DTiF
Digital Technologies in focus
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acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY

CLASSROOM IDEAS: YEARS 3–4

Understanding digital systems

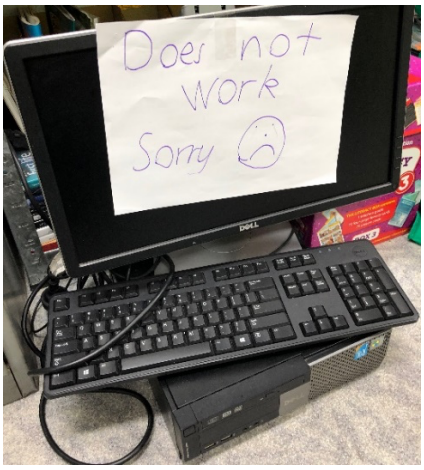

Figure 1: A broken desktop computer could be used to discuss peripheral devices or taken apart to learn about how it functions.

Digital systems are made up of hardware and software components that:

- receive data input
- process and store data
- output data in some way.

We see them all around us in the form of computers, smartphones, smart TVs, and so on.

Digital systems often require peripheral devices to receive data input (for example, via a keyboard, microphone or mouse) and to output it for presentation to a user as text, audio or images (for example, via a monitor, data projector or speakers).

Giving students opportunities to understand how digital systems function can take a range of forms such as discussing the purpose of the system components with an expert, reading a book or watching a video that explains the way a digital system works.

Figure 2: A broken laptop could be used to discuss input and output or to discuss or label internal components.

Year 3–4 students could:

- identify digital systems and their purpose
  - Where are the digital systems in your school? How and why are they used?
- explore components of a digital system
  - Can you take apart a digital system to photograph and label the parts? (see Figures 1 and 2)
  - How might you display and describe your labelled digital system for others to view?
- explore inputs and outputs of a digital system
  - How many ways can the digital system receive input?
  - Does the output require a peripheral device? If so, what?
  - Can you build a model digital system? How could you show input and output? (e.g. with green string to indicate input and red string to indicate data output.)

Links to the Australian Curriculum

Table 1: Aspects of the Australian Curriculum: Digital Technologies version 9 Years 3 and 4 which may be addressed depending upon the task.

Digital Technologies ***Achievement standard***	By the end of Year 4 students create simple digital solutions and use provided design criteria to check if solutions meet user needs. Students process and represent data for different purposes. They follow and describe simple algorithms involving branching and iteration and implement them as visual programs. Students securely access and use digital systems and their peripherals for a range of purposes, including transmitting data. They use the core features of common digital tools to plan, create, locate and share content, and to collaborate, following agreed behaviours. Students identify their personal data stored online and recognise the risks.		
Strand ***Sub-strand***	Digital Technologies knowledge and understanding • Digital systems		
Content descriptions	• explore and describe a range of digital systems and their peripherals for a variety of purposes AC9TDI4K01 • explore transmitting different types of data between digital systems AC9TDI4K02		
Technologies Core concepts	• Systems • Systems thinking	***Digital Technologies Core concepts***	• Digital systems
		General capabilities	• Digital Literacy • Literacy
Cross-curriculum priorities		***Learning area or subject connections***	• HASS (History)

Table 2: Aspects of the Australian Curriculum: Digital Technologies version 8.4 Years 3 and 4 which may be addressed depending upon the task.

Digital Technologies ***Achievement standard***	By the end of Year 4, students describe how a range of digital systems (hardware and software) and their peripheral devices can be used for different purposes. They explain how the same data sets can be represented in different ways. Students define simple problems, design and implement digital solutions using algorithms that involve decision-making and user input. They explain how the solutions meet their purposes. They collect and manipulate different data when creating information and digital solutions. They safely use and manage information systems for identified needs using agreed protocols and describe how information systems are used.		
Strands	Digital Technologies knowledge and understanding • Digital systems		
Content descriptions	• Identify and explore a range of digital systems with peripheral devices for different purposes, and transmit different types of data (ACTDIK007)		
Key concepts	• digital systems	***Key ideas***	Thinking in Technologies • computational thinking
Cross-curriculum priorities		***General capabilities***	• Information and Communication Technology (ICT) Capability • Literacy

Inquiry questions

1. What is the difference between hardware and software?
2. Apart from a computer, what else could be a digital system? Why? (see Figure 3)
3. What other way(s) could output be demonstrated if it is not through audio, text or images?
4. Describe one of the most important digital systems in your community. What does it do? How do you think it works? Why is it important?
5. How could you create a diagram showing data input and output in a digital system you use at school, home or in your community?
6. Which digital system do you think your teacher or parent could not live without? Why? Describe how it works.
7. How quickly do digital systems go out of date? Are there examples of this in your home or school? Why is this?
8. What components can be recycled? How? Why?

Figure 3: How could you use a Bee-Bot to explain input and output or other aspects of a digital system?

Useful links

- The Australian Curriculum: Technologies Glossary https://www.australiancurriculum.edu.au/f-10-curriculum/technologies/glossary/ (V 8.4)
- Australian Computer Academy (ACA) unpack the curriculum, digital systems https://aca.edu.au/curriculum/systems/ (V8.4)
- Digital Technologies Hub – digital systems resources https://www.digitaltechnologieshub.edu.au/teachers/topics/digital-systems

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