Australian Curriculum: Digital Technologies key concepts mapping - Years 7 and 8

BAND DESCRIPTION

Learning in Digital Technologies focuses on further developing understanding and skills in computational thinking such as decomposing problems and prototyping; and engaging students with a wider range of information systems as they broaden their experiences and involvement in national, regional and global activities.

By the end of Year 8, students will have had opportunities to create a range of digital solutions, such as interactive web applications or programmable multimedia assets or simulations of relationships between objects in the real world.

In Year 7 and 8, students analyse the properties of networked systems and their suitability and use for the transmission of data types. They acquire, analyse, validate and evaluate various types of data, and appreciate the complexities of storing and transmitting that data in digital systems. Students use structured data to model objects and events that shape the communities they actively engage with.

They further develop their understanding of the vital role that data plays in their lives, and how the data and related systems define and are limited by technical, environmental, economic and social constraints.

They further develop abstractions by identifying common elements while decomposing apparently different problems and systems to define requirements, and recognise that abstractions hide irrelevant details for particular purposes. When defining problems, students identify the key elements of the problems and the factors and constraints at play. They design increasingly complex algorithms that allow data to be manipulated automatically, and explore different ways of showing the relationship between data elements to help computation, such as using pivot tables, graphs and clearly defined mark-up or rules. They progress from designing the user interface to considering user experience factors such as user expertise, accessibility and usability requirements.

They broaden their programming experiences to include general-purpose programming languages, and incorporate subprograms into their solutions. They predict and evaluate their developed and existing solutions, considering time, tasks, data and the safe and sustainable use of information systems, and anticipate any risks associated with the use or adoption of such systems. Students plan and manage individual and team projects with some autonomy. They consider ways of managing the exchange of ideas, tasks and files, and techniques for monitoring progress and feedback. When communicating and collaborating online, students develop an understanding of different social contexts, for example acknowledging cultural practices and meeting legal obligations.

KEY CONCEPTS

The **key concepts** 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. They are:

- ○ **abstraction**, which 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)

ACHIEVEMENT STANDARD

By the end of Year 8, students distinguish between different types of networks and defined purposes. They explain how text, image and audio data can be represented, secured and presented in digital systems.

Students plan and manage digital projects to create interactive information. They define and decompose problems in terms of functional requirements and constraints. Students design user experiences and algorithms incorporating branching and iterations, and test, modify and implement digital solutions. They evaluate information systems and their solutions in terms of meeting needs, innovation and sustainability. They analyse and evaluate data from a range of sources to model and create solutions. They use appropriate protocols when communicating and collaborating online.

CONTENT DESCRIPTIONS

Digital Technologies knowledge and understanding	Digital Technologies processes and production

Digital Technologies knowledge and understanding

Digital systems

● Investigate how data is transmitted and secured in wired, wireless and mobile networks, and how the specifications affect performance (ACTDIK023)

Representation of data

● Investigate how digital systems represent text, image and audio data in binary (ACTDIK024)

Digital Technologies processes and production

Collecting, managing and analysing data

● Acquire data from a range of sources and evaluate authenticity, accuracy and timeliness (ACTDIP025)

● Analyse and visualise data using a range of software to create information, and use structured data to model objects or events (ACTDIP026)

Creating designed solutions by:

Investigating and defining

● Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)

Generating and designing

● Design the user experience of a digital system, generating, evaluating and communicating alternative designs (ACTDIP028)

● Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors (ACTDIP029)

Producing and implementing

● Implement and modify programs with user interfaces involving branching, iteration and functions in a general-purpose programming language (ACTDIP030)

Evaluating

● Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)

Collaborating and managing

● Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)