DIGITAL TECHNOLOGIES HUB

Australian Curriculum V9.0
Digital systems

Processing data in binary, made up of hardware, controlled by software, and connected to form networks.

ACARA, 2022

Foundation

I can explore common digital systems to see what they do.

Years 1–2

I can identify, and with help, use common digital systems for a purpose and also describe examples of hardware and software.


A computer is a common digital system. Tablets, laptops and smartphones are also digital systems. A digital system uses hardware and software components to enable a user to complete specific tasks.

Explore the basic parts of a digital system and the important role they play. Become familiar with touchscreen or keyboard, monitor or screen and mouse on some devices. How do we type our name? How do we take a photograph of our favourite toy? How do we record our voice?
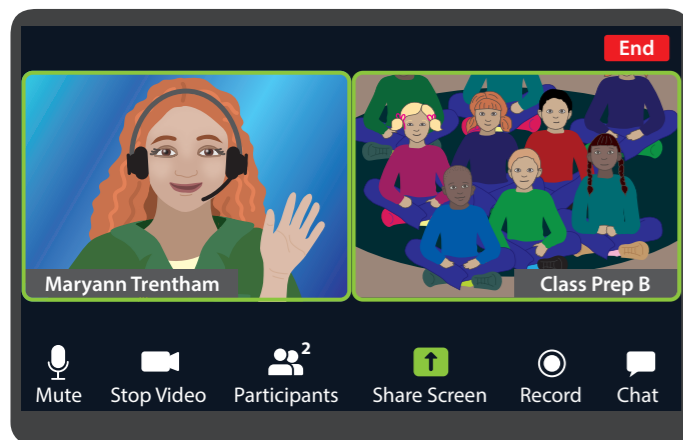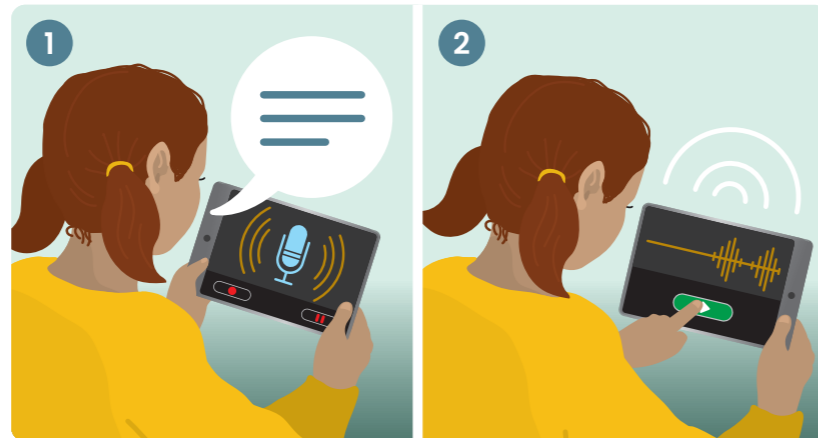
Organise a guest speaker to talk to the class about a topic of interest via video-conferencing software and displayed on a large screen. Enable students to ask questions via a microphone. Discuss parts of the system that make that communication possible.

Create a model of a digital system using materials such as cardboard, paper or playdough. Use questioning to prompt thinking about the hardware and software components as they demonstrate how the digital system operates.

A computer, along with tablets, laptops and smartphones, is a common digital system. These systems use hardware to process and store data, allowing users to interact via a mouse, keyboard or touchscreen. The software provides the device with instructions to enable the user to complete specific tasks using the digital system.

Play an app hunt game to find an application (software) on a digital system such as a tablet to take a photo, draw a picture, write words or record your voice. Follow up by discussing the hardware of the tablet, for example, the screen shows images text and videos, and also a touchscreen for drawing and interacting.

Provide opportunities to use software of digital systems for a purpose related to a class context. Guide students to, for example, type a short recount of an event using word processing, sequence a story using presentation software, create an image using a drawing program, take photographs or record a video using a tablet with a camera.
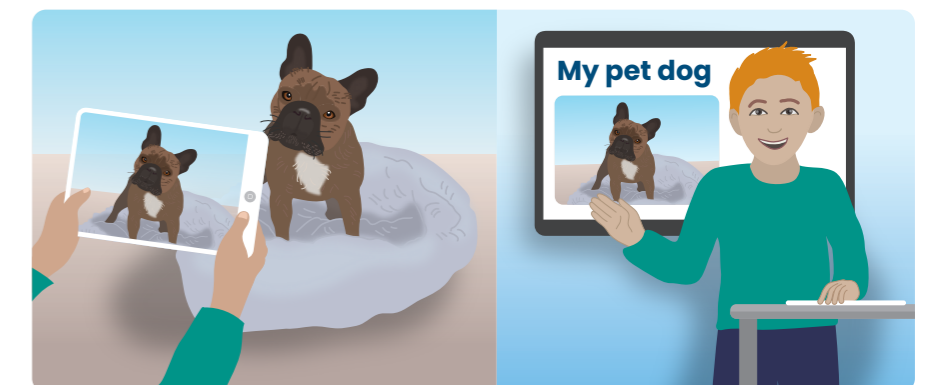
Use a digital system for a purpose, for example, use a tablet device to take a photograph and with guidance share the image in a presentation.

