**Australian Curriculum:**   
**Digital Technologies**

**Sample assessment task**

**Years 5 and 6**

**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 and substrands
    - core concepts (Technologies)
    - core concepts (Digital 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 Science (electricity and circuits). Depending on modifications made to this task, opportunities may exist to link this task to Mathematics, English or Media Arts.

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

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

**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 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 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 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 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 develop and modify digital solutions, and define problems and evaluate solutions using user stories and design criteria. They process data and show how digital systems represent data. Students design algorithms involving complex branching and iteration and implement them as visual programs including variables. They securely access and use multiple digital systems and describe their components and how they interact to process and transmit data. Students select and use appropriate digital tools effectively to plan, create, locate and share content, and to collaborate, applying agreed conventions and behaviours. They identify their digital footprint and recognise its permanence. | | |
| ***Strand***  *Sub-strands* | **Digital Technologies knowledge and understanding**   * Digital systems * Data representation | | |
| ***Content descriptions*** | * investigate the main internal components of common digital systems and their function AC9TDI6K01 * examine how digital systems form networks to transmit data AC9TDI6K02 * explain how digital systems represent all data using numbers AC9TDI6K03 * explore how data can be represented by off and on states (zeros and ones in binary) AC9TDI6K04 | | |
| ***Technologies core concepts*** | * computational thinking * systems thinking * data * systems * interactions and impact | ***Digital Technologies core concepts*** | * data representation * data interpretation\* * specification * algorithms * implementation * digital systems |
| ***Cross-curriculum priorities*** | N/A | ***General capabilities*** | * Digital Literacy * Literacy * Numeracy |

\*Through Mathematics content descriptions

**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** | |
| They securely access and use multiple digital systems and describe their components and how they interact to process and transmit data. | * Students create a spoken, written (including labelled diagrams) or digital presentation to explain the components of digital systems (hardware, software and networks). |
| They process data and show how digital systems represent data. | * 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 digital systems: hardware and software components  (internal and external) that  are used to process and transmit data | securely access and use multiple digital systems and describe their components and how they interact to process and transmit data. | state some facts about the hardware and software components  (internal and or external) of a digital system |
| **Data representation** | explain comprehensively how digital systems use binary numbers as a basis for representing a variety of  data types | process data and show how digital systems represent data. | state some facts about digital systems, numbers, binary and/or data representation |

**Appendix 1**

**Australian Curriculum links (in detail)**

**Digital Technologies**

**Achievement standard**

By the end of Year 6 students develop and modify digital solutions, and define problems and evaluate solutions using user stories and design criteria. They process data and show how digital systems represent data. Students design algorithms involving complex branching and iteration and implement them as visual programs including variables. They securely access and use multiple digital systems and describe their components and how they interact to process and transmit data. Students select and use appropriate digital tools effectively to plan, create, locate and share content, and to collaborate, applying agreed conventions and behaviours. They identify their digital footprint and recognise its permanence.

**Content descriptions**

|  |
| --- |
| investigate the main internal components of common digital systems and their function AC9TDI6K01  examine how digital systems form networks to transmit data AC9TDI6K02  explain how digital systems represent all data using numbers AC9TDI6K03  explore how data can be represented by off and on states (zeros and ones in binary) AC9TDI6K04 |

## **Content strands**

|  |  |  |  |
| --- | --- | --- | --- |
| **Digital Technologies knowledge and understanding** | | **Digital Technologies processes and production skills** | |
| * Data representation * Digital systems | X  X | Acquiring, managing and analysing data\*  Creating digital solutions by:   * investigating and defining * generating and designing * producing and implementing * evaluating * collaborating and managing | X |

