

TEACHERS' MANUAL for Digital Technologies Student Workbooks



Contents

| | | | |
|---|-----------|--|-----------|
| Digital Technologies: Years 1 -2 Workbook | 4 | Digital Technologies: Years 5 -6: Book 1 Workbook | 33 |
| Introduction | 5 | Introduction | 38 |
| Curriculum Links | 5-7 | Curriculum Links | 38-40 |
| Section 1: Understanding Technology and Digital Systems | 8 | Section 1: Technology - Past and Present | 41 |
| Section 2: Data Collection and Pattern Recognition | 13 | Section 2: Data Collection and Representation | 48 |
| Section 3: Problem Solving With Algorithms | 15 | Section 3: Software and Computer Applications | 51 |
| Section 4: Applications of the Internet | 17 | | |
| | | | |
| Digital Technologies: Years 3 -4 Workbook | 20 | Digital Technologies: Years 5 -6: Book 2 Workbook | 55 |
| Introduction | 21 | Introduction | 56 |
| Curriculum Links | 21-23 | Curriculum Links | 56-58 |
| Section 1: Digital Systems and Devices | 24 | Section 1: Technology - Past and Present | 59 |
| Section 2: Data On Computers | 28 | Section 2: Data Collection and Representation | 62 |
| Section 3: Problem Solving With Algorithms | 32 | Section 3: Software and Computer Applications | 68 |
| Section 4: Information Systems and Ethics | 34 | | |

Sample

To access videos and websites providing background to these books go to:

<https://www.readyed.net/digital-technologies-for-years-1-2/>

<https://www.readyed.net/digital-technologies-for-years-3-4/>

<https://www.readyed.net/digital-technologies-for-years-5-6-book-1/>

<https://www.readyed.net/digital-technologies-for-years-5-6-book-2/>



STUDENT WORKBOOK

Digital Technologies: For Years 1-2



By Elli Hayward
& Alana Meuleman

Introduction

Digital Technologies: Years 1 - 2 is an excellent resource for teaching an in-depth understanding of the Lower Primary Years Digital Technology curriculum. It provides teaching information, ideas and resources for each curriculum area, along with activity pages to practise the concepts and skills.

Section One: Understanding Technology and Digital Systems explores how technology has evolved over time and helps students reflect on its impact in their everyday lives. It also explains simple digital systems and how they operate, including computer components such as hardware and software.

Section Two: Data Collection and Pattern Recognition explores data collection using digital systems and explains the importance of data, as well as how it is sorted and displayed using patterns on a computer.

Section Three: Problem Solving with Algorithms explores how digital systems are programmed with step-by-step instructions to solve problems and perform tasks, such as displaying pictures on a screen.

Section Four: Applications of the Internet explores the safe use of the internet and its functions, with a special focus on cyberbullying.

Through an array of digital learning ideas and hands-on activities/worksheets, as well as reflection tools, students gain a thorough understanding of Digital Technology covering the Year 1/2 Curriculum Outcomes. The tasks have cross-curricular links to subject areas such as Health and Physical Education, English, Science and HASS, as well as Cross-Curricular Priorities such as Aboriginal and Torres Strait Islander Histories and Cultures and Sustainability.

Curriculum Links

Curriculum Breakdown:

Section One: Understanding Technology and Digital Systems (AC9TDI2K01)

Section Two: Data Collection and Pattern Recognition (AC9TDI2K02), (AC9TDI2P01)

Section Three: Problem Solving with Algorithms (AC9TDI2P02)

Section Four: Applications of the Internet (AC9TDI2P03), (AC9TDI2P04), (AC9TDI2P05)

Digital Technologies: Students recognise and analyse digital systems and their components for a specific purpose (AC9TDI2K01)

- exploring digital systems to help comprehend how they are utilised to deliver essential services to communities, for instance, examining the systems and components enabling First Nations Australians in remote communities to access their favourite television programmes
- naming and employing digital systems that they engage with at home and school, such as using a touchpad to navigate the cursor on a laptop or utilising the keyboard to type a simple message on a tablet
- using various digital systems to explore their functions and operations, such as selecting the camera icon to capture photos of familiar objects or shapes