Achievement standard	Students show familiarity with digital systems and use them for a purpose.
Content descriptions	Recognise and explore digital systems (hardware and software) for a purpose	Digital Technologies AC9TDIFK01

Achievement standard	With assistance, students access and use digital systems for a purpose.
Content descriptions	Identify and explore digital systems and their components for a purpose	Digital Technologies AC9TDI2K01

Find more resources at www.dthub.edu.au

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Years 3–4

*I can identify peripherals and describe their purpose.*

Years 5–6

I can describe the role of hardware and software components of digital devices and how digital systems in a network are connected to transmit data.

Digital systems often require peripheral devices to receive input data, for example, via a mouse, a touchscreen or keyboard, and microphone. They then output data to a user as text, audio or images, for example, via a screen or monitor, data projector or speakers. In some digital systems, components like cameras, microphones and keyboards are not built-in and must be added separately. A printer can be connected via a cable or wi-fi.

Use a set of printable cards for activities to sort and classify components of digital systems; in particular, hardware and peripherals. Students can sort into those that receive input data, process and store data or output data.

Input

Output

Create cards for peripherals (printer, keyboard, mouse, webcam, microphone, USB). Distribute them randomly to students. Each student demonstrates how their peripheral integrates with a digital system, showing its use and functionality.

Explore an input device such as Makey Makey to replace keyboard functions. Students can explore game control or playing a musical instrument. Use Scratch to incorporate key pressed functions to assign musical notes to each key.

Digital systems, like computers, need both hardware (physical parts) and software (instructions) to work. They require power, user input, and an operating system that connects the software and hardware. The main parts that process and store data are the CPU and memory storage.

Many digital systems connect to other digital systems: computers via cables, tablets and laptops via wi-fi, and smartphones via mobile networks.

Explore the roles of internal components like the CPU and memory in a digital system. Match cards with the names of digital system parts (CPU, RAM) to their functions (processing data, storing information). Create a comic strip or storyboard illustrating how we access a file such as a video stored on the network.

PLAY | LOCATE VIDEO | START VIDEO | RETRIEVE
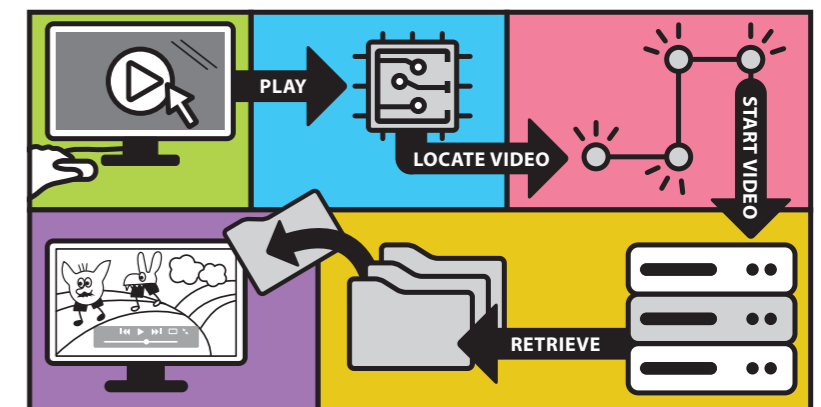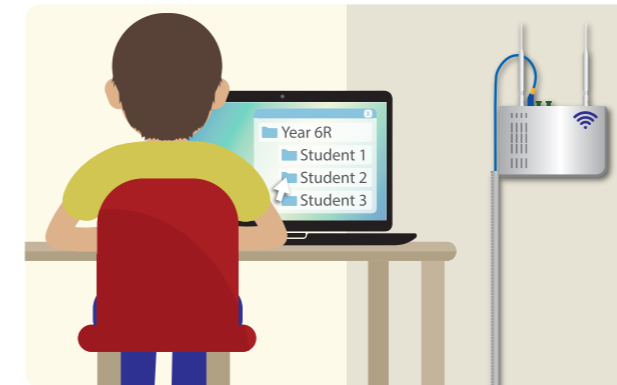
Investigate the school network and its interconnected components used to share resources. Discuss the benefits of a network, such as file storage, sharing, and printer access. Students create a how-to guide explaining these benefits and how to interact with and use the school network.

