DIGITAL TECHNOLOGIES HUB

Design thinking in context

Years 1–2

Investigating and defining, Evaluating

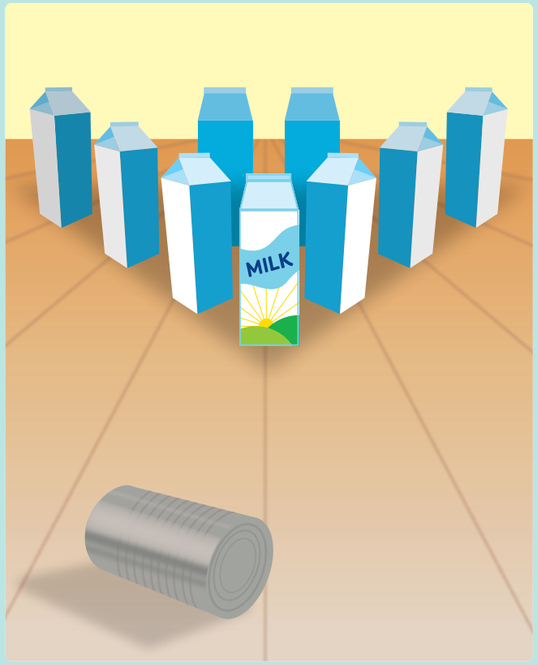
In Years 1–2, introduce the foundations of design thinking by guiding students to investigate and evaluate familiar digital solutions. At this stage, the emphasis is on understanding the needs of known users, which lays the groundwork for future learning. This focus will prepare students for subsequent years, where they will create user stories and define problems, enhancing their ability to empathise with users and generate designs that can be implemented as effective solutions.

Foundation

This concept does not appear in the Australian Curriculum: Digital Technologies – Foundation.

There is related content in Design and Technologies.

Related content



Design and Technologies

Generate, communicate and evaluate design ideas, and use materials, equipment and steps to safely make a solution for a purpose | AC9TDEFP01

Investigating and defining

I can identify problems that my friends, my school or I face and think about how digital systems can help solve them.

Investigating simple problems for known users involves identifying everyday challenges faced by users such as themselves, friends or the school community, and thinking about how digital systems can offer solutions.

The school can often provide examples of digital solutions to investigate. These may include the school library borrowing system, student attendance and home–school communication.

Follow a simple process to investigate digital systems:

1. **Identify a problem or need:** such as borrowing books
2. **Explore a digital solution:** show how the school library system addresses the need
3. **Encourage questions:** How does the system work? How does the system help us? Who is it for?
4. **Represent what they learned:** use photos to show a student new to the school how to borrow a book.

Evaluating

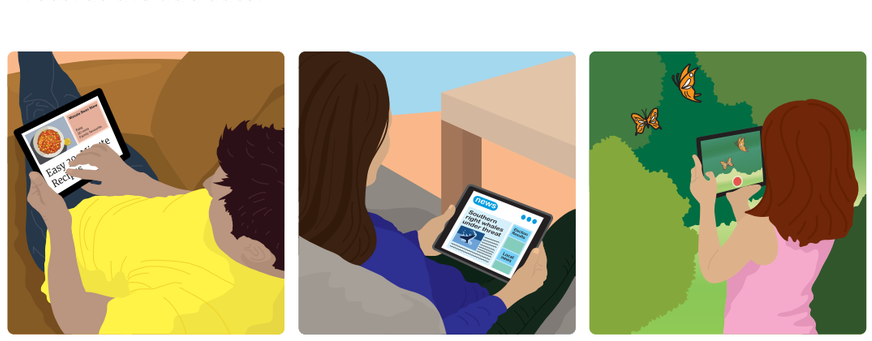
I can describe ways digital systems help meet the needs of people I know, like my friends and family.

Discuss how existing digital systems satisfy identified needs for known users.

Describe how well a digital system meets the needs of users. Reflect on the use of a familiar digital system, for example, the school library borrowing system.

The library borrowing system:

- makes it easy to check out and return books quickly
- keeps track of what each person has borrowed
- records the due date.



Students can explore the needs of people in their family and how a digital system such as a tablet is used by each member.

Choose a familiar digital system. Explore the question, ‘What if we didn’t have this technology?’ They imagine and discuss how tasks would be performed without it. They discuss how a digital system satisfies the needs of users.

Achievement standard	By the end of Year 2, students show how simple digital solutions meet a need for known users.
Content descriptions	Investigate simple problems for known users that can be solved with digital systems | AC9TDI2P01 Discuss how existing digital systems satisfy identified needs for known users | AC9TDI2P03

DIGITAL TECHNOLOGIES HUB

Design thinking in context: part 1

Years 3–4

Investigating and defining, Generating and designing, Producing and implementing, Evaluating

This sequence of three posters illustrates how to use an authentic context to design, implement and evaluate a solution. It shows how design thinking can be applied to the processes and productions skills in the Australian Curriculum: Technologies. The context provides an opportunity for students to produce a working model, applying their understanding of materials and engineering, and also implement the solution using visual programming.

CONTEXT: DESIGN, IMPLEMENT AND EVALUATE AN ALARM SYSTEM

Design thinking (non-linear)

EMPATHISE
Understand the needs of the user in the context of the design challenge.

DEFINE
Define the challenge based on what you learned about the user.

IDEATE
Combine creativity and your understanding of the problem to generate ideas for the design challenge.

PROTOTYPE
Develop a basic example of your preferred design idea.

TEST
Review your prototype against design criteria and user story.

