Digital Technologies, Foundation to Level 10 – Unit plan ideas

The VCAA has developed the following resource for Digital Technologies. The resource includes unit plans that cover one strand and its associated content descriptions from Foundation to Level 10. The unit plans include ideas for learning activities and assessment activities that could be completed by students at home, if they are working remotely, or by students working in the classroom.

This resource has been developed to assist teachers with ideas for planning and delivering a series of lessons that meet the content descriptions and then assessing student work against the relevant achievement standard. The unit plans are grouped by band: F–2, 3–4, 5–6, 7–8 and 9–10. Each unit plan covers one strand: Digital Systems, Data and Information, or Creating Digital Solutions. Relevant extracts from the achievement standard have been provided.

Each of the unit plans includes a sample timeline and ideas for lesson activities and assessment activities. Each unit plan also contains a link to the relevant VCAA curriculum area plan resource, for teachers who want to develop units of work based on these resources.

The ideas in these unit plans involve students identifying and exploring hardware, software and network components, transmission media and network security; drawing diagrams; listing items and writing descriptions; recording their voice; conducting surveys; using spreadsheets; collaborating online; using computational and design thinking involving problem solving to determine requirements; interviewing stakeholders; generating designs and evaluation criteria; designing algorithms; developing programs; and evaluating solutions.

Teachers would need to prepare students before delivering a unit of work based on these unit plans. They could use a range of teaching and learning activities (see the Plugged activities and Unplugged activities on the Digital Technologies [Curriculum advice for remote and flexible learning page](https://www.vcaa.vic.edu.au/curriculum/foundation-10/resources/digital-technologies/Pages/CurriculumAdviceforRemoteandFlexibleLearning.aspx)). They may also wish to prepare student worksheets to go with the ideas in the unit plans.

Teachers should monitor students’ completion of a unit of work and assess against the relevant achievement standard. Students could submit evidence for teachers to assess by taking photographs of their work and emailing them to the teacher; emailing completed documents or solutions to the teacher; or uploading images and documents to the school learning management system.

Digital Technologies, Foundation to Level 2 – Unit plan ideas

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| **Achievement standard extract** | |
| By the end of Level 2, students identify how common digital systems are used to meet specific purposes. | |
| **Strand and content description** | |
| **Digital Systems**  Identify and explore digital systems (hardware and software components) for a purpose [(VCDTDS013)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTDS013) | |
| **Ideas for delivery of unit** | |
| The unit may have a 1 × 60-minute lesson each week over four weeks. | |
| Week 1:  What is a computer? | * Introduce students to the components that make up a computer or digital system. * Students draw a diagram of a known digital system from memory and label as many parts as they can. |
| Week 2:  Hardware and software components | * Introduce students to the difference between hardware and software components. * Identify and explore the different hardware and software components of a digital system. * Develop a list of hardware components, software applications (apps) and operating systems. |
| Week 3:  Digital system detective | * Students look around their home or school and record the different types of digital systems they can find, for example laptops, tablet devices, desktop computers, smartphones, printers, robotic devices. * Students choose two different digital devices and complete a Venn diagram listing the similarities and differences between their chosen digital devices. Two different devices could be a laptop and a tablet device. |
| Week 4: Assessment activity | * Refer to the assessment activities below. |
| **Ideas for assessment activities** | |
| Pre-test | A simple written test on some basic terminology (including hardware and software components) |
| Written test | A written test on terminology and identifying hardware and software components |
| Worksheet | A worksheet that enables students to identify and describe a range of hardware and software components for a number of digital devices |
| Create an e-book | An e-book in which students draw and label the hardware and software components of a digital system |
| **Link to curriculum area plan** | |
| DigiTech P–2 Curriculum Area Plan Sample Program 1  [www.vcaa.vic.edu.au/curriculum/foundation-10/resources/digital-technologies/Pages/Help-me-find-a-teaching-resource.aspx](http://www.vcaa.vic.edu.au/curriculum/foundation-10/resources/digital-technologies/Pages/Help-me-find-a-teaching-resource.aspx) | |

