**Australian Curriculum:  
Digital Technologies**

**F–2**

**Sample assessment task**

**Cooling the school**

**Assessment focus:** Australian Curriculum:Digital Technologies   
(digital systems)

**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 focus on *digital systems.* It shows how aspects of the Digital Technologies curriculum related to *digital systems* 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 specific links for this task.
* 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 *digital systems.*

**Title: Cooling the school**

**Assessment focus**: Australian Curriculum: Digital Technologies (Digital systems – recognise and explore digital systems for a purpose). This task is also linked to HASS (Geography focus). Depending on modifications made, opportunities may exist to link this task to Mathematics and/or English.

**Band:** F–2 (intended cohort: Foundation Year)

**Context:** Geography (Humanities and Social Sciences)

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

**Prior learning:** Students will have:

* used and created a variety of simple maps that represent familiar places
* utilised a variety of geographical tools including maps, atlas, globe, digital maps 2D or 3D or both (apps or browser)
* learned that maps are a representation of a place and can be displayed in a variety of ways including standard or satellite
* identified that maps can detail a variety of surfaces including natural and built
* practised how to identify familiar features on standard and satellite maps
* used directional language to assist using printed and digital maps including: closer, further away, zoom in, zoom out, bird’s-eye view, aerial view
* learnt that shaded areas can keep areas cooler
* learnt that trees and plants are different in the amount of shade they can provide
* learned that digital maps are accessible using a variety of digital systems (tablet, smart phone, computer) that they would have at home and school
* explored a variety of familiar digital systems they interact with at home and school
* explored digital maps such as Google Maps or Scribble Maps using a digital system.

**Task summary**

**The key inquiry question will be:**

* How can we cool the school using the natural environment?

**The focus questions will be:**

* How can we find out how much shade there is at a location or at school?
* Can we provide more shade?

**Overview**

Discuss with students how the amount of shade in the school grounds can help keep the area cooler. This can also reduce the need for air-conditioning and make playing in the playground more comfortable. Students will access and annotate a map using a satellite image of the school ground or the early learning area and calculate the areas of natural shade compared with the remaining areas. The choice of image used can be downloaded by the teacher based on their school or use the school map template (Appendix 4). Teachers could even have a buddy class at the school collect the image by using a drone (if available). Students will be able to redesign the satellite image with an increase to tree cover that improves shaded areas while not impacting school use. For example, you wouldn’t cover the school oval in trees as it would make sport difficult but perhaps trees planted around jump pits and oval sidelines would be practical. Students will be able to explain how using simple digital systems can allow us to see changes to the shade cover area at schools.

**Students will:**

* identify how common digital systems (hardware and software) are used to meet a   
  specific purpose
* use a variety of digital systems to collect, explore and sort data, and present   
  data creatively
* explore how common information systems can be used safely for information   
  and communication
* use a range of geographic information systems (GIS) – Google Earth,   
  OpenStreetMap, etc
* create and organise ideas using information systems and share this information with known people in a safe online environment.
* consider how to increase the shaded area of a range of locations familiar to them
* make recommendations as a class on how to increase the shade spaces in the school.

**Task features**

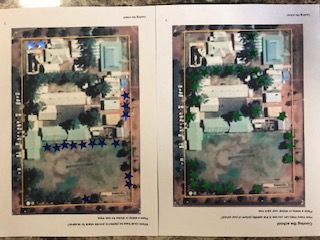
Students will be asked to complete the following formative and summative activities (this can be completed as a class, small groups, independently or a variety of these):

* Identify the different areas of the school grounds using a satellite image (buildings, hard surfaces, grassed areas, trees and shade structures).
* Count how many trees are on the school grounds using the map.
* Colour or stamp tree-shaded areas of a map – paper or digital version.
* Plan on how increased area could be shaded – create improved map.
* Compare the maps of other students.
* Identify ways a digital system could monitor improvements or changes.
* Present the map and improvement ideas to an audience (optional).