The Australian Curriculum: Processes and productions skills

DIGITAL TECHNOLOGIES

Achievement standard

Students create simple digital solutions and use provided design criteria to check if solutions meet user needs.

Content descriptions

Investigating and defining

Define problems with given design criteria and by co-creating user stories | AC9TDI4P01

Generating and designing

Generate, communicate and compare designs | AC9TDI4P03

Follow and describe algorithms involving sequencing, comparison operators (branching) and iteration | AC9TDI4P02

Producing and implementing

Implement simple algorithms as visual programs involving control structures and input | AC9TDI4P04

Evaluating

Discuss how existing and student solutions satisfy the design criteria and user stories | AC9TDI4P05

DESIGN AND TECHNOLOGIES

Achievement standard

Students select design ideas against design criteria. They communicate design ideas using models and drawings including annotations and symbols. Students plan and sequence steps and use technologies and techniques to safely produce designed solutions.

Content descriptions

Investigating and defining

Explore needs or opportunities for designing, and test materials, components, tools, equipment and processes needed to create designed solutions | AC9TDE4P01

Generating and designing

Generate and communicate design ideas and decisions using appropriate attributions, technical terms and graphical representation techniques, including using digital tools | AC9TDE4P02

Producing and implementing

Select and use materials, components, tools, equipment and techniques to safely make designed solutions | AC9TDE4P03

Evaluating

Use given or co-developed design criteria including sustainability to evaluate design ideas and solutions | AC9TDE4P04

DIGITAL TECHNOLOGIES HUB

Design thinking in context: part 2

Years 3–4

Investigating and defining, Generating and designing, Producing and implementing, Evaluating

Applying design thinking to an authentic context
Design, implement and evaluate an alarm system.

Investigating and defining

Co-create a user story to understand the user and their needs. Provide the design criteria which state the requirements a solution must meet to solve a problem effectively. Use these criteria to define the problem or design challenge.

An example of design criteria for the alarm system:

- The alarm must have a clear method for detecting the event.
- The alarm must provide a clear alert when triggered.
- The system should have a way to reset the alarm.
- The system should be easy to operate.

EMPATHISE

The teacher co-creates a user story with the students.

For a temperature-triggered alarm the user story might look like this:

As a: teacher

I want to: have a temperature alarm system in the classroom that alerts me if the temperature becomes too high or too low.

So that I can: ensure a comfortable learning environment for students and address any issues with the classroom climate promptly.

Work though user stories for other examples, such as a home owner who wants an alarm for home safety, to identify their needs, and why it is important.

DEFINE

Use a problem statement template that uses 5Ws (who, what, when, where, why) questions to explore an identified problem. Clearly define the problem.
For example, 'How do I know when the temperature in the classroom needs adjusting so the students are more comfortable when learning?'

PROBLEM STATEMENT: Enter the problem statement here ...

WHO	WHAT	WHEN?	WHERE?	WHY?
Who is the problem affecting?	What is the unmet need?	When is the problem happening?	Where is the problem occuring?	Why is this worth solving?

Generating and designing

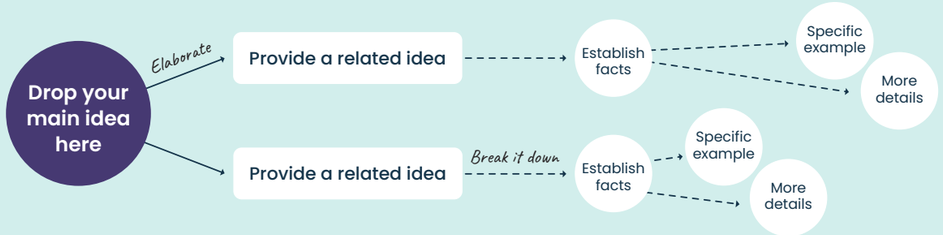
Encourage students to generate multiple designs and compare their designs.

The preferred design should show the idea clearly, highlighting important features and how it works, while also showing who it's for and how it solves a problem.

IDEATE

Students start by exploring all the different ways they could solve this problem. Think about the needs of the user and imagine as many possibilities as they can. At this stage don't judge the design idea.

Use mind maps, for example, to organise and expand on the ideas generated.



PROTOTYPE

Sketches: Sketch out their ideas to highlight how their alarm system works.

Role-playing: Use role-playing to simulate the idea and see how it might work in practice.

Simple models: Create physical or digital models of the proposed design.

TEST

At this level, students compare their design ideas with each other, checking if the user needs are met.

DIGITAL TECHNOLOGIES HUB

Design thinking in context: part 3

Years 3–4

Investigating and defining, Generating and designing, Producing and implementing, Evaluating

Applying design thinking to an authentic context
Design, implement and evaluate alarm system.

Producing and implementing

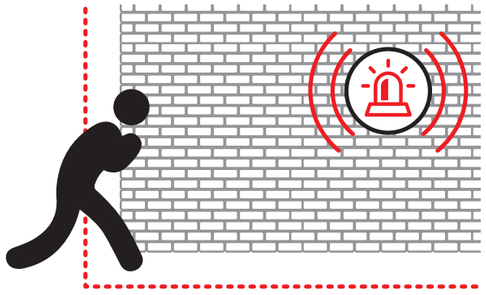
The preferred design idea is implemented and developed into a solution.

In Years 3–4, digital solutions are created as visual programs by coding a set of steps, decisions and repetitions (algorithms). These programs establish sequence, branching and iteration, ensuring logical flow and decision-making.

