**Australian Curriculum:
Digital Technologies**

**Years 5–6**

**Sample assessment task**

 **Representing data**

**Assessment focus:** Australian Curriculum:Digital Technologies
(Data and Creating digital solutions)

**About this assessment task**

This sample assessment task has been prepared to assist teachers with the implementation of the Australian Curriculum: Digital Technologies, with a particular focus on *data*. It shows how aspects of the Digital Technologies curriculum related to data can be assessed using contexts from other learning areas and subjects. These contexts may be content that students have recently completed or are learning concurrently. This approach should enhance the manageability of the curriculum while still providing a targeted focus on Digital Technologies.

**Purpose**

The sample task aims to:

* demonstrate meaningful curriculum links to:
* Digital Technologies curriculum:
	+ - achievement standard
		- content descriptions
		- content strands
		- key concepts
		- key ideas (Technologies)
* general capabilities
* cross-curriculum priorities
* other learning areas. See Appendix 1 for detailed links.
* provide teacher support materials, suggested adjustments for students with diverse needs and resources. See Appendix 2.
* provide a template to create your own assessment task. See Appendix 3.

**How to use this sample task**

The sample task can be implemented as a standalone task, or it can be used to inform planning of a:

* unit of work that might accompany the sample task
* similar task and/or unit of work with a focus on data.

**Title: Representing data**

**Assessment focus:** Australian Curriculum: Digital Technologies
(Data and Creating digital solutions). This task is also linked to Mathematics. Depending on modifications made to this task, opportunities may exist to link this task to Science (electricity and circuits), English or Media Arts.

**Band:** Years 5 and 6 (intended cohort Year 6)

**Context:** How do digital systems represent data? (Integrating Digital Technologies and Mathematics)

**Duration:** Dependent on how the task is to be implemented

**Prior learning:** Students will have created digital solutions and be aware of the steps involved.

**Task summary**

Students participate in a series of preliminary activities to build their knowledge and understanding of data representation.

Students will:

* explain their understanding of how computers work and function as a digital system and what data are stored on a computer
* explain that the data stored can be represented using binary
* explain the links between the whole number system and the binary system
* learn how to make simple conversions and look into ways in which they can find more efficient ways in which to convert
* explore how text, images and sound are affected when user input is involved
* create a digital or analog portfolio to explain how digital systems use whole numbers as a basis for representing a variety of data types
* give a video/oral presentation that illustrates their understanding of the following:
* What are examples of digital systems that represent, gather and generate data?
* How are whole numbers used to represent data in digital systems?
* How does the binary system work?
* What are some efficient ways to convert?
* How are computer data represented in binary?

**Task features**

Students will be asked to complete the following:

* slide presentation or document of no more than five slides/pages
* aligned video/audio presentation of no more than two minutes
* use of various desktop or tablet applications to support the presentation **or** use of various paper-based options and oral presentation methods and opportunities.

**Background information**

**Teacher guidance and support**

During a unit of work on representation of data where the key concept or big idea is *how whole numbers are used to represent data in digital systems*, students learn:

* that a computer is a system that involves input, storage, processing and output
* how the binary system is used to represent data (text, images and sound).

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**Links to the Australian Curriculum**

Table 1 shows the related Australian Curriculum links to this task. For a more in-depth exploration of the links to the curriculum, see Appendix 1.

Table 1: Links from the task to the Australian Curriculum

|  |  |
| --- | --- |
| **Digital Technologies** ***Achievement standard***Aspects addressed by this task are highlighted. | By the end of Year 6, students explain the fundamentals of digital system components (hardware, software and networks) and how digital systems are connected to form networks. They explain how digital systems use whole numbers as a basis for representing a variety of data types.Students define problems in terms of data and functional requirements and design solutions by developing algorithms to address the problems. They incorporate decision-making, repetition and user interface design into their designs and implement their digital solutions, including a visual program. They explain how information systems and their solutions meet needs and consider sustainability. Students manage the creation and communication of ideas and information in collaborative digital projects using validated data and agreed protocols. |
| ***Strands*** | Digital Technologies knowledge and understanding * Digital systems
* Representation of data

