

MARTY EDU – CURRICULUM GRID

CURRICULUM FOR EXCELLENCE – TECHNOLOGIES BENCHMARK GUIDE

● = Fully addresses the Benchmark ○ = Partially addresses the benchmark

Curriculum Organiser		Learning Level	Experience and Outcome	Lesson 1.1	Lesson 1.2	Lesson 1.3	Lesson 1.4
Digital Literacy	Using digital products and services in a variety of contexts to achieve a purposeful outcome	Early	TCH 0-01a		●	●	●
		First	TCH 1-01a			●	○
		Second	TCH 2-01a			○	
		Third	TCH 3-01a				
		Forth	TCH 4-01a				
	Searching, processing and managing information responsibly	Early	TCH 0-02a				
		First	TCH 1-02a				
		Second	TCH 2-02a				
		Third	TCH 3-02a				
		Forth	TCH 4-02a				
	Cyber resilience and internet safety	Early	TCH 0-03a				
		First	TCH 1-03a				
		Second	TCH 2-03a				

		Third	TCH 3-03a				
Technological Developments in Society and Business	Awareness of technological developments (Past, Present and Future), including how they work.	Early	TCH 0-05a	●	○	●	●
		First	TCH 1-05a			○	
		Second	TCH 2-05a				
		Third	TCH 3-05a		●		
		Forth	TCH 4-05a				
	Impact, contribution, and relationship of technologies on business, the economy, politics, and the environment.	First	TCH 1-07a	○			
		Second	TCH 2-06a				
		Second	TCH 2-07a				
		Third	TCH 3-08a				
		Forth	TCH 4-08a				
Craft, Design, Engineering and Graphics	Design and construct models/product	Early	TCH 0-09a	●			
		First	TCH 1-09a				
		Second	TCH 2-09a				
		Third	TCH 3-09a				
		Forth	TCH 4-09a				
	Exploring uses of materials	Early	TCH 0-10a	○			
		First	TCH 1-10a				

		Second	TCH 2-10a				
		Third	TCH 3-10a				
		Forth	TCH 4-10a				
	Representing ideas, concepts and products through a variety of graphic media	Early	TCH 0-11a		●		●
		First	TCH 1-11a		●		
		Second	TCH 2-11a				
		Third	TCH 3-11a				
		Forth	TCH 4-11a				
	Application of Engineering	Early	TCH 0-12a	●	●	●	
		First	TCH 1-12a				
		Second	TCH 2-12a				
		Third	TCH 3-12a				
		Forth	TCH 4-12a				
	Computing Science	Understanding the world through computational thinking	Early	TCH 0-13a	●	●	●
First			TCH 1-13a		○	○	○
Second			TCH 2-13a			●	●
Third			TCH 3-13a			○	
Third			TCH 3-13b				○

		Forth	TCH 4-13a				
		Forth	TCH 4-13b			○	
	Understanding and analysing computing technology	Early	TCH 0-14a	○	●	●	●
		Early	TCH 0-14b		●	○	●
		First	TCH 1-14a		●	●	●
		First	TCH 1-14b		○	○	
		Second	TCH 2-14a		○		○
		Second	TCH 2-14b				
		Third	TCH 3-14a				
		Third	TCH 3-14b				
		Forth	TCH 4-14a				
		Forth	TCH 4-14b				
		Forth	TCH 4-14c				
		Designing, building and testing computing solutions	Early	TCH 0-15a		○	●
	First		TCH 1-15a			●	●
	Second		TCH 2-15a			○	●
	Third		TCH 3-15a				
	Forth		TCH 4-15a				

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NATIONAL CURRICULUM – COMPUTING, DESIGN & TECHNOLOGY

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Curriculum Organiser			Lesson 1.1	Lesson 1.2	Lesson 1.3	Lesson 1.4
	ID	Descriptor				
Computing	1-a	Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions		○	●	●
	1-b	Create and debug simple programs		●	●	●
	1-c	Use logical reasoning to predict the behaviour of simple programs		●	●	●
	1-d	Use technology purposefully to create, organise, store, manipulate and retrieve digital content				
	1-e	Recognise common uses of information technology beyond school	○	○	○	
	1-f	Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies				
	2-a	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts		●	○	●

