https://www.australiancurriculum.edu.au/f-10-curriculum/technologies/digital-technologies/?year=12987&strand=Digital+Technologies+Knowledge+and+Understanding&strand=Digital+Technologies+Processes+and+Production+Skills&capability=ignore&capability=Literacy&capability=Numeracy&capability=Information+and+Communication+Technology+%28ICT%29+Capability&capability=Critical+and+Creative+Thinking&capability=Personal+and+Social+Capability&capability=Ethical+Understanding&capability=Intercultural+Understanding&priority=ignore&priority=Aboriginal+and+Torres+Strait+Islander+Histories+and+Cultures&priority=Asia+and+Australia%E2%80%99s+Engagement+with+Asia&priority=Sustainability&elaborations=true&elaborations=false&scotterms=false&isFirstPageLoad=false

**Digital Technologies Knowledge and Understanding**

Investigate the role of hardware and software in managing, controlling and securing the movement of and access to data in networked digital systems (ACTDIK034 - Scootle )

* explaining how an operating system manages the relationship between hardware, applications and system software
* comparing the similarities and differences of two common operating systems
* identifying how changes to the configuration of an operating system change the operation of hardware and software components in a networked digital system
* explaining the role of hardware and software components in allowing people to interact with digital systems, for example using a mouse or touch pad or screen, speech, accelerometer
* investigating the operation and use of robotic process control systems
* explaining encryption of data as a means of protecting data, for example secret keys and ‘exclusive or’ (XOR) and hashing algorithms to digitally sign data

Analyse simple compression of data and how content data are separated from presentation (ACTDIK035 - Scootle )

* explaining how simple compression schemes reduce the size of repetitive data, for example how run length encoding reduces the size of images
* explaining the difference between lossy and lossless compression, for example the difference between JPEG and PNG images
* explaining codecs for audio-visual compression, for example common codecs for video formats
* generating a layout or report in a database or applying a style sheet to a web page

**Digital Technologies Process and Production Skills**

Develop techniques for acquiring, storing and validating quantitative and qualitative data from a range of sources, considering privacy and security requirements (ACTDIP036 - Scootle )

* developing strategies and techniques for capturing accurate and usable qualitative and quantitative data of different formats, for example using text entry for open-ended questions to acquire qualitative data; using radio buttons or checkboxes for closed questions to acquire quantitative data
* identifying strengths and weaknesses of collecting data using different methods, for example online surveys, face-to-face interviews, phone interviews, observation, blog entries in response to a posting, phone logs, browser history and online webcam systems
* developing strategies to ensure the privacy and security of survey data, for example using numbers rather than names as identifiers; password protecting files to reduce risks of modifying data and using CAPTCHA™ to confirm human responses
* extracting specific data from an external source and storing it in a format that is more useful for analysis, for example combining mapping data from multiple electronic data sets to build a composite representation

Analyse and visualise data to create information and address complex problems, and model processes, entities and their relationships using structured data (ACTDIP037 - Scootle )

* using visualisation software tools to identify patterns and relationships between sets of data and information, and support abstract reasoning, for example representing data using histograms, network diagrams and maps
* summarising data using advanced filtering and grouping techniques, for example pivot tables in spreadsheets and aggregation functions in databases
* automating calculations, for example using absolute cell referencing to automatically extend formulas, and automating arithmetic calculations using built-in functions such as trigonometry, compound interest
* simulating simple, iterative processes, for example modelling compound interest or ecological models using a spreadsheet
* documenting the attributes of complex objects and processes using a data dictionary
* interpreting schemas that represent relationships between entities and querying data across tables, for example using foreign keys to represent relationships and joining tables in structured query language (SQL) SELECT statements

Define and decompose real-world problems precisely, taking into account functional and non-functional requirements and including interviewing stakeholders to identify needs (ACTDIP038 - Scootle )

* developing a preliminary specification for an opportunity or a need that typically contains a problem statement, a set of solution needs expressed as functional and non-functional requirements, any assumptions or constraints to be considered and the scope or boundaries of the solution
* investigating different types of functional requirements for solutions, for example increasing the speed of processing, calculating new results, improving the quality of reports
* investigating different types of non-functional requirements for solutions, for example considering how the requirements of reliability, user-friendliness, portability and robustness could affect the way people use solutions
* identifying the range of stakeholders who are associated with solutions but are not direct users and using techniques such as interviewing and reinterviewing to clarify needs
* using software such as graphic organisers to determine a fundamental cause of a problem or to represent related elements of a problem that need to be jointly addressed in the digital solution
* testing a range of text and graphical user interface designs with clients who have different needs on the basis of time taken to complete the task and the number of errors made