Examples of implementing a digital solution:

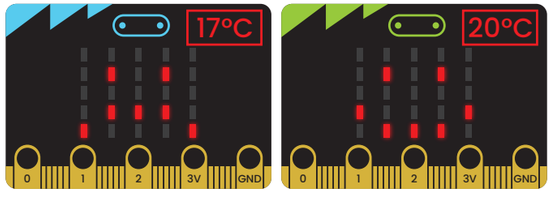
Motion detection alarm

A scratch program that simulates motion detection. When a sprite touches a colour that identifies a restricted zone of the yard, the alarm sounds and alerts the homeowner.



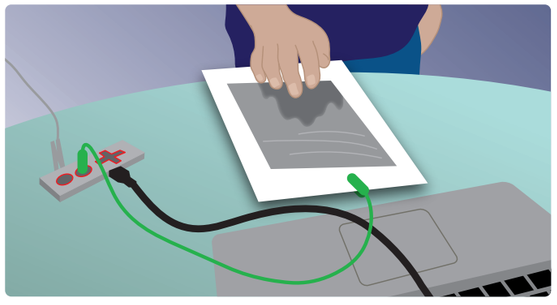
Temperature-triggered alarm

Use a micro:bit to create a program that uses the temperature sensor. If the temperature is less than 18°C then play the tone Middle C for 5 sec and show unhappy face icon. If the temperature is more than 22°C play the tone High F for 5 sec and show unhappy face icon. If not, show happy face icon.



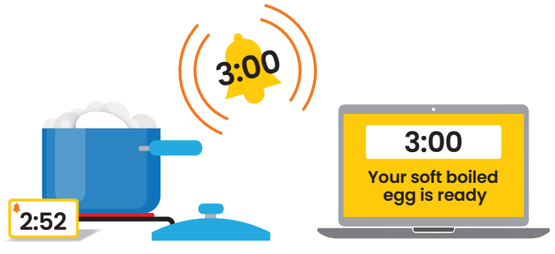
A touch pad

A scratch program that incorporates a Makey Makey connected to an aluminium foil touch pad that when activated sounds an alarm. The alarm sounds until the homeowner hits the stop button.



A timer

A program created in Scratch that provides the home cook with an alarm to ensure they have the perfectly cooked egg. The program uses the sensor blocks for time and reset time. An alert will sound for 10 seconds at different times to indicate a soft, medium or hard-boiled egg.



Evaluating

Once a solution has been implemented, refer to the user story and design criteria to see how well the solution meets the user needs.

Use a checklist that incorporates the design criteria, for example:

- ☑ The alarm has a clear method for detecting the event.
- ☑ The alarm provides a clear alert when triggered.
- ☑ The system has a way to reset the alarm.
- ☑ The system is easy to operate.

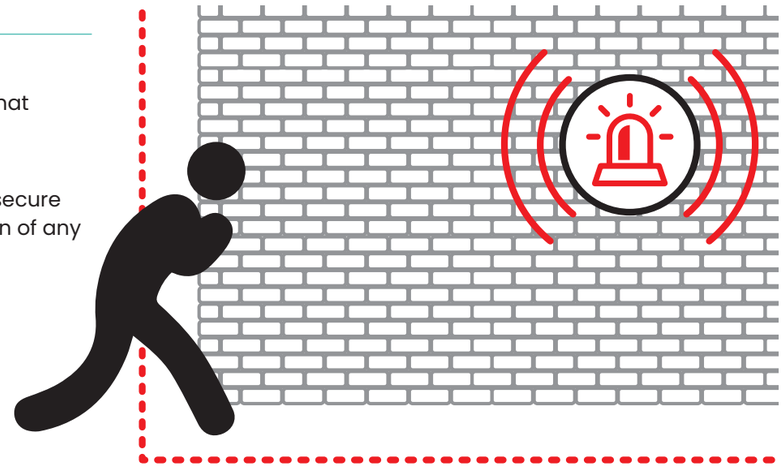
Refer to the user story, how well does it meet the user's needs?

User story: Motion-activated home security alarm

As a: homeowner

I want to: have an alarm system that alerts me when someone enters a restricted area in my home.

So that I can: ensure my home is secure and receive immediate notification of any unauthorised access.



DIGITAL TECHNOLOGIES HUB

Design thinking in context: part 1

Years 5–6

Investigating and defining, Generating and designing, Producing and implementing, Evaluating

This sequence of three posters illustrates how to use an authentic context to design, implement and evaluate a solution. It shows how design thinking can be applied to the processes and productions skills in the Australian Curriculum: Technologies. The context provides an opportunity for students to produce a working model, applying their understanding of materials and engineering, and also implement the solution using visual programming.

CONTEXT: DESIGN, IMPLEMENT AND EVALUATE AN AUTOMATED CAT FEEDER

Design thinking (non-linear)

EMPATHISE
Understand the needs of the user in the context of the design challenge.

DEFINE
Define the challenge based on what you learned about the user.

IDEATE
Combine your understanding of the problem with creativity to generate ideas.

PROTOTYPE
Develop a basic example of your preferred design idea.

TEST
Review your prototype against design criteria and user story.

The Australian Curriculum: Processes and productions skills

DIGITAL TECHNOLOGIES

Achievement standard

Students develop and modify digital solutions and define problems and evaluate solutions using user stories and design criteria. They design algorithms involving complex branching and iteration and implement them as visual programs including variables.

Content descriptions

Investigating and defining
Define problems with given or co-developed design criteria and by creating user stories | AC9TDI6P01

Generating and designing
Design a user interface for a digital system | AC9TDI6P03
generate, modify, communicate and evaluate designs | AC9TDI6P04

Producing and implementing
Implement algorithms as visual programs involving control structures, variables and input | AC9TDI6P05

Evaluating
Evaluate existing and student solutions against the design criteria and user stories and their broader community impact | AC9TDI6P06

DESIGN AND TECHNOLOGIES

Achievement standard

Students select and justify design ideas and solutions against design criteria that include sustainability. They communicate design ideas to an audience using technical terms and graphical representation techniques. Students develop project plans, including production processes, and select technologies and techniques to safely produce designed solutions.

