Victorian Curriculum - Technologies: Digital Technologies - Strands with Sub-strands

PROGRESSION IS HIGHLIGHTED IN THE FOLLOWING DOCUMENT VIA **BOLDED TEXT**.

Bands/Level Indicators	BAND DESCRIPTIONS	Digital Systems	Data and Information	Creating Digital Solutions	
		Content Descriptor	Content Descriptor	Content Descriptor	Content Descriptor
Foundation to Year 2	**Foundation to Year 2** In Foundation to Level 2, students are introduced to common digital systems and patterns that exist within data they collect. Students organise, manipulate and present this data, including numerical, categorical, text, image, audio and video data, in creative ways to create meaning. Students use the concept of abstraction when defining problems, to identify the most important information. They begin to develop their design thinking skills by conceptualising algorithms as a sequence of steps for carrying out instructions, such as identifying steps in a process or controlling robotic devices. Students describe how information systems meet information, communication and recreation needs. Through discussion with teachers, students learn to apply safe practices to protect themselves and others as they interact online for learning and communicating. Across the band, students will have had the opportunity to create a range of digital solutions through guided play and integrated learning, such as using robotic toys to navigate a map or recording science data with software applications.	Identify and explore digital systems (hardware and software components) for a purpose (VCDTDS013)	Recognise and explore patterns in data and represent data as pictures, symbols and diagrams (VCDTDI014) Collect, explore and sort data, and use digital systems to present the data creatively (VCDTDI015) Independently and with others create and organise ideas and information using information systems, and share these with known people in safe online environments (VCDTDI016)	Follow, describe and represent a sequence of steps and decisions (algorithms) needed to solve simple problems (VCDTCD017)	Explore how people safely use common information systems to meet information, communication and recreation needs (VCDTCD018)
Foundation to Year 2 Achievement Standard	NOTE: The standards are not divided into Strands or Sub-strands in the Victorian Curriculum documents. However, logic would dictate that the standards could be put into sub-strands, as demonstrated to the right.	By the end of Year 2, students identify **how** common digital systems are used to meet **specific** purposes.	Students use digital systems to represent simple patterns in data in different ways and and collect **familiar** data and display them **to convey meaning**.	Students **design** solutions to simple problems using a sequence of steps and decisions.	They create and organise ideas and information using information systems and share information in safe online environments

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Levels 3 and 4	In Year 3 and 4, students **explore** digital systems **in terms of their components, and peripheral devices such as digital microscopes, cameras and interactive whiteboards**. They collect, manipulate and **interpret** data, **developing an understanding of the characteristics of data and their representation**. Students further develop their computational thinking skills using the concept of abstraction to analyse simple problems, **use techniques such as summarising facts to deduce conclusions**. They **record simple solutions to problems through text and diagrams and develop their designing skills. They initially follow prepared** algorithms **to describe their own that support branching (choice of options) and user input. Their solutions are implemented using appropriate software including visual programming languages that use graphical elements rather than text instructions**. **With teacher guidance, students identify and list the major** steps **needed to complete a task or project. When sharing ideas and communicating in online environments they develop an understanding of why it is important to consider the feelings of their audiences** and apply safe practices and **agreed social protocols that demonstrate respectful behaviour**. Across the band, students will have had opportunities to create a range of digital solutions, **such as interactive adventures that involve user choice, modelling simplified real-world systems and simple guessing games**.	Explore and use **a range of** digital systems **with peripheral devices for different purposes, and transmit different types of data** (VCDTDS019)	Recognise **different types of** data and explore **how the same data can be represented in different ways** (VCDTDI020) Collect, **access** and present **different types of** data **using simple software to create information and solve problems** (VCDTDI021) Individually and with others, **plan**, create and **communicate**ideas and information **safely, applying** agreed **ethical** and social protocols (VCDTDI022)	**Define simple problems, and describe** and follow a sequence of steps and decisions involving branching and user input (algorithms) needed to solve them (VCDTCD023)	**Explain how student-developed solutions and existing information systems meet common personal, school or community** needs (VCDTCD025)	**Develop simple solutions as visual programs** (VCDTCD024)
Levels 3 and 4 Achievement Standard	NOTE: The standards are not divided into Strands or Sub-strands in the Victorian Curriculum documents. However, logic would dictate that the standards could be put into sub-strands, as demonstrated to the right.	By the end of Level 4, students **describe how** a range of digital systems and their peripheral devices can be used for different purposes.	Students **explain** how the same data sets can be represented in different ways. They collect and **manipulate** different data when creating information and digital solutions.	Students define simple problems, **design and implement digital solutions using** algorithms that involve decision-making and **user input**.	They plan and safely use information systems when creating and communicating ideas and information, applying agreed protocols.	They explain how their developed solutions and existing information systems meet **their purposes**.