	2-b	Use sequence, selection, and repetition in programs; work with variables and various forms of input and output			●	○
	2-c	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs		○		●
	2-d	Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration				
	2-e	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content				
	2-f	Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information				
	2-g	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact				
	3-a	Design, use and evaluate computational abstractions that model the state and behaviour or real-world problems and physical systems			○	○
	3-b	Understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem		○		
	3-c	Use two or more programming languages, at least one of them is textual, to solve a variety of computational problems; make use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions				
	3-d	Understand simple Boolean logic [for example, AND, OR and NOT] and some of its use in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on				

		binary numbers [for example, binary addition, and conversion between binary and decimal]				
	3-e	Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems				
	3-f	Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits				
	3-g	Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goal, including collecting and analysing data and meeting the needs of known users				
	3-h	Create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability				
	3-i	Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identify and privacy; recognise inappropriate content, contact and conduct and know how to report concerns				
	4-a	Develop their capacity, creativity and knowledge in computer science, digital media and information technology				
	4-b	Develop and apply their analytic, problem-solving, design, and computational thinking skills				
	4-c	Understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns				

Design & Technology	1.1-a	Design purposeful, functional, appealing products for themselves and other users based on design criteria		●	○	●
	1.1-b	Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology	●	●		
	1.2-a	Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]	●			
	1.2-b	Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics				
	1.3-a	Explore and evaluate a range of existing products	○		○	●
	1.3-b	Evaluate their ideas and products against design criteria		●		
	1.4-a	Build structures, exploring how they can be made stronger, stiffer and more stable				
	1.4-b	Explore and use mechanisms [for example, levers, sliders, wheels and axles] in their products				
	2.1-a	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups				
	2.1-b	Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design				

	2.2-a	Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately				
	2.2-b	Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities				
	2.3-a	Investigate and analyse a range of existing products				
	2.3-b	Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work				
	2.3-c	Understand how key events and individuals in design and technology have helped shape the world			○	
	2.4-a	Apply their understanding of how to strengthen, stiffen and reinforce more complex structures				
	2.4-b	Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]				
	2.4-c	Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]				
	2.4-d	Apply their understanding of computing to program, monitor and control their products				
	3.1-a	Use research and exploration, such as the study of different cultures, to identify and understand user needs				
	3.1-b	Identify and solve their own design problems and understand how to reformulate problems given to them				
	3.1-c	Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations				

	3.1-d	Use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses				
	3.1-e	Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools				
	3.2-a	Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture				
	3.2-b	Select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties				
	3.3-a	Analyse the work of past and present professionals and others to develop and broaden their understanding				
	3.3-b	Investigate new and emerging technologies				
	3.3-c	Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups				
	3.3-d	Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists				
	3.4-a	Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions				
	3.4-b	Understand how more advanced mechanical systems used in their products enable changes in movement and force				
	3.4-c	Understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]				

	3.4-o	Apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers]				
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MARTY EDU – CURRICULUM GRID

AUSTRALIAN F-10 CURRICULUM – DIGITAL TECHNOLOGIES, DESIGN & TECHNOLOGIES

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Curriculum Organiser			Lesson 1.1	Lesson 1.2	Lesson 1.3	Lesson 1.4
	ID	Descriptor				
Digital Technologies	ACTDIK001	Recognise and explore digital systems (hardware and software components) for a purpose	●	●	●	●
	ACTDIK002	Recognise and explore patterns in data and represent data as pictures, symbols and diagrams	●	●	●	●
	ACTDIP003	Collect, explore and sort data, and use digital systems to present the data creatively			○	○
	ACTDIP004	Follow, describe and represent a sequence of steps and decisions (algorithms) needed to solve simple problems	●	●	●	●
	ACTDIP005	Explore how people safely use common information systems to meet information, communication and recreation needs				
	ACTDIP006	Create and organise ideas and information using information systems independently and with others, and share these with known people in safe online environments				
	ACTDIK007	Identify and explore a range of digital systems with peripheral devices for different purposes, and transmit different types of data				
	ACTDIK008	Recognise different types of data and explore how the same data can be represented in different ways			○	○