Digital Technologies processes and production skills * Collecting, managing and analysing data
* Creating designed solutions by
* investigating and defining
* generating and designing
* producing and implementing
* evaluating
* collaborating and managing
 |
| ***Content descriptions*** | * Examine the main components of common digital systems and how they may connect together to form networks to transmit data [(ACTDIK014)](http://www.scootle.edu.au/ec/search?accContentId=ACTDIK014)
* Examine how whole numbers are used to represent all data in digital systems [(ACTDIK015)](http://www.scootle.edu.au/ec/search?accContentId=ACTDIK015)
 |
| ***Key concepts*** | * data representation
* data interpretation
* specification
* algorithms
* implementation
* digital systems
 | ***Key ideas***  | * Thinking in Technologies
* computational thinking
* systems thinking
 |
| ***Cross-curriculum priorities*** | N/A | ***General capabilities*** | * Information and Communication Technology (ICT) Capability
* Literacy
* Numeracy
 |

**Assessment planner**

|  |  |
| --- | --- |
| **Achievement standard**(relevant aspect of the achievement standard to be assessed) | **Student evidence** (what student evidence will be considered to judge if the achievement standard aspect has been met) |
| **Digital Technologies** |  |
| Students explain the fundamentals of digital system components (hardware, software and networks) and how digital systems are connected to form networks. | * Students create a spoken, written (including labelled diagrams) or digital presentation to explain the components of digital systems (hardware, software and networks).
 |
| They explain how digital systems use whole numbers as a basis for representing a variety of data types. | * Students create a spoken, written or digital presentation to explain how binary is used in digital systems to represent data.
 |

**Assessment rubric**

This rubric shows only Digital Technologies. **Note:** There are opportunities to include Science, Literacy and Numeracy in the assessment.

|  |  |  |  |
| --- | --- | --- | --- |
| **Digital Technologies**  | **Above standard*****Students*:** | **At standard*****Students*:** | **Below standard*****Students*:** |
| **Digital systems** | explain comprehensively the components of a digital system: hardware and software components (internal and external) that are used to transform data into a digital solution | explain the components of a digital system: hardware and software components (internal and external) that are used to transform data into a digital solution | state some facts about the hardware and software components (internal and or external) of a digital system |
| **Representation of data** | explain comprehensively how digital systems use whole numbers as a basis for representing a variety of data types | explain how digital systems use whole numbers as a basis for representing a variety of data types | state some facts about digital systems, whole numbers, binary and/or data representation |

**Appendix 1**

 **Australian Curriculum links (in detail)**

**Digital Technologies**

**Achievement standard**

By the end of Year 6, students explain the fundamentals of digital system components (hardware, software and networks) and how digital systems are connected to form networks. They explain how digital systems use whole numbers as a basis for representing a variety of data types.

Students define problems in terms of data and functional requirements and design solutions by developing algorithms to address the problems. They incorporate decision-making, repetition and user interface design into their designs and implement their digital solutions, including a visual program. They explain how information systems and their solutions meet needs and consider sustainability. Students manage the creation and communication of ideas and information in collaborative digital projects using validated data and agreed protocols.

 **Content descriptions**

|  |
| --- |
| Examine the main components of common digital systems and how they may connect together to form networks to transmit data [(ACTDIK014)](http://www.scootle.edu.au/ec/search?accContentId=ACTDIK014)Examine how whole numbers are used to represent all data in digital systems ([ACTDIK015](http://www.scootle.edu.au/ec/search?accContentId=ACTDIK015)) |

## **Content strands**

|  |  |
| --- | --- |
| **Digital Technologies knowledge and understanding** | **Digital Technologies processes and production skills** |
| * Representation of data
* Digital systems
 | XX | Collecting, managing and analysing dataCreating digital solutions by:* investigating and defining
* generating and designing
* producing and implementing
* evaluating
* collaborating and managing
 | X |

