



Overview

The following activity guide is for use by high school students and educators looking to explore and expand on digital technology concepts both in the classroom and at home. The guide presents one overarching challenge for students to respond to creatively and then supporting activities structured by the steps of the Design Thinking process to integrate cross curricular priorities and help structure their understanding. There is also an extension task to encourage students to apply their understanding to new situations and stimulate further thinking.

Australian Curriculum Links

Year 7 - 8

Digital Technologies

- Design the user experience of a digital system, generating, evaluating and communicating alternative designs (ACTDIP028)
- Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors (ACTDIP029)
- Implement and modify programs with user interfaces involving branching, iteration and functions in a general-purpose programming language (ACTDIP030)
- Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)
- Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)

Year 9 - 10

Digital Technologies

- Design the user experience of a digital system by evaluating alternative designs against criteria including functionality, accessibility, usability, and aesthetics (ACTDIP039)
- Design algorithms represented diagrammatically and in structured English and validate algorithms and programs through tracing and test cases (ACTDIP040)
- Create interactive solutions for sharing ideas and information online, taking into account safety, social contexts and legal responsibilities (ACTDIP043)
- Plan and manage projects using an iterative and collaborative approach, identifying risks and considering safety and sustainability (ACTDIP044)

Before you start

Activity 1

Build an understanding of coding and programming through simple input and output games that use block coding to generate output. Try platforms such as Scratch to build simple interactive stories and understand the basics of coding or Blockly Maze for a simple input and output interface.

Activity 2

Understand and explore different programming languages and their uses. JavaScript, Python and PHP are just three of hundreds of languages that have been created. Try games and platforms such as 'RoboZZle' for JavaScript, Scratch for block coding (graphic coding) or CodeCombat for Python (also available for JavaScript and Lua).

Before you start

Activity 3

Explore “if X then Y” algorithms. There are several options for games which use block coding for this type of pattern, allowing students to test out their sequences and see the output.

Activity 5

Explore and understand the Australian egg supply chain, specifically the steps an egg will take to get from the farm to your fork. Start your research at australianeggs.org.au/farming/collecting-grading-sizing

Activity 4

Practise using Proof by Induction, a technique also used by mathematicians to prove properties of numerical sequences. This can be used to prove the logic of your programming sequences.

Main Challenge

Design and map the distribution journey of an Australian egg from the farm to the fridge using Minecraft Makecode as an interactive User Experience. With the JavaScript editor within Makecode, students are to program the sequence of key events and create the landscape around it.

This activity can be scaled up or down by adding less or more coding detail to each part of the journey. This gives students the opportunity to create an interactive experience for their peers, apply their research on the topic as well as demonstrate what they have learnt about the distribution process.

Design Thinking Steps

Step 1

Observing

Students choose and research their intended audience and existing resources to build an understanding of the audience’s needs. Students research Australian egg production systems and select their preferred production model to outline in their User Experience.

Step 4

Using mathematical skills

Students design and trace algorithms diagrammatically and in English to predict the user experiences with references to input and output.

Step 2

Questioning and Predicting

Students identify specific lines of questioning to define the problem and structure their project. Students predict how users will interact with their product.

Step 5

Analysing

Students test their design and evaluate how it met the needs of the challenge and their chosen audience. Students modify their designs as necessary and publish them.

Step 3

Communicating

Students design the user interface for their project using storyboards or wireframes and present options for design aesthetic to engage users.

Extension Task

Students test their modified designs with their intended audience to gain further insight into audience needs, accessibility, innovation and aesthetic design.