ACTDIP009	Collect, access and present different types of data using simple software to create information and solve problems			○	○
ACTDIP010	Define simple problems, and describe and follow a sequence of steps and decisions (algorithms) needed to solve them	○	●	●	●
ACTDIP011	Implement simple digital solutions as visual programs with algorithms involving branching (decisions) and user input			○	○
ACTDIP012	Explain how student solutions and existing information systems meet common personal, school or community needs	●			●
ACTDIP013	Plan, create and communicate ideas and information independently and with others, applying agreed ethical and social protocols		●	●	●
ACTDIK014	Examine the main components of common digital systems and how they may connect together to form networks to transmit data				
ACTDIK015	Examine how whole numbers are used to represent all data in digital systems				
ACTDIP016	Acquire, store and validate different types of data, and use a range of software to interpret and visualise data to create information				
ACTDIP017	Define problems in terms of data and functional requirements drawing on previously solved problems				
ACTDIP018	Design a user interface for a digital system				
ACTDIP019	Design, modify and follow simple algorithms involving sequences of steps, branching, and iteration (repetition)			○	○
ACTDIP020	Implement digital solutions as simple visual programs involving branching, iteration (repetition), and user input			○	○
ACTDIP021	Explain how student solutions and existing information systems are sustainable and meet current and future local community needs				

ACTDIP022	Plan, create and communicate ideas and information, including collaboratively online, applying agreed ethical, social and technical protocols				
ACTDIK023	Investigate how data is transmitted and secured in wired, wireless and mobile networks, and how the specifications affect performance				
ACTDIK024	Investigate how digital systems represent text, image and audio data in binary				
ACTDIP025	Acquire data from a range of sources and evaluate authenticity, accuracy and timeliness				
ACTDIP026	Analyse and visualise data using a range of software to create information, and use structured data to model objects or events				
ACTDIP027	Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints	○		○	○
ACTDIP028	Design the user experience of a digital system, generating, evaluating and communicating alternative designs				○
ACTDIP029	Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors			○	○
ACTDIP030	Implement and modify programs with user interfaces involving branching, iteration and functions in a general-purpose programming language				○
ACTDIP031	Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability				○
ACTDIP032	Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account				
ACTDIK033	Investigate the role of hardware and software in managing, controlling and securing the movement of and access to data in networked digital systems				
ACTDIK035	Analyse simple compression of data and how content data are separated from presentation				

	ACTDIP036	Develop techniques for acquiring, storing and validating quantitative and qualitative data from a range of sources, considering privacy and security requirements				
	ACTDIP037	Analyse and visualise data to create information and address complex problems, and model processes, entities and their relationships using structured data				
	ACTDIP038	Define and decompose real-world problems precisely, taking into account functional and non-functional requirements and including interviewing stakeholders to identify needs				
	ACTDIP039	Design the user experience of a digital system by evaluating alternative designs against criteria including functionality, accessibility, usability, and aesthetics				○
	ACTDIP040	Design algorithms represented diagrammatically and in structured English and validate algorithms and programs through tracing and test cases				
	ACTDIP041	Implement modular programs, applying selected algorithms and data structures including using an object-oriented programming language				
	ACTDIP042	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				
	ACTDIP043	Create interactive solutions for sharing ideas and information online, taking into account safety, social contexts and illegal responsibilities				
	ACTDIP044	Plan and manage projects using an iterative and collaborative approach, identifying risks and considering safety and sustainability				
Design and Technologies	ACTDEK001	Identify how people design and produce familiar products, services and environments and consider sustainability to meet personal and local community needs	●	○	○	○
	ACTDEK002	Explore how technologies use forces to create movement in products				○
	ACTDEK004	Explore the characteristics and properties of materials and components that are used to produce design solutions			○	○