Students utilise various forms of representation such as pictures, symbols, numbers and words to depict data (AC9TDI2K02)

- understanding that combinations of letters signify distinct phonemes and that words maintain consistent spelling regardless of the speaker's accent
- understanding the equivalence of diverse representations of numbers, encompassing words, digits and tally mark

- recognising that pictures in First Nations Australians' seasonal calendars serve as representations to communicate data, such as the significance of a flower's appearance indicating a related event or resource availability, for example the Gulumoerrgin People of the Darwin region in the Northern Territory recognise that the wilting of freshwater mangrove signals the time to harvest magpie geese

Students explore simple problems tailored for known users that can be resolved using digital systems (AC9TDI2P01)

- exploring internet-based translation tools and examining how comparable digital tools could encourage the utilisation of First Nations Australians' languages or assist communication, for example they could respond to cultural stories of Australian First Nations People
- Exploring straightforward and easily comprehensible problems with minimal complications or steps required to solve them, for instance considering what to wear by consulting the forecast on a weather app
- recognising the ways digital systems are employed to address issues within the school environment, such as managing attendance or assisting library book borrowing
- investigating how a common problem could be addressed through the utilisation of a robot, such as designing a prototype robot from cardboard boxes and describing its potential to tidy up the classroom floor at the end of the day

Students observe and explain algorithms that involve a series of steps, branching (decisions) and iteration (repetition) (AC9TDI2P02)

- following a concise, ordered sequences of steps and making decisions to resolve a simple problem, such as adhering to a recipe or following directions to reach a location

 STUDENT
WORKBOOK Name: _____

STUDENT WORKBOOK



Digital
Technologies.
For Years 3 - 4

Sample



By Elli Hayward
& Alana Meuleman

Teachers' Notes

Digital Technologies: Years 3 - 4 is an excellent resource for teaching an in-depth understanding of the Middle Primary Years Digital Technology curriculum. It provides teaching information, ideas and resources for each curriculum area, along with activity pages to practise the concepts and skills.

Section One: Digital Systems and Devices explores the evolution of digital systems over time, how computers work, why they are important and examines peripheral devices and their everyday uses.

Section Two: Data on Computers explores the concept of data, examining digital data, and the various ways it can be collected and represented.

Section Three: Problem Solving with Algorithms explores how digital systems are programmed with step-by-step instructions to help solve problems and complete tasks. It then explores advanced algorithms using branching decision trees and provides online examples of how algorithms are created.

Section Four: Information Systems and Ethics investigates the safe use of the internet and explores its role and functions, with a focus on 'netiquette' and ethics.

Through an array of digital learning ideas and hands-on activities/worksheets, as well as reflection tools, students gain a thorough understanding of Digital Technology covering the Year 3/4 Curriculum Outcomes. The tasks have cross-curricular links to subject areas such as Health and Physical Education, English, Science and HASS, as well as Cross-Curricular Priorities such as Aboriginal and Torres Strait Islander Histories and Cultures and Sustainability.

Curriculum Links

Digital Technologies: Students explore and describe a variety of digital systems and their peripherals for various purposes (AC9TDI4K01)

- experimenting with a variety of peripherals to execute input, output and storage functions, such as a keyboard, touch screen, mouse, camera and microphone; a monitor, projector, printer or 3D printer; or speaker; or USB drive
- adding peripherals to a digital system to enhance its function, for instance, connecting a headset to a digital system to engage more effectively in an online lesson
- exploring how they can utilise digital systems differently based on a task, acknowledging that many digital systems can accomplish multiple tasks, for instance a student can use a tablet to capture photos, record audio and search for information to create a presentation

Students explore the transmission of various types of data between digital systems (AC9TDI4K02)

- examining examples of different types of data that can be transferred between digital systems, such as streaming music or making a video call using a smartphone
- exploring how data, such as video calls, can be transmitted from a remote community to a city location, for instance examining how many First Nations Australian communities in areas classified as remote rely on 3G network coverage, which limits the use of video calls