\*through Mathematics content descriptions

## **Links to Technologies core concepts (v9)**

|  |  |  |
| --- | --- | --- |
| Creating preferred futures | Creating preferred futures is the overarching core concept. It involves identifying compelling visions of the future and making considered design decisions taking into account diversity; ethics; and economic, environmental and social sustainability factors. This overarching core concept is developed through the Technologies core concepts. | X |
| Systems | Systems comprise the structure, properties, behaviour and interactivity of people and components (inputs, processes and outputs) within and between natural, managed, constructed and digital environments. | X |
| Data | Data can be acquired, interpreted and represented to help inform decision-making and can be manipulated, stored and communicated by digital systems. | X |
| Interactions and impact | Interactions and impact need to be considered when creating solutions; this involves examining the relationships between components of technologies systems, sustainability and the effects of design decisions on users. | X |
| Systems thinking | Systems thinking helps people to think holistically about the interactions and interconnections that shape the behaviour of systems.  Students will be able to explain how digital systems use numbers as a basis for representing a variety of data types.   * What are examples of digital systems that represent and generate data? * How are numbers used to represent data in digital systems? * How does the binary system work? | X |
| Computational thinking | Computational thinking helps people to organise data logically by breaking down problems into parts; defining abstract concepts; and designing and using algorithms, patterns and models.  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 |
| Design thinking | Design thinking helps people to empathise and understand needs, opportunities and problems; generate, iterate and represent innovative, user-centred ideas; and analyse and evaluate those ideas. |  |
| Technologies processes and production skills | Technologies processes and production skills help people to safely create solutions for a range of purposes and involve investigating and defining, generating and designing, producing and implementing, evaluating, and collaborating and managing. |  |
| Project management skills | Project management skills help people to successfully and efficiently plan, manage and complete projects to meet identified design criteria. |  |
| Enterprise skills and innovation | Enterprise skills and innovation helps people to identify opportunities to take action and create change; follow through on initiatives; and generate new ideas, processes and solutions. |  |

**Links to the Digital Technologies core concepts (v9)**

The core conceptsthat underpin the Digital Technologies curriculum establish a way of thinking about problems, opportunities and digital systems and provide a framework for knowledge and practice. (Colour coding is based on the v8.4 [Australian Computing Academy scheme](https://aca.edu.au/#what-is-the-digital-technologies-curriculum).)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **digital systems** | processing data in binary, made up of hardware, controlled by software, and connected to form networks   * *Investigate the ways in which digital systems connect and transmit data using numbers including binary* | X |
|  | **data representation** | data being represented and structured symbolically for storage, use and communication, by people and in digital systems   * *Investigate communication techniques by converting messages to binary and examining sound and picture data* | X |
|  | **data acquisition\*** | numerical, categorical or structured values acquired or calculated to create information |  |
|  | **data interpretation\*** | extracting meaning from data   * *Decipher binary messages into decimal and English* | X |
|  | **abstraction** | reducing complexity by hiding details so that the main idea, problem or solution can be defined and focus can be on a manageable number of aspects |  |
|  | **specification** | defining a problem precisely and clearly, identifying the requirements, and breaking the problem into manageable pieces |  |
|  | **algorithms** | the precise sequences of steps and decisions needed to solve a problem, often involving iterative (repeated) processes |  |
|  | **implementation** | the automation of an algorithm, typically by writing a computer program or using appropriate software |  |
|  | **privacy and security** | the protection of data when it is stored or transmitted through digital systems |  |

\*Through Mathematics content

## **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** |
|  |  | X |

## **General capabilities (v9)** [Read more…](https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Literacy** | **Numeracy** | **Digital Literacy** | **Critical and Creative Thinking** | **Ethical Understanding** | **Personal and Social capability** | **Intercultural Understanding** |
| X | X | X | X |  | X |  |

**Links to Digital Literacy continuum (v9): Level 4**

Depending on the year level this activity is being used with, adjust content to the appropriate level;  
for example, Level 2, 3, 5.

