Technologies – Digital Technologies scope and sequence: Levels 7 to 10

| **Levels 7 and 8** | **Levels 9 and 10** |
| --- | --- |
|  |  |  |  |  |
| By the end of Level 8, students select appropriate hardware for particular tasks. They explain how data is transmitted and secured in networks. Students identify and describe cyber security threats.Students represent data using integers and binary. They acquire, manipulate and validate data using spreadsheets and single-table databases. Students interpret, model and visualise data using spreadsheets and database queries to draw conclusions. They select and use a range of digital tools to create, locate and communicate content, applying common conventions. Students use a range of digital tools to plan tasks, share content online, and manage individual and collaborative iterative projects. They manage their digital footprint and privacy when collecting data.Students define and decompose real-world problems, and determine functional requirements and constraints. They design and trace algorithms using flowcharts and pseudocode. Students design and modify user interfaces and user experiences, and evaluate alternative designs. They implement algorithms and debug programs using a general-purpose programming language. Students evaluate digital solutions against the functional requirements.  | By the end of Level 10, students explain how digital systems manage, control and secure access to data in networks. They model and evaluate cyber security threats and vulnerabilities.Students describe a range of data compression techniques. They represent documents as content, structure and markup. Students acquire, manipulate and validate data using spreadsheets and relational databases. They interpret, model and visualise data using spreadsheets, and relational databases using queries, to draw conclusions and identify trends. Students use advanced features of digital tools to create and communicate interactive content for an audience. They use project management tools to plan and manage individual and collaborative iterative projects. Students identify and apply privacy principles to manage digital footprints.Students decompose real-world problems, identify needs, and determine functional and non-functional requirements. They design, validate and test algorithms using flowcharts and pseudocode. Students design and prototype user interfaces and user experiences, and evaluate alternative designs against design criteria. They implement algorithms and debug programs using an object-oriented programming language. Students critically evaluate digital solutions against user needs and the functional and non-functional requirements.  |
| Content descriptions |
| Strand: Digital Systems and Security |
| *Students learn to:* |
| explain how hardware specifications affect performance and select appropriate hardware for particular tasks and workloadsVC2TDI8S01 | investigate how hardware and software manage, control and secure access to data in networked digital systemsVC2TDI10S01 |
| investigate how data is transmitted and secured in wired and wireless networks including the internetVC2TDI8S02 |  |
| explain how multi-factor authentication protects an account when the password is compromised and identify phishing and other cyber security threatsVC2TDI8S03 | develop cyber security threat models, and explore a software, user or software supply chain vulnerabilityVC2TDI10S02 |
| Strand: Data, Information and Privacy |
| *Students learn to:* |
| investigate how digital systems represent text, image and audio data using integers and binaryVC2TDI8D01 | investigate simple data compression techniquesVC2TDI10D01 |
|  | represent documents online as content (text), structure (markup) and presentation (styling) and explain why such representations are importantVC2TDI10D02 |
| acquire, store, manipulate and validate data from a range of sources using software tools, including spreadsheets and single-table databasesVC2TDI8D02 | develop techniques to acquire, store, manipulate and validate data from a range of sources using software tools, including spreadsheets and relational databasesVC2TDI10D03 |
| analyse and visualise data using a range of software, including spreadsheets and simple database queries, draw conclusions and make predictions by identifying trendsVC2TDI8D03 | analyse and visualise data interactively using a range of software, including spreadsheets and relational databases and queries, to draw conclusions and make predictions by identifying trends and outliersVC2TDI10D04 |
| select and use a range of digital tools effectively, including unfamiliar features, to create, locate and communicate content, consistently applying common conventions for a diverse audienceVC2TDI8D04 | select and use emerging digital tools and advanced features to create and communicate interactive content for a diverse audienceVC2TDI10D05 |
| select and use a range of digital tools effectively and responsibly to share content online, and plan and manage individual and collaborative iterative projectsVC2TDI8D05 | use simple project management tools to plan and manage individual and collaborative iterative projects, accounting for risks and responsibilitiesVC2TDI10D06 |
| investigate and manage the digital footprint that existing systems and student solutions collect, and assess if the data is essential to their purposeVC2TDI8D06 | apply the Australian Privacy Principles to critique and manage the digital footprint that existing systems and student solutions collectVC2TDI10D07 |
| Strand: Creating Digital Solutions |
| *Students learn to:* |
| define and decompose real-world problems by taking into account functional requirements and constraintsVC2TDI8C01 | define and decompose real-world problems, taking into account functional and non-functional requirements and by interviewing and surveying stakeholders to identify needsVC2TDI10C01 |
| design algorithms involving nested control structures and represent them using flowcharts and pseudocode, and use tracing techniques to test and identify errorsVC2TDI8C02 | design algorithms involving logical operators and represent them as flowcharts and pseudocode, and validate algorithms and programs by comparing their output against a range of test casesVC2TDI10C02 |
| design and modify the user interface and user experience of a digital system; generate, communicate and evaluate the alternative designsVC2TDI8C03 | design, modify and prototype the user interface and user experience of a digital system; generate, communicate and critically evaluate alternative designs against design criteriaVC2TDI10C03 |
| implement, modify and debug programs involving control structures and functions in a general-purpose programming languageVC2TDI8C04 | implement, modify and debug modular programs, applying selected algorithms and data structures, including in an object-oriented programming languageVC2TDI10C04 |
| evaluate existing and student-created solutions against the requirements, constraints and possible future impactsVC2TDI8C05 | evaluate existing and student-created solutions against the requirements and design criteria, user needs, possible future impact and opportunities for enterprise and innovationVC2TDI10C05 |

##