation of wrapping?
* What were some of the safety risks with this project? How did you ensure the safety of you and others?

HAAS Economics and Business focus

* How did you come up with an appropriate price for your product? Were you able to sell at a profit?
* How did you market your product to appeal to a range of consumers?
* How did you market your product to the end consumer?
* What did you learn through marketing and selling your product?

# Why is this relevant?

**First, some definitions**

**Acquire data**

This refers to the methods we use to collect and access data from a variety of sources.

Students can generate various kinds of data through their own experiments, surveys and investigations.

**Store data**

To store data we record it in a format that allows it to be easily accessed or obtained.

Students could describe how the data they have acquired can be stored in different ways, using different representations and/or software. Selection of the most suitable representation is important.

**Organise data**

Organising data refers to the way we order, sort and arrange it to assist us with interpretation in different contexts.

**Interpret data**

To interpret data, we use data and its characteristics, properties and patterns to form a conclusion or derive some meaning.

Students can work with data that requires some simple processing, using software. This could be in the form of things such as simple spreadsheet calculations or using data in code. They draw conclusions about the data as a result of this processing.

# Assessment

**Formative**

Journal entries: Students document their journey through the project using written, verbal and visual modes.

Peer feedback: Students create an electronic survey (eg with Google forms or similar) or sheet asking for feedback about their effort throughout the project.

Annotations: Students annotate their designs including size, materials.

**Summative**

Online survey (or other electronic or paper survey) results

Final product suitability

Self-reflection records

Rubric results

Customer feedback

Reviews

Profit

# Australian Curriculum alignment

## Digital Technologies

## Years 5–6

Acquire, store and validate different types of data, and use a range of software to interpret and visualise data to create information (ACTDIP016)

Define problems in terms of data and functional requirements drawing on previously solved problems (ACTDIP017)

Plan, create and communicate ideas and information, including collaboratively online, applying agreed ethical, social and technical protocols (ACTDIP022)

Design and Technology

Year 5

Students will evaluate the sustainability implications of materials, systems, components, tools and equipment, for example materials can be recycled or re-used to reduce waste (ACTDEK019)

Students will test a range of materials, components, tools and equipment to determine the appropriate technologies needed to make products, services or environments (ACTDEP024)

Students will work safely, responsibly and cooperatively to ensure safe work areas, for example the safe use of irons and scissors (ACTDEP026)

Mathematics

Years 5–6

Use efficient mental and written strategies and apply appropriate digital technologies to solve problems (ACMNA291)