**Background information**

**Teacher guidance and support**

* Take students on a shade walk in the school (or early learning area) and identify natural tree shade, constructed shade and non-shaded areas.
  + Identify low-level shade provided by plants that don’t provide shade for students.
* Guide students to counting trees in a known location by demonstrating on the digital whiteboard using a satellite image and placing an emoji or stamp on each tree, for example a local park.
* Refer to Figure 3, which was created using PowerPoint. Paste satellite image and insert icon to assist counting trees. Refer to the supporting resource, Cool your school (PowerPoint).
  + Identify possible locations for new trees that will offer shade while not impacting on the uses at the park.
* Discuss what type of digital systems could be used to monitor future tree growth.
  + Show students a drone that can take images (physical drone or video).
* Give students opportunities to develop their ICT skills by working with images and annotating them with digital ink or shapes.
  + Use the edit photo function or apps that allow photo editing, pasting and drawing. See Figure 1 and Figure 4.
  + Utilise software that allows students to add icons, for example PowerPoint, Word, Paint.





*Maps – imagery: Google, ©2021 CNES / Airbus, Maxar Technologies*

*Tree images added using PowerPoint icons*

Figure 3: Created with PowerPoint

Figure 2: Stickers on printout

Figure 1: Created with Book Creator app

A screenshot of a phone

Description automatically generated with low confidence

*Maps – imagery: Google, ©2021 CNES / Airbus, Maxar Technologies*

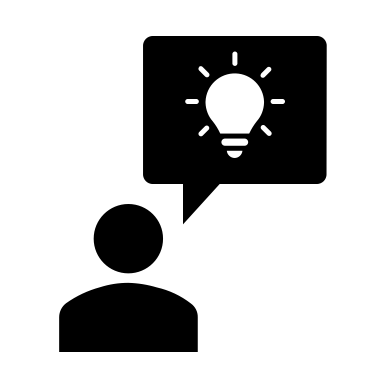
*Tree images added using PowerPoint icons*

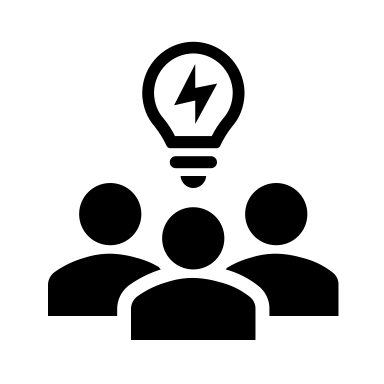
Figure 4: Both images created using markup in iPad Photo app

*Images CC 4.0 ACARA*

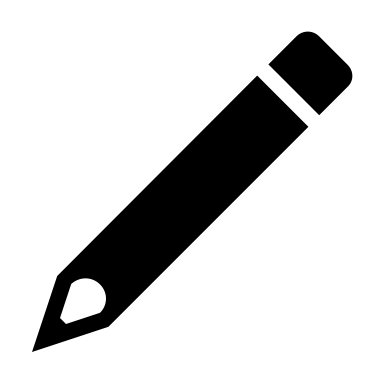
An accompanying PowerPoint slide deck (Digital systems F–2 presentation material) steps through a possible process for this task.

Here’s a guide to the icons you’ll see on the PowerPoint slides:

Presentation materials to teach content to students.

An assessment component which could be added to the assessment portfolio and is intended as formative assessment. Alternatively, you could hold a class discussion to gauge understanding of a topic.

Class discussions on a topic are encouraged as formative assessment.

Work which needs to be completed individually on a device and could be added to a portfolio or digital book as part of the summative task

The PowerPoint slide deck gives an overview with guiding questions following this sequence:

* Digital systems
* Using a digital system: Software and hardware including:
* Google Maps
* Types of maps (satellite, street)
* ScribbleMaps
* Compare the data
* Digital portfolio
* Purposeful audience.