Students recognise various types of data and examine how the same data can be portrayed differently depending on the purpose (AC9TDI4K03)

- detailing different types of data and their utilisation, such as numbers, letters, symbols and images
- exploring how identical data can be represented in various formats and why specific representations are more suitable than others in particular contexts, for instance, comparing four vs 4 vs IV vs IIII vs quarter and acknowledging that numerals are more efficient for calculations compared to words
- describing that identical information can be conveyed in different forms, for instance the term 'stop' can also be represented using a red octagon-shaped sign or a hand icon

- recognising rock paintings and other cultural expressions to comprehend the images employed to encode and represent ethnobotanical knowledge, for instance the representation of plants in the Kimberley cave paintings and ancient engravings includes significant data on medicinal and food plant classification along with their usable parts

Students construe problems based on given design criteria and collaborate to create user stories (AC9TDI4P01)

- discerning a variety of familiar problems and defining attainable solutions using provided design criteria, such as purchasing presents for family members within a specified budget
- using responses to guiding questions to craft a user story, such as a friend seeks a solution for entertaining their puppy while they are at school to prevent it from digging holes
- co-creating a user story using a template such as 'A <type of user> has <some goal> so that <some reason>', for example 'A student wants to access online study materials so that they can prepare for their exams effectively'
- developing a problem statement for collecting and managing information, for example how can First Nations Australian rangers effectively monitor animal populations, such as local marine turtles, using global positioning systems (GPS)
- co-creating user stories about exploring hard-to-reach locations, for example a school student wants to explore neighbouring countries classed as remote to examine how people live

Students follow and explain algorithms involving sequencing, comparison operators (branching) and iteration (AC9TDI4P02)

- following the steps and decisions of algorithms and keeping track of the current step, for instance adhering to rules to form the past tense of regular verbs such as 'create' to 'created', 'try' to 'tried', and 'cook' to 'cooked' and marking off items on a list as they are completed
- expressing algorithms using representations such as a list of steps or a diagram, for instance creating a diagram of a recipe containing decision points

Section 1

Digital Systems and Devices

Section 1: Teachers' Notes**Additional Resources**

- Using different peripheral devices to display information to others, for example using a mobile device, interactive whiteboard, or a data projector to present information.
- Using specific peripheral devices to capture different types of data, for example using a digital microscope to capture images of living and non-living things.
- Experimenting with different types of digital system components and peripheral devices to perform input, output, and storage functions. For example a keyboard, stylus, touch screen, switch scan device or joystick to input instructions; a monitor, printer or tablet to display information; a USB flash drive and external hard drive as storage peripheral devices.
- Recognising that images and music can be transferred from a mobile device to a computer, for example using a cable to connect a camera and computer to upload images for a presentation.
- Explanation of peripheral devices and a school scavenger hunt to locate them and record.

Curriculum Focus for Section 1:**Digital Technologies:**

Students explore and describe a variety of digital systems and their peripherals for various purposes (AC9TDI4K01)

Students explore the transmission of various types of data between digital systems (AC9TDI4K02)

Students recognise various types of data and examine how the same data can be portrayed differently depending on the purpose (AC9TDI4K03)

English Year 3:

Students utilise communication skills to further conversations and discussions, sharing information and ideas (AC9E3LY02)

Students design, produce, revise and publish written and multimodal imaginative, informative and persuasive texts, using visual features, appropriate connected ideas, complex sentences, suitable tense, synonyms and antonyms, correct spelling of multisyllabic words and basic punctuation (AC9E4LY06)

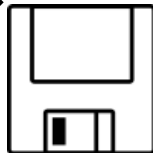
English Year 4:

Students design, produce, revise and publish written and multimodal imaginative, informative and persuasive texts, using visual features, appropriate connected ideas, complex sentences, suitable tense, synonyms and antonyms, correct spelling of multisyllabic words and basic punctuation (AC9E4LY06)

Students actively listen for key points and information to accomplish tasks and participate in discussions, they recognise alternative opinions, connect their responses to the topic and share and expand upon ideas and information (AC9E4LY02)

Page 5 - Information Page: Digital Technology with Peripheral Devices

Computer peripherals are devices that work with a computer. As technology has advanced, many different peripheral devices have been invented. Read this brief history.



