



Western Australian Curriculum

Technologies | Digital Technologies

Proposed Comparison of Curriculum | Years 7–10

Draft for consultation | Not for implementation

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Acknowledgement of Country

Kaya. The School Curriculum and Standards Authority (the Authority) acknowledges that our offices are on Whadjuk Noongar boodjar and that we deliver our services on the country of many traditional custodians and language groups throughout Western Australia. The Authority acknowledges the traditional custodians throughout Western Australia and their continuing connection to land, waters and community. We offer our respect to Elders past and present.

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Overview

The current Western Australian Curriculum: Technologies was adopted from the Australian Curriculum version 8.1.

Western Australia provided feedback to the Australian Curriculum, Assessment and Reporting Authority (ACARA) during the consultation for the Australian Curriculum.

The proposed revisions to the Western Australian Curriculum: Technologies are adopted and adapted from the Australian Curriculum version 9.

Guide to reading this document

The first row contains the current Western Australian Curriculum: Technologies curriculum content organised in year levels. The second row contains the endorsed content for Australian Curriculum version 9. The content listed for the Western Australian Curriculum and the Australian Curriculum version 9 is unedited. The third row contains the proposed content for consultation.

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Knowledge and understanding

Digital systems				
	Year 7	Year 8	Year 9	Year 10
Current WA Curriculum	Different types of networks, including wired, wireless and mobile networks	Methods of data transmission and security in wired, wireless and mobile networks	Role of hardware and software in managing, controlling and securing the movement of data in a digital system	Role of hardware and software in managing, controlling and securing access to data, in networked digital systems
	Hardware components of a network	Specifications of hardware components and their impact on network activities		
Australian Curriculum v9 – Digital systems	explain how hardware specifications affect performance and select appropriate hardware for particular tasks and workloads		investigate how hardware and software manage, control and secure access to data in networked digital systems	
	investigate how data is transmitted and secured in wired and wireless networks including the internet			
Australian Curriculum v9 – Privacy and security	explain how multi-factor authentication protects an account when the password is compromised and identify phishing and other cybersecurity threats		develop cybersecurity threat models, and explore a software, user or software supply chain vulnerability	
Proposed WA Curriculum	<p>Methods of data transmission in different types of networks including wired, wireless and mobile networks</p> <p>For example:</p> <ul style="list-style-type: none"> wireless and wired connectivity has advantages and disadvantages mobile networks transfer data and their rates differ between mobile, wired and wireless (wi-fi) networks 	<p>Methods of data transmission and security in wired, wireless and mobile networks, including cybersecurity threats</p> <p>For example:</p> <ul style="list-style-type: none"> data is structured and transmitted through a network, such as broken up into data packets (small pieces) and passed from the source, through multiple devices, in order, to the destination and returned to the original source strategies are necessary to mitigate common security threats, such as phishing common security strategies including VPNs, antivirus software, encryption, multi-factor authentication, etc. ping and/or traceroute commands show network connectivity 	<p>Role of hardware and software to manage, control and secure the movement of data in a digital system</p> <p>For example:</p> <ul style="list-style-type: none"> simple network configurations using real or simulated hardware allows for the observation of packets moving around the network, such as monitoring packets on simulated switches and networked devices domain names and IP addresses allow data to be transmitted to specific networked devices, such as DNS and routing tables the Internet of Things (IoT) is used as part of a networked digital system, such as using sensors and digital systems to collect and share data over the internet and with identified security risks common network security mitigation strategies include firewalls, intrusion detection software, etc. 	<p>Hardware and software are used to manage, control and secure access to data in networked digital systems with a focus on cybersecurity threat models</p> <p>For example:</p> <ul style="list-style-type: none"> public key cryptography, such as TLS, and hashing, such as SHA-1, secure the storage and transmission of data private information moves through a system and can be identified as the most likely target of a cyber attack. Data packets can be mapped when moving between the user and server when in web application. Sending data in plain text becomes susceptible to a 'man-in-the-middle' attack networks can be configured by using real or simulated hardware where packets move around the network, with various levels of network efficiency data moves through a network based on layers of the TCP/IP model
	<p>Hardware devices of networks and their purposes</p> <p>For example:</p> <ul style="list-style-type: none"> common hardware devices in networks include router (home and corporate), switch and servers simple network diagrams can be used to identify network devices and the transmission media 	<p>The effect of hardware specifications on performance and the appropriateness of hardware for particular tasks</p> <p>For example:</p> <ul style="list-style-type: none"> select appropriate hardware for particular tasks, such as choosing a powerful graphics card for computer gaming or large external storage for video editing network properties, such as the bandwidth, latency and reliability of wired, wireless and mobile networks can be compared 		