**Links to the Australian Curriculum**

Table 1 shows all 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 2, students identify how common digital systems (hardware and software) are used to meet specific purposes. They use digital systems to represent simple patterns in data in different ways.  Students design solutions to simple problems using a sequence of steps and decisions. They collect familiar data and display them to convey meaning. They create and organise ideas and information using information systems, and share information in safe online environments. | | |
| ***Strands*** | Digital Technologies knowledge and understanding   * Digital systems   Digital Technologies processes and production skills   * Collecting, managing and analysing data * Evaluating * Collaborating and managing | | |
| ***Content descriptions*** | Recognise and explore digital systems (hardware and software components) for a purpose ([ACTDIK001](http://www.scootle.edu.au/ec/search?accContentId=ACTDIK001))  Collect, explore and sort data, and use digital systems to present the data creatively [(ACTDIP003](http://www.scootle.edu.au/ec/search?accContentId=ACTDIP003))  Explore how people safely use common information systems to meet information, communication and recreation needs ([ACTDIP005](http://www.scootle.edu.au/ec/search?accContentId=ACTDIP005))  Create and organise ideas and information using information systems independently and with others, and share these with known people in safe online environments [(ACTDIP006](http://www.scootle.edu.au/ec/search?accContentId=ACTDIP006)) | | |
| ***Key concepts*** | Digital systems  Data collection  Data interpretation  Impact  Interactions | ***Key ideas*** | Systems thinking  Computational thinking |
| ***Cross-curriculum priorities*** | Sustainability | ***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 identify how common digital systems (hardware and software) are used to meet specific purposes | * Students identify ways that digital maps can assist with viewing areas from above for a purpose |
| They collect familiar data and display them to create meaning. | * Students locate existing trees through observation on a satellite map and mark them on the map |
| They create and organise ideas and information using information systems. | * Students mark the location of trees that could increase shaded areas, using digital maps and drawing tools * Students use features that clearly show the difference between existing trees and potential tree plantings |
| Optional:  Share information in safe online environments | * Students share with families, school administration or local government their findings and plan using a digital system |

## **Assessment rubric**

The rubric below shows only Digital Technologies. **Note:** There are opportunities to include Geography, Mathematics, Literacy and Numeracy in the assessment.

|  |  |  |  |
| --- | --- | --- | --- |
| **Digital Technologies** | **Above standard**  ***Students*:** | **At standard**  ***Students*:** | **Below standard**  ***Students*:** |
| Students identify how common digital systems (hardware and software) are used to meet specific purposes. | | | |
| **Digital systems** | identify a range of digital systems (hardware and software including digital maps) and understand their purpose | identify ways common digital systems (hardware and digital maps) can assist with viewing areas from above for a purpose | label some familiar digital systems (hardware or software) |
| independently use digital mapping software for a purpose | play with and use digital mapping software for a purpose with guidance | play with digital mapping software with guidance |
| They collect familiar data and display them to create meaning. | | | |
| **Data collection** | use digital systems independently to gather data by observing and counting plants in their school environment and independently marking them on digital maps | gather data by observing and counting plants in their school environment and marking them on digital maps | with guidance, locate plants in their school environment |
| **Data interpretation** | answer simple questions by classifying, grouping and sorting data (e.g. which plants in the school are better for shade – shrubs or trees?) | explore data by classifying, grouping and sorting (e.g. sort shrubs and trees) | with guidance, sort some data such as circling trees on a digital map |
| They create and organise ideas and information using information systems, *and share information in safe online environments.* | | | |
| **Impact** | describe how familiar information systems such as GPS are used by people in their community to perform typical tasks (e.g. firefighters use GPS to locate addresses they need to attend) | describe how familiar information systems such as in-car GPS support needs at home and school | with guidance, list familiar information systems |
| *Optional:* | independently use familiar information systems to share information with others (e.g. share online map of school with family and how it has been marked to indicate where more trees should be located) | use familiar information systems to share information with others with guidance (e.g. share online map of school with family and how it has been marked to indicate where more trees should be located) | share information with others (e.g. tell family about online map of school) |

**Appendix 1**

**Australian Curriculum links (in detail)**

**Links to the Australian Curriculum**

**Digital Technologies**

**Achievement standard**

By the end of Year 2, students identify how common digital systems (hardware and software) are used to meet specific purposes. They use digital systems to represent simple patterns in data in different ways.