Content descriptions

Investigating and defining
Investigate needs or opportunities for designing, and the materials, components, tools, equipment and processes needed to create designed solutions | AC9TDE6P01

Generating and designing
Generate, iterate and communicate design ideas, decisions and processes using technical terms and graphical representation techniques, including using digital tools | AC9TDE6P02

Producing and implementing
Select and use suitable materials, components, tools, equipment and techniques to safely make designed solutions | AC9TDE6P03

Evaluating
Negotiate design criteria including sustainability to evaluate design ideas, processes and solutions | AC9TDE6P04

DIGITAL TECHNOLOGIES HUB

Design thinking in context: part 2

Years 5–6

Investigating and defining, Generating and designing, Producing and implementing, Evaluating

Applying design thinking to an authentic context
Design, implement and evaluate an automated cat feeder.

Investigating and defining

Students create a user story and define the problem using given or co-created design criteria which state the requirements a solution must meet to solve a problem effectively.

The design criteria for an automated cat feeding system might include the following.

The cat feeder must:

- operate automatically
- provide an amount of food at a set time
- have a backup if something goes wrong.

EMPATHISE

A user story helps to understand the problem and empathise with the user. Discuss the components of a user story such as:

- A <type of user> has <a goal> so that < reason for the goal>.

I want **<a way to feed my cat while I'm away from home>**

so that **<I can ensure my cat is fed on time and the right amount>.**

Role **<cat owner>**

DEFINE

Use the 5Ws (who, what, when, where, why) questions routine to guide students to write the problem statement.

PROBLEM STATEMENT: Enter the problem statement here...

WHO	WHAT	WHEN?	WHERE?	WHY?
Who is the problem affecting?	What is the unmet need?	When is the problem happening?	Where is the problem occuring?	Why is this worth solving?

Problem statement: The cat owner needs a reliable, automated way to ensure their cat is fed the correct amount of food at the right time while they are away.

Generating and designing

Encourage students to generate multiple designs and judge them against design criteria and user stories. Modify and refine the preferred design idea if it does not satisfy all the requirements.

The preferred design should show the idea clearly, highlighting important features and how it works, while also showing who it's for and how it solves a problem.

IDEATE

Brainstorming is a common method of ideation. Start with a core idea and branch out. For example, for the automated cat feeder:

- **Timing:** How often will food be dispensed?
- **Portion size:** How much food will be dispensed?
- **Sensors:** Will it detect if the bowl is empty?
- **Connectivity:** Will it use an app for remote feeding?

Encourage rapid sketching of ideas. Visualise multiple ways to design each key function or component based on the core ideas. Avoid judgment and prioritise creativity. Combine elements from the generated designs to develop a preferred solution.

PROTOTYPE

The prototype of the preferred design idea can be in the form of a sketch, flowchart or simple model.

A **sketch** shows the key parts and how they work together.

A **flowchart** describes the sequence of steps with decisions.

A **simple model** uses readily available materials such as cardboard, plastic containers and masking tape.

TEST

Use the prototype to review and check the preferred design against the user story and design criteria to ensure it meets the design requirements. If elements do not satisfy the design requirements revisit ideation stage.

DIGITAL TECHNOLOGIES HUB

Design thinking in context: part 3

Years 5–6

Investigating and defining, Generating and designing, Producing and implementing, Evaluating

Applying design thinking to an authentic context
Design, implement and evaluate an automated cat feeder.

Producing and implementing

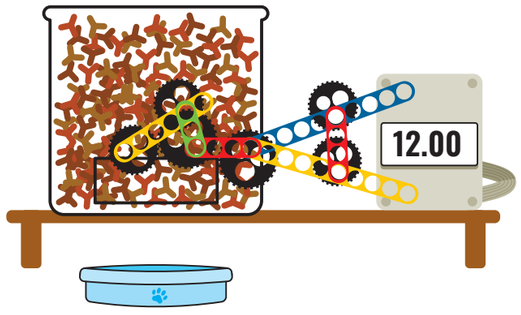
The preferred design idea is implemented and developed into a solution.

In Years 5–6, digital solutions are created as visual programs by coding a set of steps, decisions and repetitions (algorithms). These programs establish sequence, branching and iteration, and include variables ensuring logical flow and decision-making.

Examples of implementing a digital solution:

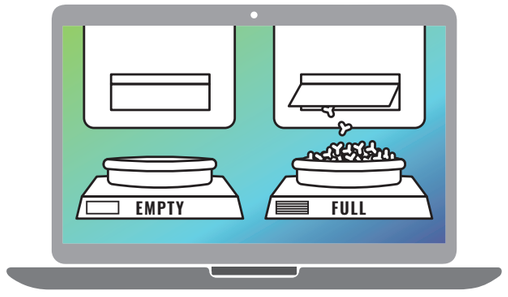
Gravity-fed dispenser

Program the motor to open the flap and release a fixed amount of food after a specified duration using a timing loop.