The Floppy Disc: The floppy disc was invented in 1971 by IBM and was the first memory disc created. It was nicknamed "floppy" because it was flexible.

The small, flat, plastic disc was used to store computer data which was written on the disc and could be read from its surface. It was the first portable storage disc, making it possible to move data between computers.



CD/Compact Disc: In 1985, the compact disc/CD became popular as digital storage media. They are read by laser disc readers in computers. They have bigger and more efficient storage than floppy discs and could store computer files, videos and pictures.



STUDENT
WORKBOOK Name:

STUDENT WORKBOOK

Digital Technologies: For Years 5 - 6: Book 1



By Magda Parker

Introduction

Digital Technologies: Years 5 - 6: Book 1 is an excellent resource for teaching a comprehensive understanding of the Upper Primary Years Digital Technology curriculum. The Year 5 and 6 resource is divided into two parts due to the content and variety of activities designed to illustrate each curriculum area effectively.

Digital Technologies: Years 5 - 6: Book 1 focuses on Technology Past and Present, Data Representation and Software, and Computer Systems:

Section One: Technology Past and Present explores the evolution of technology over time, helping students reflect on its impact on their everyday lives. It then delves into a short history of computers and the internet, explains URLs, digital systems and the primary components of a computer.

Section Two: Data Representation examines data representation through binary systems, bits and bitmaps. This section aims to provide students with a thorough understanding of how computers generate and interpret language and images.

Section Three: Software and Computer Systems explores internet searches enabling students to practise their online research skills using credible sources and discerning information sources by analysing web addresses. It also investigates the purpose and function of computer software such as WORD and EXCEL; providing students with the skills to complete simple projects using these programs.

Through an array of digital learning ideas and hands-on activities/worksheets, as well as reflection tools, students gain a thorough understanding of Digital Technology covering the Year 5/6 Curriculum Outcomes. The tasks have cross-curricular links to subject areas such as Health and Physical Education, English, Science and HASS, as well as Cross-Curricular Priorities such as Aboriginal and Torres Strait Islander Histories and Cultures and Sustainability.

Curriculum Links

Review of Year 3/4 Curriculum Outcome:

Students examine and describe various digital systems along with their associated peripherals designed to cater to diverse purposes (AC9TDI4K01)

- experiment with an array of peripherals aimed at performing input, output, and storage functions, for example keyboards, touch screens, mice, cameras, microphones, monitors, speakers, printers, 3D printers, speakers and USB drives
- expanding the capabilities of a digital system by adding peripherals, for example connecting headphones to a digital system to enable more effective participation in an online class
- exploring the versatility of digital systems and how they can be used in different ways, depending on the task, as many digital systems can perform multiple functions, for example a student can use a phone to take photos, record audio and research information to create a multimedia presentation

Digital Technologies Knowledge and Understanding:

Students examine the primary internal components of typical digital systems and analyse their specific roles and purposes (AC9TDI6K01)

- explain how digital systems are comprised of components that execute specific functions, for example, the processor in a tablet acts as the central control unit, carrying out computations and manipulating data
- explore how a central processing unit (CPU), memory and input/output components interact to execute a simple calculation

investigating the main components in a video conferencing system and their functions, for example a telehealth system used to access ultrasound and other imagery services by communities in areas classified as remote such as those of some First Nations Australians

Students explore how digital systems connect and communicate to share data as networks (AC9TDI6K02)

- understand digital systems can exchange data by being connected through different ways, for example a laptop can connect to a network physically via cable or, it can connect wirelessly using radio waves and Wi-Fi
- describe the way data is organised and transmitted across networks in a structured manner, for example it is broken down into small pieces called packets that can flow through multiple devices from source to destination
- investigating that remote areas without access to traditional mobile phone networks, satellite phones can provide vital communication capabilities, for example many homeland communities of Arnhem Land have limited access to mainstream communication networks

Students describe how digital systems represent data using numbers (AC9TDI6K03)

- represent data by using whole numbers and recognising this is how digital systems represent data, for example they convert letters within a message as numbers based on their position in the alphabet



STUDENT WORKBOOK

Digital Technologies: For Years 5 - 6: Book 2



By Magda Parker

Introduction

Digital Technologies: Years 5 - 6: Book 2 is an excellent resource for teaching a comprehensive understanding of the Upper Primary Years Digital Technology curriculum. The Year 5 and 6 resource is divided into two parts due to the content and variety of activities designed to illustrate each curriculum area effectively.