Students design solutions to simple problems using a sequence of steps and decisions. They collect familiar data and display them to convey meaning. They create and organise ideas and information using information systems, and share information in safe online environments.

**Content descriptions**

|  |
| --- |
| Recognise and explore digital systems (hardware and software components) for a purpose ([ACTDIK001](http://www.scootle.edu.au/ec/search?accContentId=ACTDIK001))  Collect, explore and sort data, and use digital systems to present the data creatively [(ACTDIP003](http://www.scootle.edu.au/ec/search?accContentId=ACTDIP003))  Explore how people safely use common information systems to meet information, communication and recreation needs ([ACTDIP005](http://www.scootle.edu.au/ec/search?accContentId=ACTDIP005))  Create and organise ideas and information using information systems independently and with others, and share these with known people in safe online environments [(ACTDIP006](http://www.scootle.edu.au/ec/search?accContentId=ACTDIP006)) |

## **Content strands**

|  |  |  |  |
| --- | --- | --- | --- |
| **Digital Technologies knowledge and understanding** | | **Digital Technologies processes and production skills** | |
| Digital systems | X | Collecting, managing and analysing data | X |
| Representation of data |  | Creating digital solutions by: |  |
|  | | * investigating and designing |  |
| * generating and designing |  |
| * producing and implementing |  |
| * evaluating | X |
|  | | * 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. | X |
| **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. | 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. | 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)   * *Gather and record data by counting and measuring. For example, count the trees in the school yard or early learning area.* | X |
|  | **data representation** | (symbolism and separation) |  |
|  | **data interpretation** | (patterns and contexts)   * *Organise data by classifying, grouping and sorting. For example, sort plants into grasses, bushes and trees.* | X |
|  | **specification** | (descriptions and techniques) |  |
|  | **algorithms** | (following and describing) |  |
|  | **implementation** | (translating and programming) |  |
|  | **digital systems** | (hardware, software, and networks and the internet)   * *Recognise and name digital systems. For example, camera app, online mapping website.* * *Play with and use digital systems in meaningful ways. For example, use online maps to locate the school.* | X |
|  | **interactions** | (people and digital systems, data and processes)   * *Use digital technologies to manipulate data and present a product. For example, share location of plants in the school or early learning area by placing symbols on a map.* | X |
|  | **impact** | (sustainability and empowerment)   * *Discuss the impact digital systems have had on our ability to solve a range of problems that enrich and enhance our lives. For example, students understand that we use systems like online maps to access information, and how using that information helps us learn about our environment.* | X |

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **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 1**

Depending on the year level this activity is being used with, adjust content to the appropriate level;  
for example, Level 1, 2.

|  |  |
| --- | --- |
| **Applying social and ethical protocols and practices when using ICT** | |
| recognise ownership over their own digital work | X |
| follow class rules about using digital information | X |
| follow class rules when sharing personal information with known audiences and demonstrate an awareness of applying social protocols when using ICT to communicate |  |
| identify how they use ICT in multiple ways on multiple devices | X |
| **Investigating with ICT** | |
| use ICT to identify where information is located | X |
| use icons to locate or generate required information |  |
| explain how located data or information was used | X |
| **Creating with ICT** | |
| use ICT to follow or contribute to a simple plan for a solution |  |
| use ICT as a creative tool to generate simple solutions, modifications or data representations for personal or school purposes | X |
| **Communicating with ICT** | |
| use purposefully selected ICT tools safely to view information shared by trusted adults | X |
| understand that messages are recorded, viewed or sent in computer mediated communications for others to receive |  |
| **Managing and operating ICT** | |
| identify and safely operate ICT systems to complete relevant simple specified tasks and seek help when encountering a problem | X |
| identify common consumer ICT systems with input and output functions |  |
| save and retrieve digital data with support |  |