## **Links to the key ideas**

|  |  |  |
| --- | --- | --- |
| **Creating preferred futures** | Students develop solutions to meet needs considering impacts on liveability, economic prosperity and environmental sustainability. |  |
| **Project management** | Students will develop skills to manage projects to successful completion through planning, organising and monitoring timelines, activities and the use of resources. |   |
| **Thinking in Technologies*** Systems thinking
 | Systems thinking is a holistic approach to the identification and solving of problems where the focal points are treated as components of a system, and their interactions and interrelationships are analysed individually to see how they influence the functioning of the entire system.Students will be able to explain how digital systems use whole numbers as a basis for representing a variety of data types.* What are examples of digital systems that represent, gather and generate data?
* How are whole numbers used to represent data in digital systems?
* How does the binary system work?
 | X |
| * Design thinking
 | Design thinking involves the use of strategies for understanding design needs and opportunities, visualising and generating creative and innovative ideas, planning, and analysing and evaluating those ideas that best meet the criteria for success. |  |
| * Computational thinking
 | Computational thinking is a problem-solving method that is applied to create solutions that can be implemented using digital technologies. It involves integrating strategies, such as organising data logically, breaking down problems into parts, interpreting patterns and models, and designing and implementing algorithms.Decimal number system (base 10) vs binary number system (base 2)* Students comparing the two number systems and how number values are represented in each.

Converting between the two formats* Using multiplication by 2 or division by 2, students convert between one format and the other
* What are some efficient ways to convert?
 | X |

Read more about the [key ideas in the Australian Curriculum: Technologies](https://www.australiancurriculum.edu.au/f-10-curriculum/technologies/key-ideas/).

**Links to the key concepts**

The [key concepts](https://www.australiancurriculum.edu.au/f-10-curriculum/technologies/digital-technologies/structure/)that underpin the Digital Technologies curriculum establish a way of thinking about problems, opportunities and information systems and provide a framework for knowledge and practice. (Colour coding is based on the [Australian Computing Academy scheme](https://aca.edu.au/#what-is-the-digital-technologies-curriculum).)

|  |  |  |
| --- | --- | --- |
|  | **abstraction** | underpins all content, particularly the content descriptions relating to the concepts of data representation; and specification; algorithms; and implementation  |
|  | **data collection**  | (properties, sources and collection of data) |   |
|  | **data representation**  | (symbolism and separation) | X |
|  | **data interpretation** | (patterns and contexts)  | X |
|  | **specification** | (descriptions and techniques) |  |
|  | **algorithms** | (following and describing) |  |
|  | **implementation** | (translating and programming) |  |
|  | **digital systems**  | (hardware, software, and networks and the internet) | X |
|  | **interactions** | (people and digital systems, data and processes) |  |
|  | **impact** | (sustainability and empowerment) |  |

**Cross-curriculum priorities** [Read more…](https://www.australiancurriculum.edu.au/f-10-curriculum/cross-curriculum-priorities/)

|  |  |  |
| --- | --- | --- |
| **Aboriginal and Torres Strait Islander histories and cultures** | **Asia and Australia’s engagement with Asia** | **Sustainability** |
|  |  |   |

## **General capabilities** [Read more…](https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/information-and-communication-technology-ict-capability/)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Literacy** | **Numeracy** | **ICT Capability** | **Critical and Creative Thinking** | **Ethical Understanding** | **Personal and Social Capability** | **Intercultural Understanding** |
| X | X | X |  |  |  |  |

**Links to ICT Capability continuum: Level 4** [Read more*…*](https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/information-and-communication-technology-ict-capability/)

Depending on the year level this activity is being used with, please adjust content to appropriate level.

|  |
| --- |
| **Applying social and ethical protocols and practices when using ICT** |
| identify the legal obligations regarding the ownership and use of digital products and apply some referencing conventions | X |
| independently apply strategies for determining and protecting the security of digital information and assess the risks associated with online environments |  |
| identify the risks to identity, privacy and emotional safety for themselves when using ICT and apply generally accepted social protocols when sharing information in online environments, taking into account different social and cultural contexts |  |
| explain the main uses of ICT at school, home and in the local community, and recognise its potential positive and negative impacts on their lives |  |
| **Investigating with ICT** |
| use a range of ICT to identify and represent patterns in sets of information and to pose questions to guide searching for, or generating, further information | X |
| locate, retrieve or generate information using search engines and simple search functions and classify information in meaningful ways | X |
| assess the suitability of data or information using a range of appropriate given criteria | X |
| **Creating with ICT** |
| use ICT effectively to record ideas, represent thinking and plan solutions | X |
| independently or collaboratively create and modify digital solutions, creative outputs or data representation/ transformation for particular audiences and purposes | X |
| **Communicating with ICT** |
| select and use appropriate ICT tools safely to share and exchange information and to safely collaborate with others |  |
| understand that particular forms of computer mediated communications and tools are suited to synchronous or asynchronous and one-to-one or group communications |  |
| **Managing and operating ICT** |
| select from, and safely operate, a range of devices to undertake specific tasks and use basic troubleshooting procedures to solve routine malfunctions | X |
| identify, compare and classify basic ICT system components | X |
| manage and maintain data on different storage mediums – locally and on networks | X |