Digital Technologies: Years 5 - 6: Book 2 focuses on Computer Programs, exploring how they function and are written. It also investigates online safety examining how to keep safe, collaborate and what to do if cyberbullying occurs. Sustainability in Information Systems is the last section in this book and investigates past and present technology possibilities.

Section One: Computer Programs and Algorithms introduces algorithms, explaining what they are and how they work. It also investigates computer programs and how they function.

Section Two: Online Safety explores online safety, including internet rules and applying protocols. It examines what is safe and unsafe online, as well as important issues like cyberbullying and online collaboration.

Section Three: Sustainability in Information Systems examines information systems and their digital needs. It also explores the potential uses of current and future technology.

Through an array of digital learning ideas and hands-on activities/worksheets, as well as reflection tools, students gain a thorough understanding of Digital Technology covering the Year 5/6 Curriculum Outcomes. The tasks have cross-curricular links to subject areas such as Health and Physical Education, English, Science and HASS, as well as Cross-Curricular Priorities such as Aboriginal and Torres Strait Islander Histories and Cultures and Sustainability.

Curriculum Links

Digital Technology:

Students define problems with given or co-developed design criteria and by creating user stories (AC9TDI6P01)

- utilising supplied stimulus to recognise an issue and writing a user story in groups, for example using a newspaper article to develop a user story, such as: a family in a bushfire or flood-prone environment needs a way to verify they are prepared in case of an emergency
- examining possible design criteria based on a stimulus, for example the price, sustainability and timeliness for a roadside bushfire or flood risk rating system
- exploring the effect that feral animals have on native flora and fauna and how this problem has led to economic development opportunities for groups such as Arnhem Land Progress Aboriginal Corporation

Students design algorithms that incorporate multiple alternatives (branching) and iteration (AC9TDI6P02)

- designing an algorithm or comprehending and adjusting an existing algorithm to rectify an error or alter functionality, for instance, investigating concerns in drought-prone areas to determine when to water a garden, considering humidity alongside soil moisture levels
- creating the steps, decisions, and loops in algorithms and understanding their progression, for instance repeating steps to sum two digits for each column in multi-digit addition, being aware of the column being processed and determining when to halt the addition process
- constructing multiple sequences of steps that address the same problem and explaining why one sequence is superior to another, for instance delineating the precise path through a maze versus employing the right-hand rule, which is effective for all mazes

- modelling a decision with more than two options for selecting the next step, for instance determining transportation: IF the distance is more than 10 km THEN walk, ELSE IF the distance is less than 5 km THEN take a bike, ELSE catch the bus
- planning algorithms that iterate until a condition is satisfied, such as continuously mixing UNTIL the ingredients are fully combined or subtracting a number UNTIL the result equals zero
- designing an algorithm involving branching and iteration to respond to data, such as how First Nations Australian rangers employ structured procedures to address live tracking data indicating the approach of feral buffalo to an environmentally or culturally significant site

Students design a user interface (UI) for a digital system (AC9TDI6P03)

- creating a user interface on paper or using digital tools, for example sketching the designed layout of the landing page of an app to order lunches from the school canteen
- creating a user interface to meet a specific requirement, such as incorporating adjustable font size and colour contrast options, aimed at assisting visually impaired users
- modelling how user interfaces facilitate access to information for individuals from diverse cultural and linguistic backgrounds, such as employing consistent symbols to denote common actions like copy, paste and save

Students create, adapt, convey and assess designs (AC9TDI6P04)

- brainstorming a variety of design concepts, engaging in discussions about them and evaluating them against design criteria and user stories, for instance prioritising design ideas based on the design criteria during group deliberations