Digital Technologies, Levels 3 and 4 – Unit plan ideas

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| **Achievement standard extracts** | |
| By the end of Level 4, …  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. They plan and safely use information systems when creating and communicating ideas and information, applying agreed protocols. | |
| **Strand and content descriptions** | |
| Data and Information  Recognise different types of data and explore how the same data can be represented in different ways [(VCDTDI020)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTDI020)  Collect, access and present different types of data using simple software to create information and solve problems [(VCDTDI021)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTDI021)  Individually and with others, plan, create and communicate ideas and information safely, applying agreed ethical and social protocols [(VCDTDI022)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTDI022) | |
| **Ideas for delivery of unit** | |
| The unit may have a 1 × 60-minute lesson each week over 13 weeks. | |
| Week 1: Investigate different types of data | * Investigate the different types of data stored in digital systems, for example numbers, text, images, video, sounds. |
| Week 2:  Explore different ways of representing data | * Explore the different ways of organising/representing data, for example tables with words and numbers, codes and charts. * Investigate how the same data can be represented in multiple ways. |
| Week 3:  Record and edit sound | * Students record their voice and then use a sound editor to view the waveform as a visual representation of sound. * Apply effects or filters to a recorded sound, listen to the changes in the sound and observe the altering waveform. |
| Week 4: Assessment activity | * Refer to the assessment activities below. |
| Week 5: Collect and record student data | * Students collect and record data from their classmates, for example student height, student eye colour, local car traffic, getting to school, rubbish-free lunches. * Conduct class surveys and record the results of the data above. |
| Week 6: Collect and record data in spreadsheets | * Enter the data collected above into a table in a spreadsheet. * Format the data, perform calculations on the data and sort the data. |
| Week 7:  Graph data and present findings | * Students present findings by creating charts from the data in the table above. * Use a range of charts, such as bar charts and pie charts, and label the charts. |
| Week 8: Assessment activity | * Refer to the assessment activities below. |
| Week 9: Explore collaboration | * Explore a note-taking platform and mind-mapping software, particularly those allowing multiple users to collaborate on the same document. |
| Week 10:  Share ideas | * Investigate and discuss how multiple users can share ideas, and how to respectfully disagree with someone else’s suggestions. |
| Week 11: Develop protocols | * Explore and develop protocols on how to collaborate by sharing ideas and information in a document, including what is appropriate to share online. |
| Week 12:  Fair use and copyright | * Students find and use appropriately licensed digital resources, such as Creative Commons materials. These resources may be pictures that represent data categories collected in earlier weeks. Students reference these pictures to avoid copyright or plagiarism issues. |
| Week 13: Assessment activity | * Refer to the assessment activities below. |
| **Ideas for assessment activities** | |
| Pre-test | * A simple written test on terminology and concepts from the Foundation to Level 2 Data and Information strand |
| Week 4: Recognise data types | * A written report in which students visually represent a dataset in two or three different ways * A printout of a waveform of the student’s voice with annotations showing volume changes and breakdown of words |
| Week 8:  Create information and solve problems | * A short presentation of the findings from a task or activity, including charts * A poster or infographic about the key findings of a task or activity * A spreadsheet solution including formatted data in a table with charts and annotations |
| Week 13:  Create and communicate ideas | * An interactive display about online safety for students * A set of class or year-level guidelines for fair use when using content found online * An FAQ (frequently asked questions) document about online collaboration |
| **Link to curriculum area plan** | |
| DigiTech 3–4 Curriculum Area Plan Sample Program 2  [www.vcaa.vic.edu.au/curriculum/foundation-10/resources/digital-technologies/Pages/Help-me-find-a-teaching-resource.aspx](http://www.vcaa.vic.edu.au/curriculum/foundation-10/resources/digital-technologies/Pages/Help-me-find-a-teaching-resource.aspx) | |