**Links to Literacy**

In this Year 6 task in Digital Technologies, students have the opportunity to develop literacy by comprehending texts through listening, reading and viewing; composing texts through speaking, writing and creating; and using text and word knowledge. They practise literacy skills as they navigate, read and review subject-specific texts; listen to instructions and to identify, respond to and interpret information and opinions; compose and edit learning area texts; use language to interact with others; and deliver presentations. As students explain components of digital systems and representation of data, and give presentations, they apply their developing knowledge of the structure and features of learning area texts to comprehend and compose a range of more complex texts for identified purposes; and use subject-specific vocabulary including words that express shades of meaning.

Visit Literacy general capability <https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/literacy/>

Visit National Literacy Learning Progression <https://www.australiancurriculum.edu.au/resources/national-literacy-and-numeracy-learning-progressions/national-literacy-learning-progression/>

**Links to Numeracy**

In this Year 6 task in Digital Technologies, students have the opportunity to develop numeracy by estimating and calculating with whole numbers, and recognising and using patterns and relationships. In exploring how digital systems represent data – the story of binary – students solve problems and check calculations using efficient mental and written strategies; and identify and describe pattern rules and relationships that help to identify trends.

Visit Numeracy general capability <https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/numeracy/>

Visit National Numeracy Learning Progression

<https://www.australiancurriculum.edu.au/resources/national-literacy-and-numeracy-learning-progressions/national-numeracy-learning-progression/>

## **Links to Science learning area**

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| --- |
| **Science** |
| By the end of Year 6, students compare and classify different types of observable changes to materials. They analyse requirements for the transfer of electricity and describe how energy can be transformed from one form to another when generating electricity. They explain how natural events cause rapid change to Earth’s surface. They describe and predict the effect of environmental changes on individual living things. Students explain how scientific knowledge helps us to solve problems and inform decisions and identify historical and cultural contributions.Students follow procedures to develop investigable questions and design investigations into simple cause-and-effect relationships. They identify variables to be changed and measured and describe potential safety risks when planning methods. They collect, organise and interpret their data, identifying where improvements to their methods or research could improve the data. They describe and analyse relationships in data using appropriate representations and construct multimodal texts to communicate ideas, methods and findings.**Physical sciences**Electrical energy can be transferred and transformed in electrical circuits and can be generated from a range of sources [(ACSSU097)](http://www.scootle.edu.au/ec/search?accContentId=ACSSU097)**Communicating**Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts [(ACSIS110)](http://www.scootle.edu.au/ec/search?accContentId=ACSIS110) |

## **Appendix 2**

## **Support materials**

## Things to think about

 *Rich questions and discussion starters*

Students with diverse needs

## **Resources**

## **Support materials**

## **Things to think about**

Consider the difference between 'represent' in Science (and Mathematics) and 'represent' in Digital Technologies.

***Rich questions and discussion starters***

Asking the right type of questions helps establish what students know about data and also what they can interpret from them. Use open-ended and probing questions (usually beginning with how, who, when, where and why) to promote critical thinking.

For example:

* How do computers store data? (factual)
* How do we multiply and divide by two? (factual)
* What is the relationship between decimal and binary? (conceptual)
* Does a bit of data weigh anything? (debatable)
* Can computers truly be intelligent? (debatable)
* What might be a metaphor or analogy for \_\_\_\_\_\_\_\_\_\_\_? (creative thinking)
* How would \_\_\_\_\_\_\_\_\_\_\_\_\_ affect or influence \_\_\_\_\_\_\_\_\_\_\_? (casual reasoning)
* What parts of \_\_\_\_\_\_\_\_ would be similar to/different than \_\_\_\_\_\_\_\_? (comparison and contrast)

See <https://www.lavc.edu/profdev/library/docs/promotethink.aspx>.