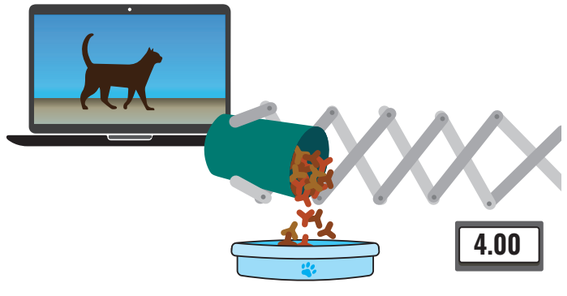
Weight-sensitive dispenser

Simulate the weight sensor input in Scratch and program it to release food when the 'weight' variable meets a certain condition.



Webcam sensor

Train an AI to recognise the cat. A web camera detects the cat and a Scratch program decides to feed the cat depending on how long it has been since the cat has been fed.

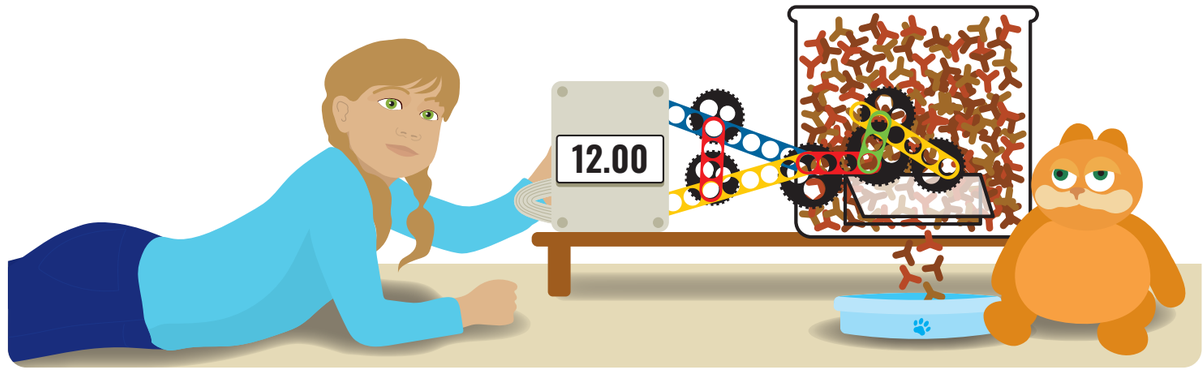


App: smart device

Connect a dispenser to a simple app, allowing the cat owner to dispense food with voice commands. Use Scratch or App Designer to simulate the interface.

Evaluating

Students evaluate the effectiveness of their solution. How well does it address the design criteria and meet the needs identified in the user story? They reflect on the wider community and consider any potential impacts of their solution.



Student reflection

Students present their solutions and explain how they meet the design criteria. Use questions such as these to guide the process:

- How does your solution **automatically feed the cat**?
- How does your solution **measure and dispense the right amount of food and timing**?
- What happens if there's a **technical failure**? What is the backup plan?

Students assign themselves a satisfaction rating, like a 5-star scale, reflecting what they believe the cat owner would give their solution, and provide a justification for their rating.

Personal and community impacts

Students reflect on potential impacts of their solution.

POSITIVE	NEGATIVE
Community impact: Well-fed and contained cats decrease impact on wildlife.	**Sustainability:** The solution requires non-recyclable materials and consumes energy.

DIGITAL TECHNOLOGIES HUB

Design thinking in context: part 1

Years 7–8

Investigating and defining, Generating and designing, Producing and implementing, Evaluating

This sequence of three posters illustrates how to use an authentic context to design, implement and evaluate a solution. It shows how design thinking can be applied to the processes and productions skills in the Australian Curriculum: Technologies. Depending on the context chosen, students may produce a working model, applying their understanding of systems, materials or engineering.

CONTEXT: DESIGN AND CREATE A SMART WEARABLE DEVICE THAT HELPS YOUNG PEOPLE ENHANCE THEIR WELLBEING AND PRODUCTIVITY

Design thinking (non-linear)

EMPATHISE
Understand the needs of the user in the context of the design challenge.

DEFINE
Define the challenge based on what you learned about the user.

IDEATE
Combine creativity and your understanding of the problem to generate ideas for the design challenge.

PROTOTYPE
Develop basic examples of your preferred design idea.

TEST
Review your prototype against design criteria and user story.

The Australian Curriculum: Processes and productions skills

TECHNOLOGIES

Digital Technologies

Achievement standard

Students develop and modify creative digital solutions, decompose real-world problems, and evaluate alternative solutions against user stories and design criteria. They design and trace algorithms and implement them in a general-purpose programming language.

Content descriptions

Investigating and defining

Define and decompose real-world problems with design criteria and by creating user stories | AC9TDI8P04

Generating and designing

Design the user experience of a digital system | AC9TDI8P07

Generate, modify, communicate and evaluate alternative designs | AC9TDI8P08

Producing and implementing

Implement, modify and debug programs involving control structures and functions in a general-purpose programming language | AC9TDI8P09

Evaluating

Evaluate existing and student solutions against the design criteria, user stories and possible future impact | AC9TDI8P10

Design and Technologies

Achievement standard

Students create and adapt design ideas, processes and solutions, and justify their decisions against developed design criteria that include sustainability. They communicate design ideas and solutions to audiences using technical terms and graphical representation techniques, including using digital tools. They independently and collaboratively document and manage production processes to safely produce designed solutions.

Content descriptions

Investigating and defining

Analyse needs or opportunities for designing, and investigate and select materials, components, tools, equipment and processes to create designed solutions | AC9TDE8P01

Generating and designing

Generate, iterate and communicate design ideas, decisions and processes using technical terms and graphical representation techniques, including using digital tools | AC9TDE8P02

Producing and implementing

Select and use suitable materials, components, tools, equipment and techniques to safely make designed solutions | AC9TDE8P03

Evaluating

Develop design criteria collaboratively including sustainability to evaluate design ideas, processes and solutions | AC9TDE8P04

DIGITAL TECHNOLOGIES HUB

Design thinking in context: part 2

Years 7–8

Investigating and defining, Generating and designing, Producing and implementing, Evaluating

Applying design thinking to an authentic context
Design and create a smart wearable device that helps young people enhance their wellbeing and productivity.