Data representation

	Year 7	Year 8	Year 9	Year 10
Current WA Curriculum	Digital systems represent text, image and audio data	Binary is used to represent data in digital systems	Different methods of manipulation, storage and transmission of data	Simple compression of data and how content data is separated from presentation data
Australian Curriculum v9	investigate how digital systems represent text, image and audio data using integers		represent documents online as content (text), structure (markup) and presentation (styling) and explain why such representations are important	
	explain how and why digital systems represent integers in binary		investigate simple data compression techniques	
Proposed WA Curriculum	<p>Digital systems use binary to represent data in text</p> <p>For example:</p> <ul style="list-style-type: none"> binary is used to represent electrical signals inside a computer circuit or system computers use transistors to control the flow of electricity to perform calculations, originating from the use of relays in early computer systems whole numbers can be represented in binary, such as counting in binary from 0 to 31, and recognising one byte = 8 bits, which can represent from 0 to 255. These can be represented as numbered cards digital systems represent text as a sequence of individual characters numbered using the Unicode character set, such as upper-case and lower-case letters, punctuation and emojis digital systems represent data in binary, such as by converting a character to its Unicode or ASCII value, then converting that value into binary 	<p>Digital systems represent image and audio data using binary</p> <p>For example:</p> <ul style="list-style-type: none"> digital systems represent bitmap images (such as PNG and JPEG) as the colour of each pixel in separate red, green and blue (RGB) channels ranging from 0 to 255, and represent vector graphics, such as Scalable Vector Graphics (SVG) using the geometry of lines and shapes digital systems represent audio using whole numbers for the amplitude of soundwaves at a given sampling rate, such as -32,768 to 32,767 for 16-bit audio at 44,100 Hz 	<p>Different methods of manipulation and storage of data</p> <p>For example:</p> <ul style="list-style-type: none"> video and sound manipulation software can effect file storage different image manipulation techniques (compression, cropping, exporting, etc.) have effects on file sizes manipulation of images/videos can occur through the use of artificial intelligence, such as 'deepfakes' 	<p>Represent documents online as content (text), structure (mark-up) and presentation (styling) and the purpose of these distinctions</p> <p>For example:</p> <ul style="list-style-type: none"> documents are represented by separating content (the text in the document), structure (the document structure, such as headings and paragraphs) and presentation (document lay out and style) in digital publications correct HTML tags to allow for accessibility, such as screen readers maintenance and updating of content and/or style is easier with correct document structure
	<p>Issues relating to a user's digital footprint and the permanence of data</p> <p>For example:</p> <ul style="list-style-type: none"> data, images or both posted online can lead to information resurfacing at a later date, such as a social media post or a video associating a person with both their comment and the content 	<p>Ethical issues relating to the collection and ownership of data</p> <p>For example:</p> <ul style="list-style-type: none"> the importance of verifying the source and origin of data, in conducting research to assess the credibility and trustworthiness of data providers. Encourage critical thinking and scepticism when encountering data from unfamiliar or dubious sources fact-checking methodologies and tools to cross-reference sources and evaluate the authenticity of data collected 	<p>Data compression techniques for an intended purpose</p> <p>For example:</p> <ul style="list-style-type: none"> algorithms can be used to identify patterns in data and represent them in a compressed way, such as repeated pixels in an image with run length encoding explore the difference between 'lossy and lossless' compression and the consequences of each, by exploring audiovisual compression and the impact of different formats, such as MP3, MP4, JPEG, WAV or RAW on file size and quality 	<p>Australian Privacy Principles regarding the collection and ownership of data</p> <p>For example:</p> <ul style="list-style-type: none"> online services allow control access to user data in line with the Australian Privacy Principles, such as assessing whether users' social media accounts allow for them to update their contact information and who else can see that information on the platform Australian Privacy Principles can be used to reference and evaluate the steps users take to protect information, such as how companies are storing user information so that a data breach