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Levels 5 and 6	In Year 5 and 6, students develop an understanding of **the role individual** components of digital systems **play in the processing and representation of** data. They **acquire, validate, interpret, track and manage various types of** data and **are introduced to the concept of data states in digital systems and how data are transferred between systems**. They learn to **develop** abstractions **further by identifying common elements across similar problems and systems and develop an understanding of the relationship between models and the real-world systems they represent**. When creating solutions, students analyse problems **clearly by defining appropriate data and requirements**. When **designing, they consider how users will interact with the solutions, and check and validate their designs to increase the likelihood of creating working solutions**. Students **increase the sophistication of their** algorithms **by identifying repetition and incorporate repeat instructions or structures when developing their solutions through visual programming, such as reading user input until an answer is guessed correctly in a quiz**. They **evaluate their solutions and examine the sustainability of their own and existing information systems**. Students **progress from managing the creation of their own ideas and information for sharing to working collaboratively. In doing so, they learn to negotiate and develop plans to complete tasks. When engaging with others, they take personal and physical** safety **into account**, applying social and **ethical** protocols **that acknowledge factors such as social differences and privacy of personal information**. They **also develop their skills in applying technical protocols such as devising file naming conventions that are meaningful and determining safe storage locations to protect data and information**. Across the band, students will have had opportunities to create a range of digital solutions, such as games **or quizzes and** interactive **stories and animations**.	**Examine the main components of common digital systems, and how such digital systems may connect together to form networks** to transmit data (VCDTDS026)	Examine how **whole numbers are used as the basis for representing all types of** data in digital systems (VCDTDI027) **Acquire, store and validate** different types of data and **use a range of** software to **interpret and visualise data** to create information (VCDTDI028) Plan, create and communicate ideas, information and **online collaborative projects**, applying agreed ethical, social and **technical** protocols (VCDTDI029)	Define problems **in terms of data and functional requirements, drawing on previously solved problems to identify similarities** (VCDTCD030)	Explain how student-developed solutions and existing information systems meet current and future community needs and **sustainability needs** (VCDTCD034)	Develop digital solutions as simple visual programs (VCDTCD033)	Design **a user interface for a digital system, generating and considering alternative designs** (VCDTCD031)	Design, **modify** and follow simple algorithms **represented diagrammatically and in English** involving sequences of steps, **branching, and iteration** (VCDTCD032)
Levels 5 and 6 Achievement Standard	NOTE: The standards are not divided into Strands or Sub-strands in the Victorian Curriculum documents. However, logic would dictate that the standards could be put into sub-strands, as demonstrated to the right.	By the end of Year 6, students **explain the functions** of digital system components and how digital systems **are** connected to form networks that transmit data.	Students **explain** how digital systems use whole numbers as a basis for representing **a variety of** data types. They manage the creation and communication of ideas, information and digital projects colaboratively using validated data and agreed protocols.	Students define problems in terms of data and functional requirements and design solutions by **developing** algorithms **to address the problems**.	Students explain how information systems and their developed solutions meet current and future needs and taking sustainability into **account**.	They **incorporate** decision-making, repetition and **user interface** design into their designs and implement their digital solutions, including a visual program.		