Investigating and defining

Students define and decompose real-world problems developing clear design criteria. They create user stories to identify and understand the needs of the user.

When designing a smart wearable to improve well-being and productivity for young people, the design criteria might include key elements such as:

- functionality and interactivity
- aesthetics and user comfort
- inclusivity.

EMPATHISE

A user persona helps to create a fictional character that represents a segment of the target audience. It encourages students to consider various aspects of potential users' lives and needs.

Develop a user story:

- As a <**type of user**>I want to<**a goal**> so that <**reason for the goal or benefit**>.

For example: As a learner who studies for long periods, I want to receive alerts on a wearable, so that I know when I have been stationary for too long, encouraging me to take breaks and stay active.

DEFINE

A clear problem statement is crucial to framing the design challenge. For example, learners often stay stationary for long periods while studying, harming their health and focus. A solution is needed to encourage movement and improve wellbeing and productivity.

Generating and designing

Students generate multiple design ideas creating many and varied possibilities. They evaluate and refine their design ideas by assessing them against these criteria and user stories.

Students collaborate in brainstorming sessions to generate diverse design ideas, fostering creativity and critical thinking. They then evaluate and refine these concepts using established criteria and user stories to ensure their preferred design meets user needs.

IDEATE

Brainstorm a list of functionalities that students might explore when designing a wearable device. These functionalities can be a starting point to consider how their wearable designs can meet user needs effectively.

Use mind mapping to help students visually organise ideas around a central theme, such as health monitoring. This technique allows them to explore various features, user needs and functionalities, promoting creative thinking and generating innovative design ideas.

PROTOTYPE

Sketches: Students sketch out their ideas for their wearable.

Role-playing: Use role-playing to simulate the use of the wearable.

Simple models: Create a physical model of the proposed solution to describe its features and functionality.

TEST

Use the prototype to review and check the preferred design against the user story and design criteria to ensure it meets the design requirements. If elements do not satisfy the design requirements revisit ideation stage.

DIGITAL TECHNOLOGIES HUB

Design thinking in context: part 3

Years 7–8

Investigating and defining, Generating and designing, Producing and implementing, Evaluating

Applying design thinking to an authentic context
Design and create a smart wearable device that helps young people enhance their wellbeing and productivity.

Producing and implementing

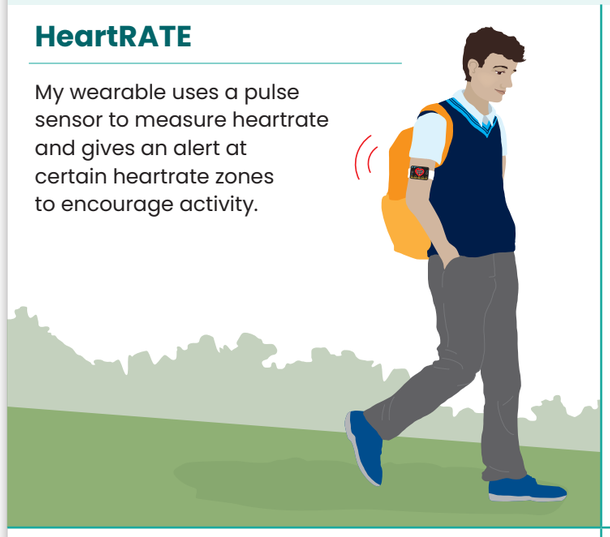
The preferred design idea is implemented and developed into a solution.

Students may use microcontrollers such as micro:bit while those with advanced programming skills may use Arduino-based IDE and wearable tech such as Adafruit.

Examples of implementing a digital solution:

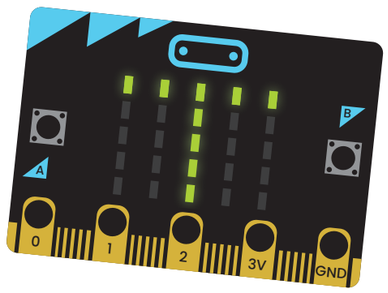
HeartRATE

My wearable uses a pulse sensor to measure heartrate and gives an alert at certain heartrate zones to encourage activity.



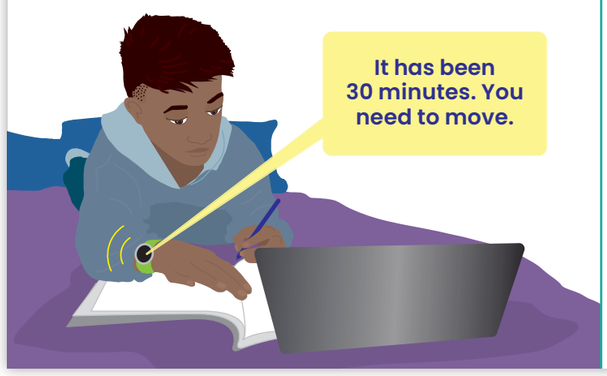
MindfulnessMessenger

My wearable has guided mindfulness quotes that display based on the user's selected emoji, promoting emotional regulation and self-care.