	Year 7	Year 8	Year 9	Year 10
				<p>does not expose their users to security vulnerabilities</p> <ul style="list-style-type: none"> websites contain individual privacy policies that can be investigated

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Processes and production skills

Acquiring, managing and analysing data

	Year 7	Year 8	Year 9	Year 10
Current WA Curriculum – Collecting, managing and analysing data	Explore how to acquire data from a range of digital sources	Evaluate the authenticity, accuracy and timeliness of acquired data	Explore techniques for acquiring, storing and validating quantitative and qualitative data	Apply techniques for acquiring, storing and validating quantitative and qualitative data from a range of sources, considering privacy and security requirements
	Create information using relevant software, and create data to model objects and/or events	Evaluate and visualise data, using a range of software, to create information, and use structured data to model objects or events	Analyse and visualise data to create information and address complex problems	Analyse, visualise and model processes and entities, and their relationships, using structured data
Australian Curriculum v9 – Collecting, managing and analysing data	acquire, store and validate data from a range of sources using software, including spreadsheets and databases		develop techniques to acquire, store and validate data from a range of sources using software, including spreadsheets and databases	
	analyse and visualise data using a range of software, including spreadsheets and databases, to draw conclusions and make predictions by identifying trends		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	
	model and query the attributes of objects and events using structured data		model and query entities and their relationships using structured data	
Proposed WA Curriculum	<p>Acquire, store and visualise data from a range of sources using spreadsheets</p> <p>For example:</p> <ul style="list-style-type: none"> multidimensional data can be visualised by choosing appropriate graphs using spreadsheets, such as a scatter plot of food prices and sales coloured by each food’s sugar content, or diagrams, like a social network diagram, or maps of crime rates by location 	<p>Analyse and validate data using spreadsheets to draw conclusions and make predictions by identifying trends</p> <p>For example:</p> <ul style="list-style-type: none"> data that is based on its attributes can be used to identify trends and to make predictions, such as the use of a spreadsheet to sort crime data by type of offence, to predict future trends 	<p>Acquire, store and validate data from a range of sources using software, including spreadsheets and databases</p> <p>For example:</p> <ul style="list-style-type: none"> different methods of data collection surveys, face-to-face interviews, phone interviews, observation, comments in response to a social media posting, phone logs, browser history and online webcam systems have strengths and weaknesses accessing, storing and manipulating data from the Australian Bureau of Statistics in a format that is useful for analysis, such as using a spreadsheet to acquire, filter, group and sort data on population growth across age groups in Australia systems can be developed that check data is correct and meaningful using automated techniques and manual analysis, such as, validating movie review data using rules and user interface elements, and detecting bias and fake reviews through simple statistical analysis 	<p>Analyse and visualise data interactively using a range of software, including spreadsheets and relational databases, to draw conclusions and make predictions by identifying trends and outliers</p> <p>For example:</p> <ul style="list-style-type: none"> interactive visualisations are used for exploring complex data, for example population, life expectancy and fertility rate in motion charts explore machine learning, a form of artificial intelligence where an algorithm is trained using a dataset, for example to classify images into categories

	Year 7	Year 8	Year 9	Year 10
		<p>Evaluate the authenticity, accuracy and timeliness of acquired data</p> <p>For example:</p> <ul style="list-style-type: none"> critical thinking and scepticism should be employed when encountering data from unfamiliar or dubious sources 	<p>Single table (flat file) databases are created to store and manage data</p> <p>For example:</p> <ul style="list-style-type: none"> single table (flat file) databases are used to store data in a structured manner with tables, records, fields and primary keys 	<p>Model and query entities and their relationships using structured data</p> <p>For example:</p> <ul style="list-style-type: none"> modelling entities and processes, their attributes, and the relationships between them. Creating database tables for a movie, a user and their movie review, where a movie has a title, genre and release date, and a review has a movie, a user and their rating and comments interpreting and querying multi-table databases using SQL queries with SELECT, WHERE and simple JOIN/GROUP BY clauses and counting, such as checking that each teacher is only allocated to one class at a time