## **Students with diverse needs**

Some students may need simplified, scaffolded support materials or opportunities for extension. Adjustments to this task might include exploration of:

* hands-on activities that show how words and numbers can be represented through patterns
* Computer Science (CS) unplugged activities that explore the concept of binary numbers and binary counting as well as ways to represent other types of data without a computer
	+ <https://classic.csunplugged.org/binary-numbers/>
	+ <https://csunplugged.org/en/topics/binary-numbers/>
* binary as a method of converting data from one format to another. Students may benefit from exploring how this is linked to cryptography.

## **Learning area links**

The way we engage with data is different in the context of each learning area. This sample task is linked to Science since there is a relationship to electricity and electrical circuits in the way binary data are transmitted in a computer (digital system). Teachers might decide to modify the context of this task to link instead to a different related learning area, depending on the assessment task context, such as:

* **Mathematics**
In Year 5, Patterns and Algebra, the following content description may apply:

Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction [(ACMNA107)](http://www.scootle.edu.au/ec/search?accContentId=ACMNA107)

* **English**
A focus on writing tasks or presentations in spoken, written or digital form about the way a digital system works to transmit data in binary may be appropriate.
	+ Examples might include labelled diagrams, video presentations or speeches
* **The Arts**
Students may demonstrate learning in the form of a role play about the way a computer (digital system) transmits data in binary.

## **Resources**

* Copy of the assessment task provided to students (including instructions, marking guidelines/rubric, marking criteria)
* Copy of the slide deck/s (student and teacher versions) that support/s the materials students work through as an introduction to the task

## **Additional resources**

The Digital Technologies in focus project resources web page contains a list of support materials. <https://www.australiancurriculum.edu.au/resources/digital-technologies-in-focus/resources/> including the computational thinking poster <https://www.australiancurriculum.edu.au/resources/digital-technologies-in-focus/resources/>

**What makes a computer a computer?**

* This video explains the core elements of a computer <https://youtu.be/xfKn5OjHLqQ>
	+ Input
	+ Storage
	+ Processing
	+ Output

**Binary and data**

* Teachers could use the [visible thinking routine, ‘Think Puzzle Explore](http://www.visiblethinkingpz.org/VisibleThinking_html_files/03_ThinkingRoutines/03d_UnderstandingRoutines/ThinkPuzzleExplore/ThinkPuzzleExplore_Routine.html)’, a routine that sets the stage for deeper inquiry. This would help lay the groundwork for classroom discussion and sharing or a more detailed independent inquiry. <http://www.visiblethinkingpz.org/VisibleThinking_html_files/03_ThinkingRoutines/03d_UnderstandingRoutines/ThinkPuzzleExplore/ThinkPuzzleExplore_Routine.html>
* [This video](https://youtu.be/ewokFOSxabs) explains how data (text, images and sound) are stored using binary. <https://youtu.be/ewokFOSxabs>
* To connect students’ *prior knowledge* of megabytes and gigabytes as representing how powerful computers are and/or how much storage is available with an understanding of binary numbers, introduce and define terms such as ‘bit’ and ‘byte’. Introduce ASCII as a method of representing characters, and equivalent decimal/binary values. <http://dabblingindata.weebly.com/bits-of-binary.html>

<https://www.digitaltechnologieshub.edu.au/teachers/lesson-ideas/introduction-to-binary>

<https://classic.csunplugged.org/binary-numbers/>

<https://code.org/curriculum/course2/14/Teacher>

<https://studio.code.org/s/pixelation/stage/3/puzzle/1>

* Binary and data (images) <http://csfieldguide.org.nz/en/interactives/pixel-viewer/index.html>
* Binary and data (sound) <https://www.bbc.com/bitesize/guides/zpfdwmn/revision/3>

## **Appendix 3**

## **Data task planning template**

This template is a suggested step-by-step approach that teachers might use to consider whether *all* or *any* of these links apply to an assessment task they develop themselves to better reflect the learning needs of their students and the context of their classroom and school.

**Planning template suggested approach**

Below is a broad outline of how to use the assessment task planning template on the following pages. It reflects the work of Wiggins and McTighe (2012) on Understanding by Design which features a backward design approach.