Design the user experience of a digital system by evaluating alternative designs against criteria including functionality, accessibility, usability, and aesthetics (ACTDIP039 - Scootle )

* designing the user interface of a solution using story boards and mock-ups, for example mocking up the product design of an app for people with disability
* identifying similar digital systems and existing user interfaces, assessing whether their elements can be reused
* evaluating aspects of the total user experience, that is, all aspects of the system as perceived by the users, for example, a user’s initial experience of setting up and using a system, or a user’s emotional or cultural response to using a digital system
* designing documentation, branding, and marketing for a digital solution, for example a product demonstration screencast or ‘getting started’ user guide
* applying the principles and elements of design to a client’s requirements and evaluating the success of a solution through an iterative feedback process, for example using customer feedback to refine a user interface to more effectively provide access to important features

Design algorithms represented diagrammatically and in structured English and validate algorithms and programs through tracing and test cases (ACTDIP040 - Scootle )

* designing algorithms to solve real-world problems and describing algorithms using flow charts and structured English, for example START, END, IF and UNTIL
* recognising that different algorithms can solve a problem with different trade-offs
* tracing algorithms to predict results and program state for a given input, for example desk checking or using an interactive debugging tool
* using tracing techniques to test algorithms, for example desk checking an algorithm for a given input by stepping through the algorithm while keeping track of contents of the variables
* developing test cases that correspond to the requirements of the specifications, for example validating program behaviour on a range of valid and invalid user input

Implement modular programs, applying selected algorithms and data structures including using an object-oriented programming language (ACTDIP041 - Scootle )

* coding separate modules that perform discrete functions but collectively meet the needs of the solution
* defining classes that represent the attributes and behaviour of objects in the real world or in a game
* considering different algorithms and selecting the most appropriate based on the type of problem, for example choosing appropriate algorithms for particular problems
* selecting different types of data structures such as an array, record and object to model structured data

Evaluate critically how student solutions and existing information systems and policies, take account of future risks and sustainability and provide opportunities for innovation and enterprise (ACTDIP042 - Scootle )

* investigating actions, devices and events that are potential risks to information systems, for example losing portable storage devices containing important files, deliberately infecting systems through malware, and power surges
* investigating techniques used by people and organisations to shape how information systems are used, for example refusing to use innovations, using social media to advocate behaviours, purchasing devices, withdrawing previous processes that can now only be performed by an information system
* investigating the impact and opportunities created through the practice of planned obsolescence, for example discussing the benefits and risks to users, the creators and the environment of information systems having a defined life span, taking into account costs, research and resource extraction
* examining the ICT policy for schooling and evaluating the impact on education
* reviewing the ‘terms of use’ policies on social media networks and predicting ways in which these can support advocacy of change and protection of individuals and societies
* reviewing state, national and regional policies and analysing the potential impact of each. Examples of policies include: Australian Government Protective Security Policy Framework, the Australian Government ICT Sustainability Plan 2010–2015; the Green Growth Policy in Korea and the Korean National Strategy for Sustainable Development

Create interactive solutions for sharing ideas and information online, taking into account safety, social contexts and legal responsibilities (ACTDIP043 - Scootle )

* investigating legal responsibilities of organisations regarding the storage, communication and disposal of personal and organisational data, for example the Australian Privacy Principles as they apply to intellectual property
* applying techniques to make ethical decisions when faced with dilemmas about security and ownership of data, for example selecting an action that results in the greatest benefit for the most number of people; avoiding the use of photos of deceased persons from Aboriginal and Torres Strait Islander communities
* creating an interactive web-based project that provides enterprising opportunities and complies with accessibility requirements, for example using fragments of a web language to create dynamic content that supports interactivity
* creating online interactive solutions for working with others by combining or modifying online software tools to support project work

Plan and manage projects using an iterative and collaborative approach, identifying risks and considering safety and sustainability (ACTDIP044 - Scootle )

* managing and modifying the development of a solution, for example using software to record and monitor project tasks, responsibilities and timeframes and to organise continuous opportunities to review progress with collaborative partners and to conduct regular unit testing
* developing an evolutionary prototype iteratively and incrementally, for example regularly revising features of an application in response to user feedback and development decisions
* investigating indicators of economic success, for example the capacity to scale up an innovative solution to meet the demands of a mass market and the savings accrued through sustainable practices
* investigating major causes of threats to data, for example human actions such as losing a storage device, disclosing passwords, theft and fraud