Digital Technologies, Levels 5 and 6 – Unit plan ideas

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| **Achievement standard extracts** | |
| By the end of Level 6, …  Students define problems in terms of data and functional requirements and design solutions by developing algorithms to address the problems. They incorporate decision-making, repetition and user interface design into their designs and develop their digital solutions, including a visual program. Students explain how information systems and their developed solutions meet current and future needs taking sustainability into account. | |
| **Strand and content descriptions** | |
| **Creating Digital Solutions**  Define problems in terms of data and functional requirements, drawing on previously solved problems to identify similarities [(VCDTCD030)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTCD030)  Design a user interface for a digital system, generating and considering alternative design ideas [(VCDTCD031)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTCD031)  Design, modify and follow simple algorithms represented diagrammatically and in English, involving sequences of steps, branching, and iteration [(VCDTCD032)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTCD032)  Develop digital solutions as simple visual programs [(VCDTCD033)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTCD033)  Explain how student-developed solutions and existing information systems meet current and future community and sustainability needs [(VCDTCD034)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTCD034) | |
| **Ideas for delivery of unit** | |
| The unit may have a 1 × 60-minute lesson each week over 15 weeks. | |
| Weeks 1 and 2: Define a problem | * Students learn how to analyse a problem in order to develop a solution. They could investigate solving a problem to meet their school community needs. * Explore the breaking down of a problem into smaller problems. * Investigate the data that is required to solve a problem. * Define the functional requirements for a solution. * Compare different problems and identify similarities. * Assessment activity (refer to the assessment activities below). |
| Weeks 3–7: Create interface and algorithms | * Generate a range of design ideas. * Design a user interface as a mock-up. * Annotate the mock-up with descriptions of appearance and functionality. * Create an algorithm as a set of English statements. * Draw basic flowcharts using appropriate symbols and follow a sequence of steps to develop a solution. * Modify the flowcharts to include branching and iteration. * Assessment activity (refer to the assessment activities below). |
| Weeks 8–13: Create code based on algorithms | * Revise the control structures of sequence and branching (selection). * Create a simple algorithm using iteration (repetition). * Create simple programs involving a sequence of steps, branching and iteration. * Develop the user interface for a solution using a simple visual program such as Scratch. * Develop the program for a software solution using a simple visual program such as Scratch. * Assessment activity (refer to the assessment activities below). |
| Weeks 14 and 15: Reflection | * Review the functional requirements of the simple visual program. * Identify the functional requirements that have been met and those that have not been met by using a checklist. * Modify the simple visual program. * Choose several classmates to review their simple visual program and provide them with feedback using a separate checklist. * Write about how their simple visual program meets requirements and the school community’s needs. * Modify the simple visual program. * Assessment activity (refer to the assessment activities below). |
| **Ideas for assessment activities** | |
| Pre-test | * A simple written test on terminology and concepts from the Levels 3 and 4 Creating Digital Solutions strand |
| Define a problem | * A visual diagram showing the different parts of the problem, for example a structure chart * A written report describing the data required to solve a problem * A written report with a list of functional requirements |
| Create interface and algorithms | * Visual diagrams or drawings of design ideas * Annotated mock-ups of a design for a solution * A written report that includes an algorithm as a set of English statements * A visual diagram of a flowchart |
| Create code based on algorithms | * A user interface for a simple visual program * A simple visual program including sequence, branching and iteration |
| Reflection | * A written report that includes a checklist of functional requirements * A written report that includes evidence of classmates reviewing the simple visual program * A modified simple visual program * A written report discussing how the simple visual program meets requirements and the school community’s needs |
| **Link to curriculum area plan** | |
| DigiTech 5–6 Curriculum Area Plan Sample 1  [www.vcaa.vic.edu.au/curriculum/foundation-10/resources/digital-technologies/Pages/Help-me-find-a-teaching-resource.aspx](http://www.vcaa.vic.edu.au/curriculum/foundation-10/resources/digital-technologies/Pages/Help-me-find-a-teaching-resource.aspx) | |