|  |  |
| --- | --- |
| **Practising digital safety and wellbeing** | |
| Manage online safety   * report negative or harmful online behaviour to trusted adults and know how to report it in online tools and recognise when to step away from negative online social interactions |  |
| Manage digital privacy and identity   * recognise the permanence of their digital footprint and digital identity and the associated risks including to their reputation * give and seek consent before sharing online in trusted groups |  |
| Manage digital wellbeing   * follow an agreed code of conduct for the healthy and productive use of digital tools, considering the impact of tool use on wellbeing |  |
| **Investigating** | |
| Locate information   * locate information through search engines and in documents by applying specific search terms based on set criteria, and select and retrieve relevant information from multiple sources | X |
| Acquire and collate data   * collect and access data using a range of digital tools and methods in response to a defined question or problem | X |
| Interpret data   * analyse and visualise data using a range of digital tools to identify patterns and make predictions | X |
| **Creating and exchanging** | |
| Plan   * select and use digital tools to develop and follow a plan to complete individual tasks and group projects |  |
| Create, communicate and collaborate   * select and control a variety of features in appropriate digital tools to create content and communicate and collaborate with trusted groups | X |
| Respect intellectual property   * respect intellectual property by identifying the legal obligations regarding the ownership and appropriate use of products, exploring copyright protocols and applying some referencing conventions | X |
| **Managing and operating** | |
| Manage content   * store content using appropriate names and folders for ease of retrieval | X |
| Protect content   * protect content when sharing with peers and trusted adults by setting appropriate access controls | X |
| Select and operate tools   * select and use the core features of digital tools to efficiently complete tasks * troubleshoot basic problems and identify repetitive tasks to automate | 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/](https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/literacy/" \t "_blank)

## **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/>

## **Links to Science learning area**

|  |
| --- |
| **Science** |
| By the end of Year 6 students explain how changes in physical conditions affect living things. They model the relationship between the sun and planets of the solar system and explain how the relative positions of Earth and the sun relate to observed phenomena on Earth. They identify the role of circuit components in the transfer and transformation of electrical energy. They classify and compare reversible and irreversible changes to substances. They explain why science is often collaborative and describe different individuals’ contributions to scientific knowledge. They describe how individuals and communities use scientific knowledge.  Students plan safe, repeatable investigations to identify patterns and test relationships and make reasoned predictions. They describe risks associated with investigations and key intercultural considerations when planning field work. They identify variables to be changed, measured and controlled. They use equipment to generate and record data with appropriate precision. They construct representations to organise and process data and information and describe patterns, trends and relationships. They identify possible sources of error in their own and others’ methods and findings, pose questions for further investigation and select evidence to support reasoned conclusions. They select and use language features effectively for their purpose and audience when communicating their ideas and findings.  **Physical sciences**  investigate the transfer and transformation of energy in electrical circuits, including the role of circuit components, insulators and conductors AC9S6U03  **Communicating**  write and create texts to communicate ideas and findings for specific purposes and audiences, including selection of language features, using digital tools as appropriate AC9S6I06 |

## **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**

Students may need **scaffolded support materials**. Adjustments to this task might include:

* 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
  + [classic.csunplugged.org/activities/binary-numbers/](https://classic.csunplugged.org/activities/binary-numbers/)
  + [csunplugged.org/en/topics/binary-numbers/](https://csunplugged.org/en/topics/binary-numbers/)
* placing students in groups with students who can support them with encouraging questions and ideas during the analysis and design phase
* grouping students with peer-mentors who can support their literacy or numeracy needs (including training students who find the task too easy to be effective peer-mentors)
* having students with literacy support needs answer questions using video or recorded voice rather than writing or typing
* using teacher assistants to support literacy demands of a task to enable student to show evidence of digital technologies learning
* encouraging students to communicate via online secure chat for those who rarely speak up during group work
* checking in at frequent intervals to determine students understanding of the task
* focusing on what students can do rather than what they cannot do when providing feedback.

Use professional judgement to provide rapid support when students are struggling with a task due to the literacy or numeracy demands of the task.