Digital implementation

	Year 7	Year 8	Year 9	Year 10
Current WA Curriculum	Design the user experience of a digital system	Design the user experience of a digital system	Design the user experience of a digital system	Design algorithms represented diagrammatically and in structured English, including iteration
	Create digital solutions that include a user interface where choices can be made	Design plans, using a sequence of steps, and represent them diagrammatically and in English, to solve a problem and to predict output for a given input to identify errors	Design algorithms, represented diagrammatically and in structured English, and validate plans and programs through tracing	Validate algorithms and programs using common acceptable methods
	Create and communicate information collaboratively online, taking into account social contexts	Implement and modify solutions, that include user interfaces within a programming environment, including the need for choice of options and/or repeating options	Implement and apply data storage and organisation techniques	Implement data storage and organisation techniques within a programming environment
		Create and communicate interactive ideas collaboratively online, taking into account social contexts	Create and use interactive solutions for sharing ideas and information online, taking into account social contexts	Create interactive solutions for sharing ideas and information online, taking into account social contexts and legal responsibilities
Australian Curriculum v9 – Investigating and defining	decompose real-world problems with design criteria and by creating user stories		define and decompose real-world problems with design criteria and by interviewing stakeholders to create user stories	
Australian Curriculum v9 – Generating and designing	design algorithms involving nested control structures and represent them using flowcharts and pseudocode		design algorithms involving logical operators and represent them as flowcharts and pseudocode	
	design a user interface for a digital system		design and prototype the user experience of a digital system	
	trace algorithms to predict output for a given input and to identify errors		validate algorithms and programs by comparing their output against a range of test cases	

	Year 7	Year 8	Year 9	Year 10
Australian Curriculum v9 – Producing and implementing	implement, modify and debug programs involving control structures and functions in a general-purpose programming language		implement, modify and debug modular programs, applying selected algorithms and data structures, including in an object-oriented programming language	
Proposed WA Curriculum			Define and decompose real world problems by surveying stakeholders to create user requirements	Define and decompose real-world problems by using data gathering techniques to create user requirements
			Design and prototype the user experience of a digital system	Design and prototype the user experience of a digital system based on client needs
	Design algorithms involving control structures (iteration and selection), and represent them using flowcharts and pseudocode	Design algorithms involving nested control structures and represent them using flowcharts and pseudocode	Design algorithms that use functions and represent them as flowcharts and/or pseudocode	Design modular algorithms involving functions and logical operators (AND, OR, NOT) and represent them as flowcharts and/or pseudocode
		Trace algorithms to predict output for a given input and to identify and fix errors	Predict the output of an algorithm using a given range of test cases and compare against actual output	Validate algorithms and programs by comparing their output against a range of test cases
	Implement, modify, and debug programs involving control structures	Implement, modify and debug programs involving control structures in a general-purpose programming language	Implement and modify programs that use functions in a general-purpose programming language	Implement, modify and debug modular programs, applying algorithms and data structures in a general-purpose programming language

Creating solutions

Investigating and defining

	Year 7	Year 8	Year 9	Year 10
Current WA Curriculum	Define and break down a given task, identifying the purpose	Investigate a given need or opportunity for a specific purpose	Identify and define the needs of a stakeholder, to create a design brief, for a solution	Identify the needs of the client/stakeholder to determine the basis for a solution
	Consider components/resources to develop solutions, identifying constraints	Evaluate and apply a given design brief	Investigate a selection of components/resources to develop solution ideas, identifying and considering constraints	Create and critique design briefs to solutions
		Consider components/resources to develop solutions, identifying constraints		Investigate components/resources to develop increasingly sophisticated solutions, identifying and considering associated constraints
Proposed WA Curriculum	Investigate and define the problem and requirements of a given design brief	Investigate a problem for a given need or opportunity	Ideate a problem and define the needs of an end user, through interviews and/or surveys	Ideate a problem and define the needs of the client/stakeholder through anecdotal evidence and/or data gathering techniques
	Break down a given design brief, identifying and defining the purpose and competing considerations	Develop a design brief for a given need or opportunity	Develop a design brief for a solution based on end user needs	Develop a design brief for a solution or to innovate an existing product, service or environment
	Consider given technologies, resources and/or components to develop solutions	Consider technologies, resources and/or components to develop solutions, identifying constraints	Investigate a range of technologies, resources and/or components to develop ideas and solutions, with consideration of constraints	Investigate a range of technologies, resources and/or components to develop ideas and solutions, with consideration of competing constraints

