

Horticulture STEM Design challenge

Design and Technologies (Process and production – creating solutions using Design Thinking)

YEAR 7	<p>Investigating and defining Recognise a need or opportunity. Respond to or develop a design brief, and identify materials, components, tools, equipment, and processes to create designed solutions</p> <p>Generating and designing Generate, iterate, and communicate design ideas processes and solutions using technical terms and graphical representation techniques, including using digital tools.</p> <p>Producing and implementing Select and use suitable materials, components, tools, and equipment to safely create designed solutions.</p>
YEAR 8	<p>Investigating and defining Identify a need or opportunity. Respond to or develop a design brief, and identify materials, components, tools, equipment, and processes to create designed solutions</p> <p>Generating and designing Generate, test, iterate and communicate design ideas, processes and solutions using technical terms and graphical representation techniques, including using digital tools.</p> <p>Producing and implementing Select, justify, and use suitable materials, components, tools, equipment, skills and processes to safely create designed solutions.</p>

TASK DESCRIPTION

Individually or in pairs, students use the design brief provided and “moonshot thinking” to generate possible STEM solutions for the challenges of fruit picking in horticultural businesses. They select a suitable format to record and communicate their design ideas. Students then select their final option and create and present their designed solution.

BACKGROUND

Guide students to identify the challenges associated with commercial fruit harvesting. Where possible, carry out some manual fruit picking to help identify the practical issues. Watch the Landline story on fruit picking:

Radical shake-up of wages for fruit and vegetable pickers | Landline | ABC News

youtu.be/vpzScVBXu50?si=i3F1j0rKllnWVBa9

Teachers could select one focus for their class for the design task, such as designing an automated fruit picker.

Alternatively, teachers could guide students to select from the range of harvest issues for their designed STEM solution. They could consider issues such as sourcing pickers, wages, accommodation, repetitive and physically demanding nature of the work, protecting fruit from damage, harvesting at the best stage for transport, storage and sale, dealing with “waste” products (eg almond hulls) or undersized and “out of specs” fruit, or preventing bird damage.

Horticulture STEM Design challenge

– Design brief

Purpose

Your task is to design a STEM solution to one or more of the challenges around fruit harvesting in horticulture, working individually or in pairs.

Audience

Your classmates

Constraints

- the solution is a product, environment or service
- the solution addresses a real-world horticultural harvest problem
- the solution can be conceptual or practical but must have some basis in reality (consider providing some “proof of concept”)
- the solution must demonstrate original, creative STEM ideas
- the solution must support farm sustainability (consider environmental, social and/or financial perspectives)

Materials, tools and equipment

You will present your design ideas and final solution in the format(s) of your choice.

It could be

- Word document
- hand written and/or sketched
- PowerPoint
- audio or video recording
- Minecraft design
- round table discussion
- model or prototype
- your own idea – check with your teacher that it will work for the design brief

CRITERIA FOR SUCCESS

THE DESIGN FOLIO

- design folio records at least three annotated design ideas for the solution
- annotations cover positives, negatives and interesting aspects
- folio includes and responds to informal feedback about the ideas provided by an independent source
- all team members contribute equitably to the folio

THE DESIGNED SOLUTION

- final designed solution meets the design brief constraints
- how the solution addresses the problem and/or how it works is described or demonstrated
- information is communicated persuasively
- all team members contribute equitably to presenting the final designed solution