1. Begin with Digital Technologies:
	1. determine the aspects of the achievement standard that will be the focus of the task
	2. highlight the relevant aspects of the standard
	3. identify what knowledge and skills students will need in order to demonstrate the achievement standards (content descriptions)
	4. identify the strands and threads that will need to be addressed.
2. As Digital Technologies is the driving learning area, it is suggested that only the key ideas for this learning area be identified.
3. Indicate the key concepts of Digital Technologies that will be addressed and how.
4. Scan the Australian Curriculum to find meaningful connections between:
	1. learning areas (two learning areas helps keep learning focused; avoid more than three)
	2. general capabilities
	3. cross-curriculum priorities.

For example, connections could be established on the grounds of:

1. common concepts/key ideas, such as data/design/ways of thinking
2. common words, such as ‘create’, ‘communicate’ and ‘control’
3. contexts, from learning areas such as Science, HASS, HPE, The Arts.
4. Indicate what general capabilities and cross-curriculum priorities can be meaningfully addressed in the assessment task.
5. Construct a task that allows for discrimination in performance and includes:
	* title
	* band level
	* duration
	* task summary, including prior learning
	* achievement standards and content descriptions
	* task
	* assessment rubric.

Search for xxxx and replace with your own text.

**Title: Representing data**

**Assessment focus:** Australian Curriculum: Digital Technologies
(Data and Creating digital solutions). This task is also linked to xxxx. Depending on modifications made to this task, opportunities may exist to link this task to xxxx.

**Band:** Years 5 and 6 (intended cohort Year 6)

**Context:** xxxx

**Duration:** Dependent on how the task is to be implemented

**Prior learning:** Students will have created digital solutions and be aware of the steps involved.

## **Task summary**

Students participate in a series of preliminary activities to build their knowledge and understanding of data representation.

Students will:

* explain their understanding of how computers work and function as a digital system and what data are stored on a computer
* explain that the data stored can be represented using binary
* explain the links between the whole number system and the binary system
* learn how to make simple conversions and look into ways in which they can find more efficient ways in which to convert
* explore how text, images and sound are affected when user input is involved
* create xxxx
* present xxxx that illustrates their understanding of the following:
* What are examples of digital systems that represent, gather and generate data?
* How are whole numbers used to represent data in digital systems?
* How does the binary system work?
* What are some efficient ways to convert?
* How are computer data represented in binary?

**Task features**

Students will be asked to complete the following:

* xxxxx

**Digital Technologies**

**Achievement standard**

By the end of Year 6, students explain the fundamentals of digital system components (hardware, software and networks) and how digital systems are connected to form networks. They explain how digital systems use whole numbers as a basis for representing a variety of data types.

Students define problems in terms of data and functional requirements and design solutions by developing algorithms to address the problems. They incorporate decision-making, repetition and user interface design into their designs and implement their digital solutions, including a visual program. They explain how information systems and their solutions meet needs and consider sustainability. Students manage the creation and communication of ideas and information in collaborative digital projects using validated data and agreed protocols.

## **Content descriptions**

|  |
| --- |
| Examine the main components of common digital systems and how they may connect together to form networks to transmit data ([ACTDIK014](https://www.scootle.edu.au/ec/search?accContentId=ACTDIK014))Examine how whole numbers are used to represent all data in digital systems ([ACTDIK015](http://www.scootle.edu.au/ec/search?accContentId=ACTDIK015)) |

##

## **Content strands** [X any that apply]

|  |  |
| --- | --- |
| **Digital Technologies knowledge and understanding** | **Digital Technologies processes and production skills** |
| Digital systemsRepresentation of data |  | Collecting, managing and analysing dataCreating digital solutions by:* investigating and defining
* generating and designing
* producing and implementing
* evaluating
* collaborating and managing
 |   |

**Links to the key ideas** [X any that apply]

Read more about the [key ideas in the Australian Curriculum: Technologies](https://www.australiancurriculum.edu.au/f-10-curriculum/technologies/key-ideas/).

|  |  |  |
| --- | --- | --- |
| **Creating preferred futures** | Students develop solutions to meet needs considering impacts on liveability, economic prosperity and environmental sustainability. |  |
| **Project management** | Students will develop skills to manage projects to successful completion through planning, organising and monitoring timelines, activities and the use of resources. |   |
| **Thinking in Technologies*** Systems thinking
 | Systems thinking is a holistic approach to the identification and solving of problems where the focal points are treated as components of a system, and their interactions and interrelationships are analysed individually to see how they influence the functioning of the entire system. |  |
| * Design thinking
 | Design thinking involves the use of strategies for understanding design needs and opportunities, visualising and generating creative and innovative ideas, planning, and analysing and evaluating those ideas that best meet the criteria for success. |  |
| * Computational thinking
 | Computational thinking is a problem-solving method that is applied to create solutions that can be implemented using digital technologies. It involves integrating strategies, such as organising data logically, breaking down problems into parts, interpreting patterns and models and designing and implementing algorithms. |  |