Designing

	Year 7	Year 8	Year 9	Year 10
Current WA Curriculum	Design, develop, review and communicate design ideas, plans and processes within a given context, using a range of techniques, appropriate technical terms and technology	Design, develop, evaluate and communicate alternative solutions, using appropriate technical terms and technology	Apply design thinking, creativity and enterprise skills	Apply design thinking, creativity, enterprise skills and innovation to develop, modify and communicate design ideas of increasing sophistication
	Follow a plan designed to solve a problem, using a sequence of steps	Produce a plan designed to solve a problem, using a sequence of steps	Design solutions assessing alternative designs against given criteria, including usability and aesthetics using appropriate technical terms and technology	Design possible solutions, analysing designs against criteria, including functionality, accessibility, usability and aesthetics, using appropriate technical terms and technology
Proposed WA Curriculum	Design processes and solutions with given technologies and techniques, using appropriate technical terms	Design processes and solutions using a range of technologies, techniques, and appropriate technical terms	Design alternative solutions with consideration of available technologies, usability, aesthetics and appropriate technical terms	Design alternative solutions with consideration of available technologies, functionality, accessibility, usability, aesthetics and appropriate technical terms

Producing and implementing

	Year 7	Year 8	Year 9	Year 10
Current WA Curriculum	Safely make designed solutions using a range of components, equipment and techniques	Safely apply appropriate techniques to make designed solutions using a range of components and equipment	Select, and safely implement and test appropriate technologies and processes, to make solutions	Select, justify, and safely implement and test appropriate technologies and processes, to make solutions
Proposed WA Curriculum	Implement agreed protocols when using a range of technologies, components and/or equipment to produce designed solutions	Implement agreed protocols, a range of technologies, techniques, components and processes to produce designed solutions	Select, implement and test a range of technologies, techniques, and processes, to produce designed solutions and/or prototypes	Select, justify, implement and test a range of technologies, techniques, and processes, to produce solutions and/or prototypes

Evaluating

	Year 7	Year 8	Year 9	Year 10
Current WA Curriculum	Independently apply given contextual criteria to evaluate design processes and solutions	Develop contextual criteria independently to assess design processes and solutions	Evaluate design processes and solutions against student-developed criteria	Analyse design processes and solutions against student-developed criteria
Proposed WA Curriculum	Use a given contextual criteria to evaluate design processes and solutions	Use student-developed contextual criteria to assess design processes and solutions	Evaluate design processes and solutions against student-developed criteria including social and ethical considerations	Evaluate design processes and solutions against student-developed criteria including social and ethical factors, and legal responsibilities

Collaborating and managing

	Year 7	Year 8	Year 9	Year 10
Current WA Curriculum	Work independently, and collaboratively when required, to plan, develop and communicate ideas and information, using management processes	Work independently, and collaboratively when required, to plan, develop and communicate ideas and information when managing projects	Work independently, and collaboratively to manage projects, using digital technology and an iterative and collaborative approach. Considers time, cost, risk and safety	Work independently, and collaboratively to manage projects, using digital technology and an iterative and collaborative approach. Considers time, cost, risk, safety, production processes, sustainability and legal responsibilities
Proposed WA Curriculum	Plan, develop and communicate, using project management processes, considering time and available resources to achieve solutions	Plan, develop and communicate, using project management processes, considering time, resources and costs to achieve solutions	Manage projects, using suitable technologies, with an agile and collaborative approach. Use project management processes to consider time, risk, economic and sustainable factors	Manage projects, using suitable technologies, with an agile and collaborative approach. Use project management processes to consider time, production processes, social, ethical, economic and sustainable factors, and legal responsibilities