**Links to Literacy**

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**

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 the Humanities and Social Sciences (HASS) learning area**

|  |
| --- |
| **HASS (Geography focus)** |
| **Foundation Year**   |  |  | | --- | --- | | **Knowledge and Understanding** | | | **Geography** | The representation of the location of places and their features on simple maps and models [(ACHASSK014](http://www.scootle.edu.au/ec/search?accContentId=ACHASSK014)) | | **Inquiry and skills** | | | **Questioning** | Pose questions about past and present objects, people, places and events [(ACHASSI001](http://www.scootle.edu.au/ec/search?accContentId=ACHASSI001)) | | **Researching** | Collect data and information from observations and identify information and data from sources provided [(ACHASSI002](http://www.scootle.edu.au/ec/search?accContentId=ACHASSI002)) | | Sort and record information and data, including location, in tables and on plans and labelled maps [(ACHASSI003](http://www.scootle.edu.au/ec/search?accContentId=ACHASSI003)) | | **Analysing** | Interpret data and information displayed in pictures and texts and on maps [(ACHASSI007](http://www.scootle.edu.au/ec/search?accContentId=ACHASSI007)) | | **Evaluating and reflecting** | Draw simple conclusions based on discussions, observations and information displayed in pictures and texts and on maps [(ACHASSI008](http://www.scootle.edu.au/ec/search?accContentId=ACHASSI008)) | | Reflect on learning to propose how to care for places and sites that are important or significant [(ACHASSI009](http://www.scootle.edu.au/ec/search?accContentId=ACHASSI009)) | | **Communicating** | Present narratives, information and findings in oral, graphic and written forms using simple terms to denote the passing of time and to describe direction and location [(ACHASSI010](http://www.scootle.edu.au/ec/search?accContentId=ACHASSI010)) |   **Geography achievement standard**  By the end of Foundation Year, students describe the features of familiar places and recognise why some places are special to people. They recognise that places can be represented on maps and a globe and why places are important to people.  Students observe the familiar features of places and represent these features and their location on pictorial maps and models. They share and compare observations in a range of texts and use everyday language to describe direction and location. Students reflect on their learning to suggest ways they can care for a familiar place. |

## **Appendix 2**

## **Support materials**

## Things to think about

*Rich questions and discussion starters*

Students with diverse needs

## **Resources**

## **Support materials**

## **Things to think about**

## **Lessons ideas prior to assessment**

1. Going on a ‘digital systems in the home’ hunt. Children take photos with a mobile device (smart phone, tablet, digital camera) or digital systems around the house. (Assets: photographs and video footage). Identify if these ‘digital systems’ can access digital maps.
2. Investigate Google Earth as a class on the interactive whiteboard or shared classroom screen. Locate the school, the local park or even the closest beach or significant landmark. Students can investigate Google Earth themselves on computers or mobile devices.
3. Use a variety of simple maps that represent familiar places. Students could code Bee-Bots to start at a point on a map and proceed to a destination. Students could explain their code using directional language.
4. Use a digital thermometer to calculate the temperature of shaded areas compared with unshaded areas of the school. Collect a number of temperature readings to compare. Students can be guided to think about why the temperature may be higher or lower; for example, a large area of concrete with no shade may be higher in temperature than the nearby grassy area with no shade – why is that?
5. In addition to item 4, students could use arbitrary terms to describe the brightness of shaded areas compared with unshaded areas. Collect data from a range of locations – compare this data with the temperatures collected. Does more shade (less brightness) match lower temperatures? You could use the free app, Arduino Science Journal, which can measure brightness in real time and display it as data. This can help students’ thinking that shaded areas can keep the place cooler. Refer to [Science Buddies: Exploring Light with a Sensor App](https://www.sciencebuddies.org/blog/google-science-journal-app-tutorial-part4-light-sensor) to learn how. <https://www.sciencebuddies.org/blog/google-science-journal-app-tutorial-part4-light-sensor>
6. Invite a local plant expert (nursery owner, city council gardener, First Nations Australian with ‘On Country’ knowledge or even a grandparent who enjoys gardening) to discuss the differences between trees and other plants. This could be a good opportunity to also link in discussions about native vegetation. This will guide students’ knowledge that trees and plants are different in the amount of shade they can provide.