ACTDEP005	Explore needs or opportunities for designing, and the technologies needed to realise designed solutions		○		○
ACTDEP006	Generate, develop and record design ideas through describing, drawing and modelling	●	●	●	●
ACTDEP007	Use materials, components, tools, equipment and techniques to safely make designed solutions				
ACTDEP008	Use personal preferences to evaluate the success of design ideas, processes and solutions including their care for environment				
ACTDEP009	Sequence steps for making designed solutions and working collaboratively	●	●	●	●
ACTDEK010	Recognise the role of people in design and technologies occupations and explore factors, including sustainability that impact on the design of products, services and environments to meet community needs				
ACTDEK011	Investigate how forces and the properties of materials affect the behaviour of a product or system				
ACTDEK013	Investigate the suitability of materials, systems, components, tools and equipment for a range of purposes				
ACTDEP014	Critique needs or opportunities for designing and explore and test a variety of materials, components, tools and equipment and the techniques needed to produce designed solutions				
ACTDEP015	Generate, develop, and communicate design ideas and decisions using appropriate technical terms and graphical representation techniques				
ACTDEP016	Select and use materials, components, tools, equipment and techniques and use safe work practices to make designed solutions				
ACTDEP017	Evaluate design ideas, processes and solutions based on criteria for success developed with guidance and including care for the environment				
ACTDEP018	Plan a sequence of production steps when making designed solutions individually and collaboratively				

ACTDEK019	Examine how people in design and technologies occupations address competing considerations, including sustainability in the design of products, services, and environments for current and future use				
ACTDEK020	Investigate how electrical energy can control movement, sound or light in a designed product or system				
ACTDEK023	Investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use				
ACTDEP024	Critique needs or opportunities for designing, and investigate materials, components, tools, equipment and processes to achieve intended design solutions				
ACTDEP025	Generate, develop and communicate design ideas and processes for audiences using appropriate technical terms and graphical representation techniques				
ACTDEP026	Select appropriate materials, components, tools, equipment and techniques and apply safe procedures to make designed solutions				
ACTDEP027	Negotiate criteria for success that include sustainability to evaluate design ideas, processes and solutions				
ACTDEP028	Develop project plans that include consideration of resources when making designed solutions individually and collaboratively				
ACTDEK029	Investigate the ways in which products, services and environments evolve locally, regionally and globally and how competing factors including social, ethical and sustainability considerations are prioritised in the development of technologies and designed solutions for preferred futures				
ACTDEK031	Analyse how motion, force and energy are used to manipulate and control electromechanical systems when designing simple, engineered solutions				
ACTDEK034	Analyse ways to produce designed solutions through selecting and combining characteristics and properties of materials, systems, components, tools and equipment				

ACTDEP035	Critique needs or opportunities for designing and investigate, analyse and select from a range of materials, components, tools, equipment and processes to develop design ideas				
ACTDEP036	Generate, develop, test and communicate design ideas, plans and processes for various audiences using appropriate technical terms and technologies including graphical representation techniques				
ACTDEP037	Select and justify choices of materials, components, tools, equipment and techniques to effectively and safely make designed solutions				
ACTDEP038	Independently develop criteria for success to evaluate design ideas, processes and solutions and their sustainability				
ACTDEP039	Use project management processes when working individually and collaboratively to coordinate production of designed solutions				
ACTDEK040	Critically analyse factors, including social, ethical and sustainability considerations, that impact on designed solutions for global preferred futures and the complex design and production processes involves				
ACTDEK041	Explain how products, services and environments evolve with consideration of preferred futures and the impact of emerging technologies on design decisions				
ACTDEK043	Investigate and make judgements on how the characteristics and properties of materials are combined with force, motion and energy to create engineering solutions				
ACTDEK046	Investigate and make judgements on how the characteristics and properties of materials, systems, components, tools and equipment can be combined to create designed solutions				
ACTDEK047	Investigate and make judgements, within a range of technologies specialisations, on how technologies can be combined to create designed solutions				
ACTDEP048	Critique needs or opportunities to develop design briefs and investigate and select an increasingly sophisticated range of materials, systems, components, tools and equipment to develop design ideas				

	ACTDEP049	Develop, modify and communicate design ideas by applying design thinking, creativity, innovation and enterprise skills of increasing sophistication				
	ACTDEP050	Work flexibly to effectively and safely test, select, justify and use appropriate technologies and processes to make designed solutions				
	ACTDEP051	Evaluate design ideas, processes and solutions against comprehensive criteria for success recognising the need for sustainability				
	ACTDEP052	Develop project plans using digital technologies to plan and manage projects individually and collaboratively taking into consideration time, cost, risk and production processes				