Students might need opportunities for **extension**. Adjustments for such students might include:

* 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 6, Algebra, the following content description may apply:

recognise and use rules that generate visually growing patterns and number patterns involving rational numbers AC9M6A01

* **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 multimodal presentation 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. [www.australiancurriculum.edu.au/resources/digital-technologies-in-focus/resources/](https://www.australiancurriculum.edu.au/resources/digital-technologies-in-focus/resources/) including the computational thinking and systems thinking posters [www.australiancurriculum.edu.au/resources/digital-technologies-in-focus/resources/key-ideas-and-concepts/](https://www.australiancurriculum.edu.au/resources/digital-technologies-in-focus/resources/key-ideas-and-concepts/)

**What makes a computer a computer?**

* This video explains the core elements of a computer [youtu.be/xfKn5OjHLqQ](https://youtu.be/xfKn5OjHLqQ)
  + Input
  + Storage
  + Processing
  + Output

**Binary and data**

* [This video](https://youtu.be/ewokFOSxabs) explains how data (text, images and sound) are stored using binary. [youtu.be/ewokFOSxabs](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. [dabblingindata.weebly.com/bits-of-binary.html](http://dabblingindata.weebly.com/bits-of-binary.html)

[www.digitaltechnologieshub.edu.au/teachers/lesson-ideas/introduction-to-binary](https://www.digitaltechnologieshub.edu.au/teachers/lesson-ideas/introduction-to-binary)

[classic.csunplugged.org/activities/binary-numbers/](https://classic.csunplugged.org/activities/binary-numbers/)

[code.org/curriculum/course2/14/Teacher](https://code.org/curriculum/course2/14/Teacher)

[studio.code.org/s/pixelation/stage/3/puzzle/1](https://studio.code.org/s/pixelation/stage/3/puzzle/1)

* Binary and data (images) [www.csfieldguide.org.nz/en/interactives/pixel-viewer/](http://www.csfieldguide.org.nz/en/interactives/pixel-viewer/)
* Binary and data (sound) [www.bbc.com/bitesize/guides/zpfdwmn/revision/3](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 sub-strands that will need to be addressed.
2. As Digital Technologies is the driving learning area, it is suggested that only the core concepts for this learning area be identified.
3. Indicate the core 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, 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 x)

**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 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 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:

* xxxx

Digital Technologies v9

Achievement standard

By the end of Year 6 students develop and modify digital solutions, and define problems and evaluate solutions using user stories and design criteria. They process data and show how digital systems represent data. Students design algorithms involving complex branching and iteration and implement them as visual programs including variables. They securely access and use multiple digital systems and describe their components and how they interact to process and transmit data. Students select and use appropriate digital tools effectively to plan, create, locate and share content, and to collaborate, applying agreed conventions and behaviours. They identify their digital footprint and recognise its permanence.

Content descriptions

|  |
| --- |
| investigate the main internal components of common digital systems and their function AC9TDI6K01  examine how digital systems form networks to transmit data AC9TDI6K02  explain how digital systems represent all data using numbers AC9TDI6K03  explore how data can be represented by off and on states (zeros and ones in binary) AC9TDI6K04  xxxx |

## **Digital Technologies Content strands and sub-strands (v9)** [X any that apply]

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

## **Links to Technologies core concepts (v9)** [X any that apply]

|  |  |  |
| --- | --- | --- |
| Creating preferred futures | Creating preferred futures is the overarching core concept. It involves identifying compelling visions of the future and making considered design decisions taking into account diversity; ethics; and economic, environmental and social sustainability factors. This overarching core concept is developed through the Technologies core concepts. |  |
| Systems | Systems comprise the structure, properties, behaviour and interactivity of people and components (inputs, processes and outputs) within and between natural, managed, constructed and digital environments. |  |
| Data | Data can be acquired, interpreted and represented to help inform decision-making and can be manipulated, stored and communicated by digital systems. |  |
| Interactions and impact | Interactions and impact need to be considered when creating solutions; this involves examining the relationships between components of technologies systems, sustainability and the effects of design decisions on users. |  |
| Systems thinking | Systems thinking helps people to think holistically about the interactions and interconnections that shape the behaviour of systems. |  |
| Computational thinking | Computational thinking helps people to organise data logically by breaking down problems into parts; defining abstract concepts; and designing and using algorithms, patterns and models. |  |
| Design thinking | Design thinking helps people to empathise and understand needs, opportunities and problems; generate, iterate and represent innovative, user-centred ideas; and analyse and evaluate those ideas. |  |
| Technologies processes and production skills | Technologies processes and production skills help people to safely create solutions for a range of purposes and involve investigating and defining, generating and designing, producing and implementing, evaluating, and collaborating and managing. |  |
| Project management skills | Project management skills help people to successfully and efficiently plan, manage and complete projects to meet identified design criteria. |  |
| Enterprise skills and innovation | Enterprise skills and innovation helps people to identify opportunities to take action and create change; follow through on initiatives; and generate new ideas, processes and solutions. |  |