**Links to the key concepts** [X any that apply]

The [key concepts](https://www.australiancurriculum.edu.au/f-10-curriculum/technologies/digital-technologies/structure/)that underpin the Digital Technologies curriculum establish a way of thinking about problems, opportunities and information systems and provide a framework for knowledge and practice. (Colour coding is based on the [Australian Computing Academy scheme](https://aca.edu.au/#what-is-the-digital-technologies-curriculum).)

|  |  |  |
| --- | --- | --- |
|  | **abstraction** | underpins all content, particularly the content descriptions relating to the concepts of data representation; and specification; algorithms; and implementation  |
|  | **data collection**  | (properties, sources and collection of data) |  |
|  | **data representation**  | (symbolism and separation) |  |
|  | **data interpretation** | (patterns and contexts)  |  |
|  | **specification** | (descriptions and techniques) |  |
|  | **algorithms** | (following and describing) |  |
|  | **implementation** | (translating and programming) |  |
|  | **digital systems**  | (hardware, software, and networks and the internet) |  |
|  | **interactions** | (people and digital systems, data and processes) |  |
|  | **impact** | (sustainability and empowerment) |  |

## **Cross-curriculum priorities** [X any that apply][Read more…](https://www.australiancurriculum.edu.au/f-10-curriculum/cross-curriculum-priorities/)

|  |  |  |
| --- | --- | --- |
| **Aboriginal and Torres Strait Islander histories and cultures** | **Asia and Australia’s engagement with Asia** | **Sustainability** |
|  |  |   |

## **General capabilities** [X any that apply] [Read more…](https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/information-and-communication-technology-ict-capability/)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Literacy** | **Numeracy** | **ICT Capability** | **Critical and Creative Thinking** | **Ethical Understanding** | **Personal and Social Capability** | **Intercultural Understanding** |
|   |   |   |  |   |   |  |

## **Links to ICT Capability continuum: Level [ ]** [X any that apply][Read more…](https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/information-and-communication-technology-ict-capability/)

Depending on the year level this activity is being used with, please adjust content to appropriate level.

|  |
| --- |
| **Applying social and ethical protocols and practices when using ICT** |
| identify the legal obligations regarding the ownership and use of digital products and apply some referencing conventions |  |
| independently apply strategies for determining and protecting the security of digital information and assess the risks associated with online environments |  |
| identify the risks to identity, privacy and emotional safety for themselves when using ICT and apply generally accepted social protocols when sharing information in online environments, taking into account different social and cultural contexts |  |
| explain the main uses of ICT at school, home and in the local community, and recognise its potential positive and negative impacts on their lives |  |
| **Investigating with ICT** |
| use a range of ICT to identify and represent patterns in sets of information and to pose questions to guide searching for, or generating, further information |  |
| locate, retrieve or generate information using search engines and simple search functions and classify information in meaningful ways |  |
| assess the suitability of data or information using a range of appropriate given criteria |  |
| **Creating with ICT** |
| use ICT effectively to record ideas, represent thinking and plan solutions |  |
| independently or collaboratively create and modify digital solutions, creative outputs or data representation/ transformation for particular audiences and purposes |  |
| **Communicating with ICT** |
| select and use appropriate ICT tools safely to share and exchange information and to safely collaborate with others |  |
| understand that particular forms of computer mediated communications and tools are suited to synchronous or asynchronous and one-to-one or group communications |  |
| **Managing and operating ICT** |
| select from, and safely operate, a range of devices to undertake specific tasks and use basic troubleshooting procedures to solve routine malfunctions |  |
| identify, compare and classify basic ICT system components |  |
| manage and maintain data on different storage mediums – locally and on networks |  |

**Links to Literacy**

Depending on the year level this activity is being used with adjust content to appropriate level.
xxxx

**Links to Numeracy**

Depending on the year level this activity is being used with adjust content to appropriate level xxxx