Digital Technologies, Levels 7 and 8 – Unit plan ideas

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| **Achievement standard extract** | |
| By the end of Level 8, students distinguish between different types of networks and their suitability in meeting defined purposes. | |
| **Strand and content description** | |
| **Digital Systems**  Investigate how data is transmitted and secured in wired, wireless and mobile networks [(VCDTDS035)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTDS035) | |
| **Ideas for delivery of unit** | |
| The unit may have 2 × 45-minute lessons each week over three weeks. | |
| Week 1: Types of network components | * Identify and describe the different types of network components for both wired and wireless networks. Network components could include servers, routers, switches, devices such as desktop computers, laptops or tablet devices, and printers. * As part of the description discuss what each component is used for and how it works. * Draw simple diagrams of each of the components using symbols. |
| Week 2: Transmission media and communications protocols | * Identify and describe a range of transmission media for wired, wireless and mobile networks. * Include the transmission rates for each of the transmission media. * Provide examples of where each of the transmission media would be used. * Identify and describe a range of different communications protocols, such as transmission control protocol/internet protocol (TCP/IP), file transfer protocol (FTP) and hypertext transfer protocol (HTTP). * Discuss what each communication protocol is used for and how it works. |
| Week 3:  Network security | * Investigate network security, including the use of usernames and passwords to log in to devices and networks, firewalls to protect networks, and the encryption of data and files. * Assessment activity (refer to the assessment activities below). |
| **Ideas for assessment activities** | |
| Pre-test | * A simple written test on terminology and concepts from the Levels 5 and 6 Digital Systems strand |
| Written test | * A written test with structured questions about networks, network components, transmission media and rates, communications protocols and network security. Students could write responses and/or draw diagrams. |
| Worksheet | * A worksheet with structured questions about networks, network components, transmission media and rates, communications protocols and network security. Students could write responses and/or draw diagrams. |
| Case study | * A case study with structured questions about networks, network components, transmission media and rates, communications protocols and network security |
| Visual diagram or network diagram | * Students draw a diagram of their home or school network using symbols to show the network components (such as servers, routers, printers, devices, transmission media) and show transmission rates. This could be hand drawn or completed using drawing software. * Students label all the components, including transmission rates for the transmission media, components involved in network security such as the firewall, and any other devices. |
| **Link to curriculum area plan** | |
| DigiTech 7–8 Curriculum Area Plan Sample Program 2  [www.vcaa.vic.edu.au/curriculum/foundation-10/resources/digital-technologies/Pages/Help-me-find-a-teaching-resource.aspx](http://www.vcaa.vic.edu.au/curriculum/foundation-10/resources/digital-technologies/Pages/Help-me-find-a-teaching-resource.aspx) | |