Use relevant videos or teaching slides to explore the internet and its uses. Discuss how messages are sent between digital systems globally in under a second using packets and IP addresses.

Packet header	
Sender IP	1.1.1.1
Receiver IP	2.2.2.2
Sequence	1 of 3
Payload	"What"

Packet header	
Sender IP	1.1.1.1
Receiver IP	2.2.2.2
Sequence	2 of 3
Payload	"is"

Packet header	
Sender IP	1.1.1.1
Receiver IP	2.2.2.2
Sequence	3 of 3
Payload	"electricity?"

Achievement standard	Students securely access and use digital systems and their peripherals for a range of purposes, including transmitting data.

Content descriptions	Explore and describe a range of digital systems and their peripherals for a variety of purposes | Digital Technologies AC9TDI4K01
	Explore transmitting different types of data between digital systems | Digital Technologies AC9TDI4K02

Achievement standard	They securely access and use multiple digital systems and describe their components and how they interact to process and transmit data.

Content descriptions	Investigate the main internal components of common digital systems and their function | Digital Technologies AC9TDI6K01
	Examine how digital systems form networks to transmit data | Digital Technologies AC9TDI6K02

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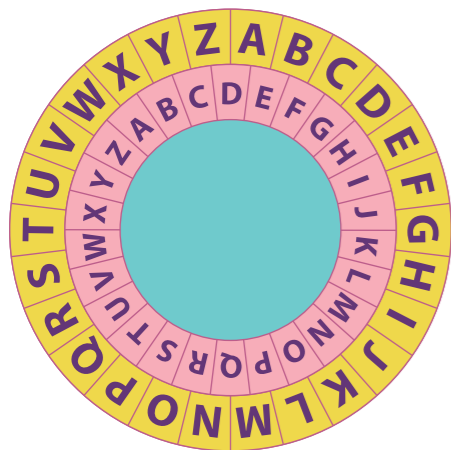
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Years 7–8

I can select appropriate hardware for particular tasks, explain how data is transmitted and secured in networks, and identify cyber security threats.

Years 9–10

I can explain how various protocols and systems are used to manage, control and secure access to data. I can model cyber security threats and explore a vulnerability.

Just as computer hardware components have pros and cons depending on requirements, the performance of physical networks (wired and wireless) can also be compared. Network protocols are used to ensure data is transmitted correctly from one device to another.

Digital systems are vulnerable to various cyber threats, such as phishing and ransomware. Threats can be mitigated through techniques such as email filtering and multi-factor authentication (which enhances the security of passwords).
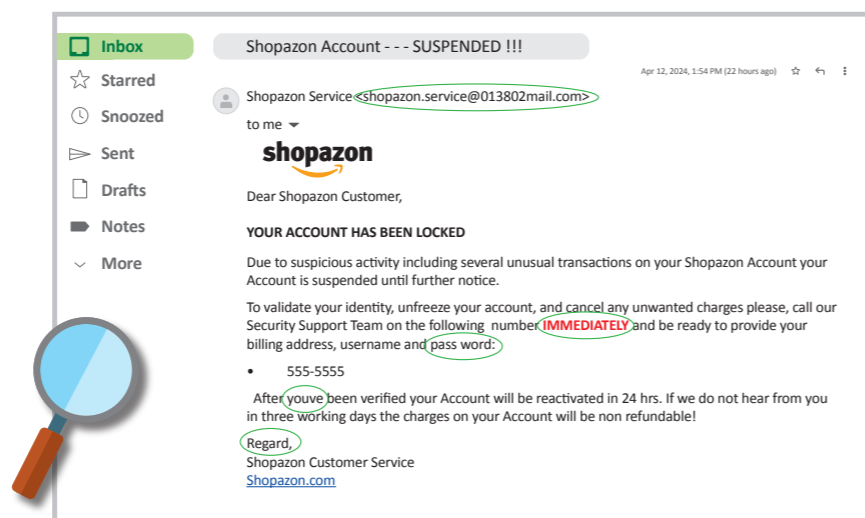
Compare physical networks (wired and wireless) to the ancient networks related to First Nations Peoples' trading practices throughout history, including trade routes.

Computer network	Ancient trade routes
Cables and connections	Paths or trails that connected different trading locations
Routers	Key points along trade routes where decisions were made about which path to take
Protocols (for example, TCP/IP)	Rules and customs that governed trade along the routes

Use interactives and other online resources to practise performing encryption and decryption using custom online tools.