**Links to the Digital Technologies core concepts (v9)** [X any that apply and specify details]

The core conceptsthat underpin the Digital Technologies curriculum establish a way of thinking about problems, opportunities and digital systems and provide a framework for knowledge and practice. (Colour coding is based on the v8.4 [Australian Computing Academy scheme](https://aca.edu.au/#what-is-the-digital-technologies-curriculum).)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **digital systems** | processing data in binary, made up of hardware, controlled by software, and connected to form networks |  |
|  | **data representation** | data being represented and structured symbolically for storage, use and communication, by people and in digital systems |  |
|  | **data acquisition\*** | numerical, categorical or structured values acquired or calculated to create information |  |
|  | **data interpretation\*** | extracting meaning from data |  |
|  | **abstraction** | reducing complexity by hiding details so that the main idea, problem or solution can be defined and focus can be on a manageable number of aspects |  |
|  | **specification** | defining a problem precisely and clearly, identifying the requirements, and breaking the problem into manageable pieces |  |
|  | **algorithms** | the precise sequences of steps and decisions needed to solve a problem, often involving iterative (repeated) processes |  |
|  | **implementation** | the automation of an algorithm, typically by writing a computer program or using appropriate software |  |
|  | **privacy and security** | the protection of data when it is stored or transmitted through digital systems |  |

\*Through Mathematics content

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

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

## **General capabilities (v9)** [Read more…](https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/) [X any that apply]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Literacy** | **Numeracy** | **Digital Literacy** | **Critical and Creative Thinking** | **Ethical Understanding** | **Personal and Social capability** | **Intercultural Understanding** |
|  |  |  |  |  |  |  |

**Links to Digital Literacy continuum (v9): Level 4** [X any that apply and adjust text as necessary]

Depending on the year level this activity is being used with, adjust content to the appropriate level;  
for example, Level 2, 3, 5.

|  |  |
| --- | --- |
| **Practising digital safety and wellbeing** | |
| Manage online safety   * report negative or harmful online behaviour to trusted adults and know how to report it in online tools and recognise when to step away from negative online social interactions |  |
| Manage digital privacy and identity   * recognise the permanence of their digital footprint and digital identity and the associated risks including to their reputation * give and seek consent before sharing online in trusted groups |  |
| Manage digital wellbeing   * follow an agreed code of conduct for the healthy and productive use of digital tools, considering the impact of tool use on wellbeing |  |
| **Investigating** | |
| Locate information   * locate information through search engines and in documents by applying specific search terms based on set criteria, and select and retrieve relevant information from multiple sources |  |
| Acquire and collate data   * collect and access data using a range of digital tools and methods in response to a defined question or problem |  |
| Interpret data   * analyse and visualise data using a range of digital tools to identify patterns and make predictions |  |
| **Creating and exchanging** | |
| Plan   * select and use digital tools to develop and follow a plan to complete individual tasks and group projects |  |
| Create, communicate and collaborate   * select and control a variety of features in appropriate digital tools to create content and communicate and collaborate with trusted groups |  |
| Respect intellectual property   * respect intellectual property by identifying the legal obligations regarding the ownership and appropriate use of products, exploring copyright protocols and applying some referencing conventions |  |
| **Managing and operating** | |
| Manage content   * store content using appropriate names and folders for ease of retrieval |  |
| Protect content   * protect content when sharing with peers and trusted adults by setting appropriate access controls |  |
| Select and operate tools   * select and use the core features of digital tools to efficiently complete tasks * troubleshoot basic problems and identify repetitive tasks to automate |  |

Links to Literacy and Numeracy

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

Links to Literacy

xxxx

Visit Literacy general capability [https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/literacy/](https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/literacy/" \t "_blank)

Links to Numeracy

xxxx

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

Links to learning areas

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