

Australian Curriculum: Digital Technologies Years 9 and 10

BAND LEVEL DESCRIPTION

By the end of Year 10 students should have had the opportunity to apply computational thinking by defining and decomposing real-world problems, creating user experiences, designing and modifying algorithms, and implementing them, including in an object-oriented programming language. Students use techniques, including interviewing stakeholders to develop user stories, to increase the precision of their problem definitions and solution specifications. They verify their solutions solve the problem by validating their algorithms, represented as flowcharts and pseudocode, and using test cases to confirm the correctness of their solutions. Students develop their object-oriented programming skills, and apply them to develop, modify and debug programs. They explain the importance of abstraction by representing online documents in terms of content, structure and presentation, as well as exploring simple data compression techniques and comparing their effectiveness.

Students consolidate their skills in data acquisition and interpretation, cleaning and validating data to ensure it is accurate, consistent and domain appropriate. They model multidimensional data in more complex spreadsheets and relational databases, filtering and querying it to give insights into its meaning, and to pose further questions or make conclusions. They visualise this data in customisable ways, allowing greater exploration of trends and outliers to support or challenge their analyses.

Students apply design thinking by using divergent techniques to generate design ideas for user experiences and solutions. They filter and prototype these ideas, developing user stories and applying design criteria based on current and future needs and enterprising opportunities, as well as their created user stories, and revise and further develop their preferred ideas based on their analysis. Students extend on these design criteria and user stories to evaluate the enterprise opportunities and future impact of existing solutions.

Students consolidate their systems thinking by exploring how the hardware and software components of digital systems interact to manage, control and secure access to data. They increasingly use advanced features of existing and emerging digital tools to create interactive content for a diverse audience. They explore simple tools that help plan tasks, timelines and responsibilities for individual and collaborative projects. Students extend their knowledge of the importance of security by developing cyber security threat models and exploring an example of a supply chain vulnerability. They critique the digital footprint created by existing systems and their own solutions by applying the Australian Privacy Principles.

In Digital Technologies, students should have frequent opportunities for authentic learning by making key connections to other learning areas.

ACHIEVEMENT STANDARD

By the end of Year 10 students develop and modify innovative digital solutions, decompose real-world problems, and critically evaluate alternative solutions against stakeholder elicited user stories. Students acquire, interpret and model complex data with databases and represent documents as content, structure and presentation. They design and validate algorithms and implement them, including in an object-oriented programming language. Students explain how digital systems manage, control and secure access to data; and model cyber security threats and explore a vulnerability. They use advanced features of digital tools to create interactive content, and to plan, collaborate on and manage agile projects. Students apply privacy principles to manage digital footprints.

CONTENT DESCRIPTIONS

Digital Technologies knowledge and understanding

Digital systems

investigate how hardware and software manage, control and secure access to data in networked digital systems AC9TDI10K01

Data representation

represent documents online as content (text), structure (markup) and presentation (styling) and explain why such representations are important AC9TDI10K02

investigate simple data compression techniques AC9TDI10K03

Digital Technologies processes and production skills

Acquiring, managing and analysing data

develop techniques to acquire, store and validate data from a range of sources using software, including spreadsheets and databases AC9TDI10P01

analyse and visualise data interactively using a range of software, including spreadsheets and databases, to draw conclusions and make predictions by identifying trends and outliers AC9TDI10P02

model and query entities and their relationships using structured data AC9TDI10P03

Investigating and defining

define and decompose real-world problems with design criteria and by interviewing stakeholders to create user stories AC9TDI10P04

Generating and defining

design algorithms involving logical operators and represent them as flowcharts and pseudocode AC9TDI10P05

validate algorithms and programs by comparing their output against a range of test cases AC9TDI10P06

design and prototype the user experience of a digital system AC9TDI10P07

generate, modify, communicate and critically evaluate alternative designs AC9TDI10P08

Producing and implementing

implement, modify and debug modular programs, applying selected algorithms and data structures, including in an object-oriented programming language AC9TDI10P09

Evaluating

evaluate existing and student solutions against the design criteria, user stories, possible future impact and opportunities for enterprise AC9TDI10P10

Collaborating and managing

select and use emerging digital tools and advanced features to create and communicate interactive content for a diverse audience AC9TDI10P11

use simple project management tools to plan and manage individual and collaborative agile projects, accounting for risks and responsibilities AC9TDI10P12

Privacy and security

develop cyber security threat models, and explore a software, user or software supply chain vulnerability AC9TDI10P13

apply the Australian Privacy Principles to critique and manage the digital footprint that existing systems and student solutions collect AC9TDI10P14

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