## **Rich questions and discussion starters**

**The key inquiry question will be:**

* How can we cool the school using the natural environment?

**The focus questions will be:**

* How can we find out how much shade there is at a location or at school?
* Can we provide more shade?

**Some discussion starters could be:**

* How do we get shade?
* What are the differences between trees and other plants?
* How could we use a digital map to find out how much shade there is at school?
* Can the digital map then help us increase the amount of shade?

**During the teaching and learning cycle, sample questions could include:**

**Comprehension**:

* Can you tell me one digital system you have seen or used at home or in the classroom?
* What is software? Can you point to it? How do you use it? And so on.
* What is hardware? Can you point to it? How do you use it? And so on.

**Application**:

* How can you use a digital map to find out how much shade is in our school?

**Analysis**:

* Why did we use a satellite map to count trees and calculate shade?
* Why did you decide on planting that many trees?
* Why would we prefer shade from trees?

**Synthesis:**

* How can using a digital map help us cool the school?

**Evaluation:**

* How would you judge the accuracy of the data (trees counted on school grounds) we have collected via a digital map?

**Creative thinking:**

* What could be invented to automatically count trees?
* What can we do to increase the natural shade in our school?

## **Students with diverse needs**

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

* 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
* checking in at frequent intervals to determine student’s understanding of the task
* focusing on what a student can do rather than what they cannot when giving feedback.

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

See also: [Improving literacy in lower primary](https://evidenceforlearning.org.au/guidance-reports/improving-literacy-in-lower-primary-school/)

Students might need opportunities for **extension**.

Adjustments for such students might include:

* Independently use the digital maps to create their own map.
* Create a presentation of the information to inform the school administration, local council or wider community of the benefits of more natural shade.
* Give students mentorship training and have them support other students with encouraging questions and ideas.

Change the approach to delivery of this task if a student is disengaged or is finding activities too easy or too hard.

## **Resources**

* Arduino Science Journal app (formerly known as Google Science Journal) available from: <https://apps.apple.com/us/app/arduino-science-journal/id1518014927> and <https://play.google.com/store/apps/details?id=cc.arduino.sciencejournal>
* PowerPoint (teacher or student use) – Digital Systems F–2 presentation material
* PowerPoint – Cool your school
* Appendix 4 – School map template – Count trees – unplugged activity (Word document)

**Weblinks**

* Australian Geography Teachers Association (AGTA), 2019, *Geographical Education*, AGTA, vol. 32. [www.agta.asn.au/Resources/GeographicalEducation/geoged-v32-2019.php](http://www.agta.asn.au/Resources/GeographicalEducation/geoged-v32-2019.php)
* Caldis, S & Kleeman, G, 2019, ‘Geography and STEM’, *Geographical Education*, AGTA, vol. 32. [www.tinyurl.com/y3o8bmcw](http://www.tinyurl.com/y3o8bmcw)
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* National Geographic introduction to GIS [www.nationalgeographic.org/activity/introduction-gis](http://www.nationalgeographic.org/activity/introduction-gis)
* National Geographic Mapmaker [mapmaker.nationalgeographic.org/](http://mapmaker.nationalgeographic.org/)
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## **Appendix 3**

## **Digital systems 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.
* Indicate what general capabilities and cross-curriculum priorities can be meaningfully addressed in the assessment task.
* 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: xxxx**

**Assessment focus:** Australian Curriculum: Digital Technologies   
(Digital systems – recognise and explore digital systems for a purpose). This task is also linked to xxxx. Depending on modifications made, opportunities may exist to link this task to xxxx and/or xxxx.