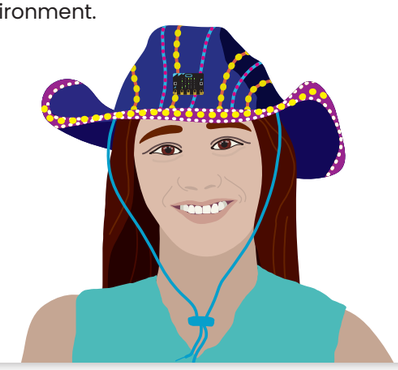
MotionReMinder

My wearable is a reminder to get up and move after periods of inactivity.



MoodGlow

My wearable is made using Adafruit wearable tech. I created a stylish accessory that changes colours or patterns based on the wearer's mood or environment.

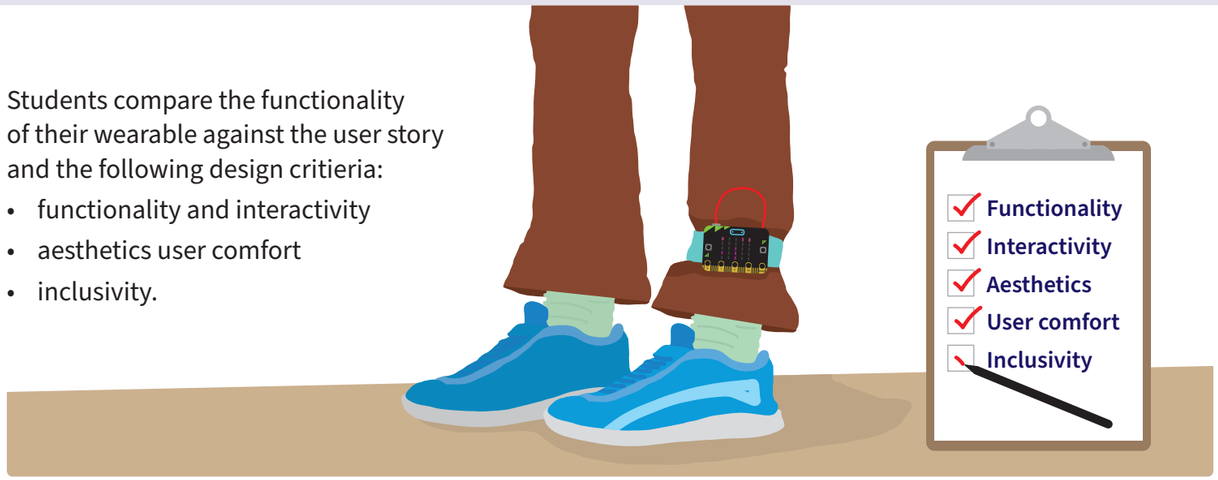


Evaluating

Students evaluate the effectiveness of their solution against the design criteria and user stories. They reflect on the potential future impact of their solution.

Students compare the functionality of their wearable against the user story and the following design critieria:

- functionality and interactivity
- aesthetics user comfort
- inclusivity.



Future impact

Organise a session where students investigate and discuss the potential positive and negative impacts of their wearable on users and the environment.

For example, a student's evaluation of their wearable tech HeartRate:

	Positive impacts	Negative impacts
Physical activity	Enhances activity levels by alerting users to move	May lead to over-reliance on technology for reminders
Health knowledge	Increases awareness of heart rate and fitness levels	Can induce anxiety if users feel pressured by alerts
User motivation	Encourages users to set and achieve personal fitness goals	Users may feel discouraged if they do not meet activity targets
Environmental	Promotes sustainability through health-conscious behaviour	E-waste from discarded devices and batteries can contribute to pollution

DIGITAL TECHNOLOGIES HUB

Design thinking in context: part 1

Years 9–10

Investigating and defining, Generating and designing, Producing and implementing, Evaluating

This sequence of three posters illustrates how to use an authentic context to design, implement and evaluate a solution. It shows how design thinking can be applied to the processes and productions skills in the Australian Curriculum: Technologies, in particular Digital Technologies. This provides an opportunity for students to create an app alternating between typing code and using blocks. Depending on the context chosen, students may produce a working model, applying their understanding of systems, materials or engineering.

CONTEXT : DESIGN AND CREATE AN APP THAT HELPS TEENS NAVIGATE THE CHALLENGES THEY FACE IN THEIR TEENAGE YEARS

Design thinking (non-linear)

EMPATHISE
Understand the needs of the user in the context of the design challenge.

DEFINE
Define the challenge based on what you learned about the user.

IDEATE
Combine creativity and your understanding of the problem to generate ideas for the design challenge.

PROTOTYPE
Develop basic examples of your preferred design idea.

TEST
Review your prototype against design criteria and user story.

The Australian Curriculum: Processes and productions skills

DIGITAL TECHNOLOGIES

Achievement standard

Students develop and modify innovative digital solutions, decompose real-world problems, and critically evaluate alternative solutions against stakeholder elicited user stories.

Content descriptions

Investigating and defining

Define and decompose real-world problems with design criteria and by interviewing stakeholders to create user stories | AC9TDI10P04

Generating and designing

Design and prototype the user experience of a digital system | AC9TDI10P07

Generate, modify, communicate and critically evaluate alternative designs | AC9TDI10P08

Producing and implementing

Implement, modify and debug modular programs, applying selected algorithms and data structures, including in an object-oriented programming language | AC9TDI10P09

Evaluating

Evaluate existing and student solutions against the design criteria, user stories, possible future impact and opportunities for enterprise | AC9TDI10P10

DESIGN AND TECHNOLOGIES

Achievement standard

Students create, adapt and refine design ideas, processes and solutions and justify their decisions against developed design criteria that include sustainability. They communicate design ideas, processes and solutions to a range of audiences, including using digital tools. Students independently and collaboratively develop and apply production and project management plans, adjusting processes when necessary. They select and use technologies skilfully and safely to produce designed solutions.