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Levels 7 and 8	In Levels 7 and 8, students analyse **the properties of networked systems and their suitability and use for the transmission of data types**. They acquire, **analyse**, validate and **evaluate** various types of data, and **appreciate the complexities of storing** and **transmitting that data** in digital systems. Students use **structured data to model objects and events that shape the communities they actively engage with**. They further develop their understanding of **the vital role that data plays in their lives, and how the data and related systems define and are limited by technical and sustainability (environmental, economic and social) constraints**. Students develop abstractions further by identifying common elements **while decomposing apparently different** problems and **systems** to define **requirements, and recognise that abstractions hide irrelevant details for particular purposes**. When analysing problems, students **identify the key elements of the problems and the factors and constraints at play**. They **design** increasingly **complex** algorithms **that allow data to be manipulated automatically, and explore different ways of showing the relationship between data elements to help computation, such as using pivot tables, graphs and clearly defined mark-up or rules**. They progress from designing the user interface **to considering user experience factors such as user expertise, accessibility and usability requirements**. They **broaden** their programming experiences **to include general-purpose programming languages, and incorporate subprograms** into their solutions. They **predict and evaluate their developed and existing** solutions, **considering time, tasks, data** and the safe and sustainable use of information systems, **and anticipate any risks associated with the use or adoption of** such systems. Students plan and manage individual and team projects **with some autonomy**. They consider **ways of managing the exchange of ideas, tasks and files, and techniques for monitoring progress and feedback**. When communicating and collaborating online, students develop an understanding of different social contexts, for example **acknowledging cultural practices and meeting legal obligations**. Across the band, students will have had opportunities to create a range of digital solutions, such as interactive **web applications or programmable multimedia assets or simulations of relationships between objects in the real world**.	Investigate how **data are transmitted and secured in wired, wireless and mobile networks** (VCDTDS035)	Investigate how digital systems **represent text, image and audio data in binary** (VCDTDI036) Acquire data **from a range of sources** and **evaluate thier authenticity, accuracy and timeliness** (VCDTDI037) Analyse and visualise data using a range of software to create information, and use **structured data to model objects or events** (VCDTDI038) **Manage**, create and communicate interactive ideas, information and projects collaboratively online, **taking safety and social contexts into account** (VCDTDI039)	Define and **decompose real-world problems taking into account functional requirements** and sustainability (**economic**, environmental, social), technical and **usability constraints** (VCDTCD040)	Evaluate **how well** student-developed solutions and existing information systems meet needs, **are innovative** and **take account of future risks** and sustainability (VCDTCD044)		**Develop and modify programs with** user interfaces involving branching, iteration **and functions in a general-purpose programming language** (VCDTCD043) Design the user **experience** of a digital system, generating, **evaluating and communicating** alternative designs (VCDTCD041)	Design algorithms represented diagrammatically and in English, and **trace algorithms to predict output for a given input and to identify errors** (VCDTCD042)
Levels 7 and 8 Achievement Standard	NOTE: The standards are not divided into Strands or Sub-strands in the Victorian Curriculum documents. However, logic would dictate that the standards could be put into sub-strands, as demonstrated to the right.	By the end of Level 8, students **distinguish between** different types of networks and their suitability in meeting **defined** purposes. Students **explain how** text, image and sound data can be represented, **secured** in digital systems and **presented** using digital systems.	They manage the collaborative creation of interactive ideas, information and projects and **use appropriate codes of conduct when communicating** online.	Students define and decompose problems **in terms of** functional requirements and constraints.	Students evaluate information systems and their solutions in terms of meeting needs, innovation and sustainability.	They analyse and evaluate data from a range of sources to model and create information.		They design user experiences and algorithms incorporating branching and iterations, and develop, **test** and modify digital solutions.