**Band:** F–2 (intended cohort xxxx)

**Context:** xxxx

**Duration:** xxxx

**Prior learning:** Students will have:

* xxxx

## **Task summary**

Students will:

* xxxx

**Digital Technologies**

**Achievement standard**

By the end of Year 2, students identify how common digital systems (hardware and software) are used to meet specific purposes. They use digital systems to represent simple patterns in data in different ways.

Students design solutions to simple problems using a sequence of steps and decisions. They collect familiar data and display them to convey meaning. They create and organise ideas and information using information systems, and share information in safe online environments.

**Content descriptions**

|  |
| --- |
| Recognise and explore digital systems (hardware and software components) for a purpose ([ACTDIK001](http://www.scootle.edu.au/ec/search?accContentId=ACTDIK001))  Collect, explore and sort data, and use digital systems to present the data creatively [(ACTDIP003](http://www.scootle.edu.au/ec/search?accContentId=ACTDIP003))  Explore how people safely use common information systems to meet information, communication and recreation needs ([ACTDIP005](http://www.scootle.edu.au/ec/search?accContentId=ACTDIP005))  Create and organise ideas and information using information systems independently and with others, and share these with known people in safe online environments [(ACTDIP006](http://www.scootle.edu.au/ec/search?accContentId=ACTDIP006)) |

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

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

## **Links to the key ideas** [X all 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 and insert ideas about how they could be addressed]

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/)

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

## **Links to ICT Capability continuum: Level [ insert ]** [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, adjust content to the appropriate level.

|  |  |
| --- | --- |
| **Applying social and ethical protocols and practices when using ICT** | |
| acknowledge when they use digital products created by someone else, and start to indicate the source |  |
| independently apply standard guidelines and techniques for particular digital systems to secure digital information |  |
| apply standard guidelines and take action to avoid the common dangers to personal security when using ICT and apply appropriate basic social protocols when using ICT to communicate with unknown audiences |  |
| identify the value and role of ICT use at home and school |  |
| **Investigating with ICT** | |
| use ICT to plan an information search or generation of information, recognising some pattern within the information |  |
| locate, retrieve or generate information from a range of digital sources |  |
| explain why located data or information was selected |  |
| **Creating with ICT** | |
| use ICT to generate ideas and plan solutions |  |
| create and modify simple digital solutions, creative outputs or data representation/transformation for particular purposes |  |
| **Communicating with ICT** | |
| use appropriate ICT tools safely to share and exchange information with appropriate known audiences |  |
| understand that computer mediated communications are directed to an audience for a purpose |  |
| **Managing and operating ICT** | |
| identify and independently operate a range of devices, software, functions and commands, taking into consideration ergonomics when operating appropriate ICT systems, and seek solutions when encountering a problem |  |
| identify and compare the use of the main components of different ICT systems |  |
| manage and maintain digital data using common methods |  |

**Links to Literacy and Numeracy**

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

Xxxx

## **Appendix 4**

## **School map template**

This template is intended for offline use if students are unable to access online tools to annotate a map.

**Appendix 4 ­­– School map template – Count trees**

How many trees can you see in this satellite picture of a school?

Place a stamp or sticker over each tree.

A picture containing text, electronics, circuit, computer

Description automatically generated

*Imagery: Google, ©2021 CNES / Airbus, Maxar Technologies*

Where could trees be planted to provide shade for students?

Place a stamp or sticker for new trees.

A picture containing text, electronics, circuit, computer

Description automatically generated

*Imagery: Google, ©2021 CNES / Airbus, Maxar Technologies*