Content descriptions

Investigating and defining

Analyse needs or opportunities for designing; develop design briefs; and investigate, analyse and select materials, systems, components, tools and equipment to create designed solutions | AC9TDE10P01

Generating and designing

Generate, iterate and communicate design ideas, decisions and processes using technical terms and graphical representation techniques, including using digital tools | AC9TDE10P02

Producing and implementing

Select and use suitable materials, components, tools, equipment and techniques to safely make designed solutions | AC9TDE10P03

Evaluating

Develop design criteria independently including sustainability to evaluate design ideas, processes and solutions | AC9TDE10P04

DIGITAL TECHNOLOGIES HUB

Design thinking in context: part 2

Years 9–10

Investigating and defining, Generating and designing, Producing and implementing, Evaluating

Applying design thinking to an authentic context
Design and create an app that helps teens navigate the challenges they face in their teenage years.

Investigating and defining

Students define and decompose real-world problems and develop design criteria. They interview stakeholders to create user stories.

The design criteria for an app that helps teens navigate this time in their lives might be developed around key elements such as these:

- User-interface
- Engagement and motivation
- Inclusivity
- User safety

EMPATHISE

Use an empathy map to visualise teens' thoughts, feelings, needs and behaviours to inform stakeholder interview questions.

Use stakeholder interviews to check assumptions, gather insights and deepen understanding of the target audience.

Develop a user story:

- As a <**type of user**>I want to<**a goal**> so that <**reason for the goal or benefit**>.

For example: As a teenager, I want to receive daily suggestions, so that I can stay motivated, build healthy habits and earn rewards for my progress.

DEFINE

Define the problem clearly. Create a concise problem statement that addresses the core issue.

'Teenagers struggle with stress and healthy living due to academic pressure, social media, and lack of resources.'

Generating and designing

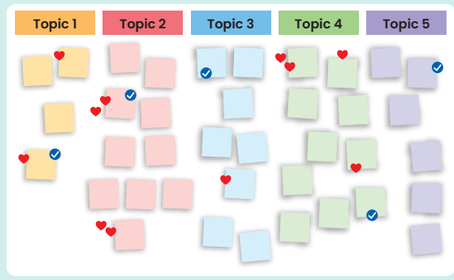
Students generate multiple designs creating many and varied possibilities using a range of ideation techniques, for example, using graphic organisers, role-play or mind mapping.

They critically evaluate to eliminate, refine or modify alternative design ideas by assessing them against these criteria and stories.

IDEATE

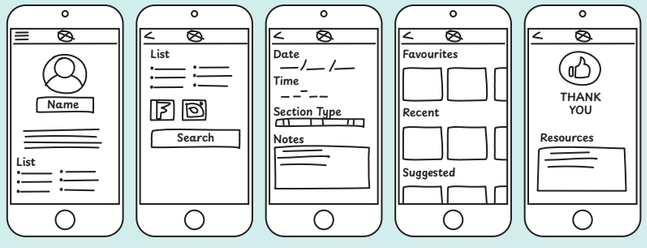
Create an affinity diagram by writing down ideas for app features on sticky notes and grouping similar ideas together. Once grouped, label each category to identify the main themes and prioritise which features to focus on for the app design. Review against design criteria and user stories.

Use SWOT analysis to help students critically evaluate their ideas, providing them with clear insights on the key functions to develop in the app.



PROTOTYPE

Develop design ideas and user flows using paper prototyping.



TEST

Use the prototype to review and check the preferred design against the user story and design criteria to ensure it meets the design requirements. If elements do not satisfy the design requirements revisit ideation stage.

Design thinking in context: part 3

Years 9–10

Investigating and defining, Generating and designing, Producing and implementing, Evaluating

Applying design thinking to an authentic context
Design and create an app that helps teens navigate the challenges they face in their teenage years.

Producing and implementing

The preferred design idea is implemented and developed into a solution.

Platforms such as MIT app inventor enables students to use visual programming blocks. This partially meets the Producing and implementing sub-strand of the Australian Curriculum for Years 9–10. App Lab is a programming environment where students can make simple apps coding in JavaScript, a text-based coding language.

Examples of implementing a digital solution:

Fit-habit

My fitness and health app sets daily challenges for physical activity, water intake, and healthy eating. It rewards users for sticking to healthy routines with streaks and achievements.

MindfulMe

My wellbeing app promotes mental and physical health, with mindfulness exercises and screen time management.

PlanPal

My user-friendly app helps teens plan their day effectively by allowing them to set goals, schedule tasks and manage their time.

GetEcoSmart

Use my app to receive daily challenges, such as reducing water usage, recycling correctly or going plastic-free for a day, to promote sustainable habits.

Evaluating

Students evaluate the effectiveness of their solution against the design criteria and user stories. They reflect on the future impact and opportunities for enterprise of their solution.

Students systematically compare each feature of their app against the original user story and design criteria. For example, they can list the elements of the user story and check off which features address each part.

Reflection and self-assessment

Students reflect on their app design and development process. They write a self-assessment discussing how well they believe their app fulfills the user story and design criteria, highlighting strengths and areas for improvement.

Future impact and opportunities for enterprise

Organise a session where students discuss the potential positive and negative impacts of their app on users and the environment.

Students outline key aspects of their app's enterprise potential.

- Who is the target audience?
- What is unique about the app?
- Potential for the app be monetised?

Positives	Negatives
• Helps students plan their day	• The user has to enter their own data