Digital Technologies, Levels 9 and 10 – Unit plan ideas

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| **Achievement standard extracts** | |
| By the end of Level 10, …  Students define and decompose complex problems in terms of functional and non-functional requirements. They design and evaluate user experiences and algorithms, and develop and test modular programs, including an object-oriented program. Students evaluate their solutions and information systems in terms of risk, sustainability and potential for innovation. | |
| **Strand and content descriptions** | |
| **Creating Digital Solutions**  Define and decompose real-world problems precisely, taking into account functional and non-functional requirements and including interviewing stakeholders to identify needs [(VCDTCD050)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTCD050)  Design the user experience of a digital system, evaluating alternative designs against criteria including functionality, accessibility, usability and aesthetics [(VCDTCD051)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTCD051)  Design algorithms represented diagrammatically and in structured English and validate algorithms and programs through tracing and test cases [(VCDTCD052)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTCD052)  Develop modular programs, applying selected algorithms and data structures including using an object-oriented programming language [(VCDTCD053)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTCD053)  Evaluate critically how well student-developed solutions and existing information systems and policies take account of future risks and sustainability and provide opportunities for innovation [(VCDTCD054)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDTCD054) | |
| **Ideas for delivery of unit** | |
| The unit may have 3 × 45-minute lessons each week over nine weeks. | |
| Week 1: Decompose problems | * Introduce students to breaking down complex problems into smaller problems. * Define functional and non-functional requirements in developing a solution. * Students interview stakeholders to identify their needs and the functional and non-functional requirements of the solution. * Assessment activity (refer to the assessment activities below). |
| Week 2:  Design the user experience | * Create two or more designs of user interfaces for an app or a game. * Develop evaluation criteria for selecting the best design. * Consider a wide range of users, including people with disabilities. * Assessment activity (refer to the assessment activities below). |
| Week 3:  Design algorithms | * Create simple algorithms and revise control structures. * Design algorithms that use functions and data structures. * Define the rules of Structured English (pseudocode). * Develop algorithms that incorporate basic object-oriented programming concepts, such as calling a method and using object properties. * Test the expected output of algorithms using tracing and desk checking, making modifications and recording results. * Assessment activity (refer to the assessment activities below). |
| Weeks 4–8: Develop modular programs | * Review a general-purpose programming language by creating functions with arguments that return a value. * Identify and record the objects, events and properties in favourite games or apps. * Describe how methods are used in a simple program. * Create more complex programs that use methods and object properties. * Create modules that use classes, methods and object properties. * Progressively test the functionality of the program using a testing table to check actual output versus expected output and make modifications to the module where appropriate. * Assessment activity (refer to the assessment activities below). |
| Week 9:  Evaluate student-developed solutions | * Discuss how the student-developed solution meets the functional and non-functional requirements of the stakeholder. * Investigate sustainability issues with digital solutions, such as e-waste, compatibility, energy use and redundancy. * Compare student-developed solutions with existing products and discuss potential room for innovation. * Develop evaluation criteria as a class to assess student-developed solutions that take into account user experience, original requirements and accessibility. * Assessment activity (refer to the assessment activities below). |
| **Ideas for assessment activities** | |
| Pre-test | * A simple written test on terminology and concepts from the Levels 7 and 8 Creating Digital Solutions strand |
| Decompose problems | * A written test on terminology and concepts * A written report on a game or application proposal that includes functional and non-functional requirements * A visual diagram showing the top-down design of a complex problem * A transcript of an interview with a stakeholder discussing their needs and identifying their functional and non-functional requirements |
| Design the user experience | * A written report of a specification of a software solution to be developed * A table with a list of evaluation criteria used to evaluate the completed software solution * Two or more mock-ups of the proposed user interfaces * A written report evaluating the mock-ups and a justification of the chosen mock-up to be created as a software solution |
| Design algorithms | * A written test on rules of flowcharts and Structured English * A workbook with algorithm solutions to given tasks in class * A portfolio of student-developed algorithms, including tracing and modifications |
| Develop modular programs | * A written test on terminology and concepts * A portfolio of working software solutions and testing tables for each modular program * An annotated visual report of a student’s analysis of an existing game or application * A student proposal for a developed game or application |
| Evaluate student-developed solutions | * A written test on sustainability issues with digital technologies * A written report comparing student-developed solutions with existing solutions * A written evaluation report containing an evaluation table and conclusion that assesses a student’s developed solution against the functional and non-functional requirements and the stakeholder’s needs |
| **Link to curriculum area plan** | |
| DigiTech 9–10 Curriculum Area Plan Sample Program 1  [www.vcaa.vic.edu.au/curriculum/foundation-10/resources/digital-technologies/Pages/Help-me-find-a-teaching-resource.aspx](http://www.vcaa.vic.edu.au/curriculum/foundation-10/resources/digital-technologies/Pages/Help-me-find-a-teaching-resource.aspx) | |