In a world that is increasingly digitised and automated, it is critical to the wellbeing and sustainability of the economy, the environment and society, that the benefits of information systems are exploited ethically. This requires deep knowledge and understanding of digital systems (a component of an information system) and how to manage risks. Ubiquitous digital systems such as mobile and desktop devices and networks are transforming learning, recreational activities, home life and work. Digital systems support new ways of collaborating and communicating, and require new skills such as computational and systems thinking. These digital technologies are the ecological problem-solving toolbox in our knowledge-based society.

The Australian Curriculum: Digital Technologies empowers students to shape change by influencing how contemporary and emerging information systems and practices are applied to meet current and future needs. A deep understanding and knowledge of information systems enables students to be creative and discerning decision-makers when they select, use and manage data, information, processes and digital systems to meet needs and shape preferred futures.

Digital Technologies provides students with practical opportunities to use design thinking to become innovative developers of digital solutions and knowledge. The subject helps students to become innovative creators of digital solutions that support the use of systems and critical consumers of information conveyed by digital systems.

Digital Technologies provides students with authentic learning challenges that foster curiosity, confidence, persistence, innovativeness, creativity, respect and cooperation. These are all necessary when using and developing information systems to make sense of complex ideas and relationships in all areas of learning. Digital Technologies helps students to be regional and global citizens capable of actively and ethically communicating and collaborating.

By the end of Year 2, students will have had opportunities to create a range of digital solutions through guided play and integrated learning, such as using robotic toys to navigate a map or recording science data with software applications. In Foundation to Year 2, students begin to learn about common digital devices and patterns they collect. Students organise, manipulate and present this data, including numerical, categorical, textual, image, audio and video data, in creative ways to create meaning.

Students use the concept of abstraction when defining problems, to identify the most important information, such as the significant steps involved in making a sandwich. They begin to develop their design skills by conceptualising algorithms as a sequence of steps for carrying out instructions, such as identifying steps in a process or controlling robotic devices.

Rationale

In a world that is increasingly digitised and automated, it is critical to the wellbeing and sustainability of the economy, the environment and society, that the benefits of information systems are exploited ethically. This requires deep knowledge and understanding of digital systems (a component of an information system) and how to manage risks. Ubiquitous digital systems such as mobile and desktop devices and networks are transforming learning, recreational activities, home life and work. Digital systems support new ways of collaborating and communicating, and require new skills such as computational and systems thinking. These digital technologies are the ecological problem-solving toolbox in our knowledge-based society.

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In addition to the overarching aims for the Australian Curriculum: Technologies, Digital Technologies more specifically aims to develop the knowledge, understanding and skills to ensure that, individually and collaboratively, students:

- design, create, manage and evaluate sustainable and innovative digital solutions to meet and redefine current and future needs;
- use computational thinking and the key concepts of abstraction, data collection, representation and interpretation, specification, algorithms and implementation to create digital solutions;
- critically use digital systems to efficiently and effectively automate the transformation of data and to creatively communicate ideas in a range of settings;
- apply protocols and legal practices that support safe, ethical and responsible communications and collaboration with known and unknown audiences;
- apply systems thinking to monitor, analyse, predict and shape the interactions within and between information systems and the impact of these systems on individuals, societies, economies and environments.

Aims

Through discussion with students, teachers learn to apply safe and ethical practices to protect themselves and others as they interact online for learning and communicating.

Foundation to Year 2 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 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.

Foundation to Year 2 Band Description

Learning in Digital Technologies builds on concepts, skills and processes developed in the Early Years Learning Framework. It focuses on developing foundational skills in computational thinking and an awareness of personal experiences using digital systems.

By the end of Year 2, students will have had opportunities to create a range of digital solutions through guided play and integrated learning, such as using robotic toys to navigate a map or recording science data with software applications. In Foundation to Year 2, students begin to learn about common digital devices and patterns they collect. Students organise, manipulate and present this data, including numerical, categorical, textual, image, audio and video data, in creative ways to create meaning.

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Students describe how information systems meet information, communication and/or recreational needs.

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Foundation to Year 2 Achievement Standard

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Through discussion with teachers, students learn to apply safe and ethical practices to protect themselves and others as they interact online for learning and communicating.
The Australian Curriculum: Digital Technologies (F–10) comprises two related strands:

- Digital Technologies knowledge and understanding – the information components of data, and digital systems (hardware, software and networks)
- Digital Technologies processes and production skills – using digital systems to create ideas and information, and to define, design and implement digital solutions, and evaluate these solutions and existing information systems against specified criteria.

Relationship between the strands
Together, the two strands provide students with knowledge, understanding and skills through which they can safely and ethically exploit the capacity of information systems (people, data, software, and networks and their interactions) to systematically transform data into solutions that respond to the needs of individuals, society, the economy and the environment. Teaching and learning programs will typically integrate these, as content in processes and production skills frequently draws on understanding of concepts in the knowledge and understanding strand.

The strands are based on key concepts that provide a framework for knowledge and practice in Digital Technologies.

**Key concepts**
A number of key concepts underpin the Digital Technologies curriculum. These establish a way of thinking about problems, opportunities and information systems, and provide a framework for knowledge and practice. The key concepts are:

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

The concepts of abstraction, data collection, representation and interpretation, specification, algorithms and implementation correspond to the key elements of computational thinking. Collectively, these concepts span the key ideas about the organisation, representation and automation of digital solutions and information. They can be explored in non-digital and digital contexts and are likely to underpin future digital systems. They provide a language and perspective that students and teachers can use when discussing digital technologies.

**Specification**
Abstraction involves hiding details of an idea, problem or solution that are not relevant, to focus on a manageable number of aspects. Abstraction is a natural part of communication: people rarely communicate every detail, because many details are not relevant in a given context. The idea of abstraction can be acquired from an early age. For example, when students are asked how to make toast for breakfast, they do not mention all steps explicitly, assuming that the listener is an intelligent implementer of the abstract instructions. Central to managing the complexity of information systems is the ability to temporarily ignore the internal details of the subcomponents of larger specifications, algorithms, systems or interactions. In digital systems, everything must be broken down into simple instructions.

Data collection, representation and interpretation
The concepts that are about data focus on the properties of data, how they are collected and represented, and how they are interpreted in context to produce information. These concepts in Digital Technologies build on a corresponding statistics and probability strand in the Mathematics curriculum. The Digital Technologies curriculum provides a deeper understanding of the nature of data and their representation, and computational skills for interpreting data. The data concepts provide foundational experiences for authentic data exploration in other learning areas while developing data processing and visualisation skills. Data collection describes the numerical, categorical and textural facts measured, collected or calculated as the basis for creating information and its binary representation in digital systems. Data collection is addressed in the processes and production skills strand. Data representation describes how data are represented and structured symbolically for storage and communication, by people and in digital systems, and is addressed in the knowledge and understanding strand. Data interpretation describes the processes of extracting meaning from data and is addressed in the processes and production strand.

**Types of digital solutions**
Across each band, students will create digital solutions that will use data, require interactions with users and within systems, and will have impacts on people, the economy and environments. Solutions may be developed using combinations of readily available hardware and software applications, and/or specific instructions provided through programming. Some examples of solutions are instructions for a robot, an adventure game, products featuring interactive multimedia including digital stories, animations and websites.

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**Digital Technologies Processes and Production Skills**

Collect, explore and sort data, and use digital systems to present the data creatively.
Follow, describe and represent a sequence of steps and decisions (algorithms) needed to solve simple problems.
Explore how people safely use common information systems to meet information, communication and recreation needs.
Create and organise ideas and information using information systems independently and with others, and share these with known people in safe online environments.