Analyse common phishing scams, gaining a deeper understanding of the techniques used by scammers. Develop rules for AI algorithms to detect these scams, promoting critical thinking about cybersecurity and online safety.

Shopazon Account - - - SUSPENDED !!!

Inbox
Starred
Snoozed
Sent
Drafts
Notes
More

Shopazon Service <shopazon.service@013802mail.com>
Apr 12, 2024, 1:54 PM (22 hours ago)
to me

shopazon

Dear Shopazon Customer,

YOUR ACCOUNT HAS BEEN LOCKED

Due to suspicious activity including several unusual transactions on your Shopazon Account your Account is suspended until further notice.

To validate your identity, unfreeze your account, and cancel any unwanted charges please, call our Security Support Team on the following number **IMMEDIATELY** and be ready to provide your billing address, username and pass word:

- 555-5555

After youve been verified your Account will be reactivated in 24 hrs. If we do not hear from you in three working days the charges on your Account will be non refundable!

Regard,
Shopazon Customer Service
Shopazon.com

Achievement standard	Students select appropriate hardware for particular tasks, explain how data is transmitted and secured in networks, and identify cyber security threats.
Content descriptions	Explain how hardware specifications affect performance and select appropriate hardware for particular tasks and workloads	Digital Technologies AC9TDI8K01
	Investigate how data is transmitted and secured in wired and wireless networks including the internet	Digital Technologies AC9TDI8K02

Internet hardware and software use various protocols and systems to ensure data is correctly delivered from one digital system to another across local networks and across the world.

Encryption techniques make data less readable – and therefore less accessible – so that it can be transmitted more securely across a network and decrypted at its destination.

Create an interactive workshop where students role-play different user roles, demonstrating access control elements like authentication and permissions. For example, demonstrate role-based access to illustrate the necessity of restricting software installation access to administrators only.

Guest   Admin

Annie

Large random number

Key generation program

A Public   A Private
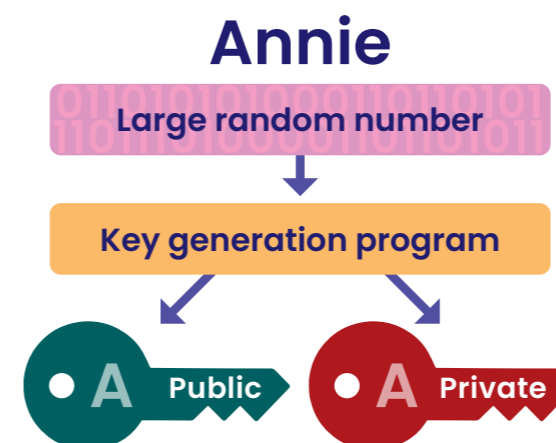
Investigate cryptography and modern encryption methods for transmitting digital data securely. Encryption of data is a means of protecting data, one example being the use of secret and public keys. Students encode and decode a message creating a public key, an encryption key and a private key.

Create an infographic about the role of a cybersecurity professional. Include statistics on cybersecurity importance, threat frequency, impact, and the growing demand for professionals. Illustrate the use of modelling tools such as threat modelling software to identify and assess risks. Include network vulnerabilities like brute force attacks and malware.

Name: Sylvia Preston
Occupation: Cybersecurity professional

Vulnerabilities   **Modelling tools**

Statistics
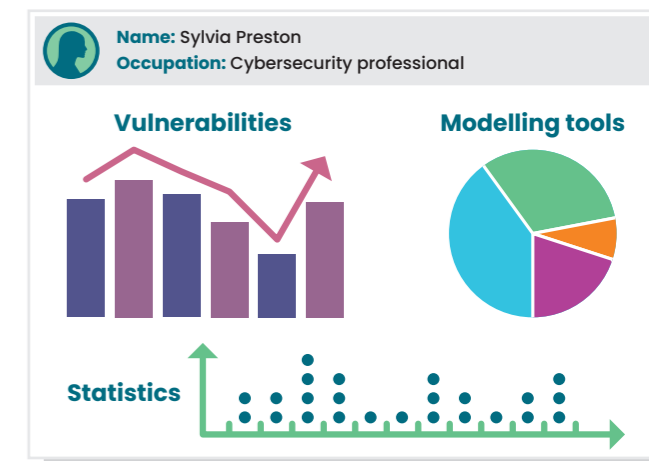
Achievement standard	Students explain how digital systems manage, control and secure access to data; and model cyber security threats and explore a vulnerability.
Content descriptions	Investigate how hardware and software manage, control and secure access to data in networked digital systems	Digital Technologies AC9TDI10K01