**DIGITAL TECHNOLOGIES:**

**UNPACKING THE CONTENT DESCRIPTIONS**

PLEASE NOTE:
This pack does not contain all content descriptions for Levels 9 and 10, but can be used as a guide to develop your own lesson plans

**Digital Technologies: Unpacking the Content Descriptions**

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| **Strand** | Creating Digital Solutions |  | **Sample activities** |
| **Content Description** | Design algorithms represented diagrammatically and in structured English and validate algorithms and programs through tracing and test cases | * describing algorithms using structured English
* drawing algorithms in the form of flow charts to solve problems that use different control structures
* creating algorithms that use various functions and data structures
* developing algorithms that incorporate basic object-orientated programming concepts
* testing the expected output of algorithms using trace tables and desk checking if necessary in order to make modifications and record results
* validating input data.
 |
| **Related extract from Achievement Standard** | They design and evaluate user experiences and algorithms, and develop and test modular programs, including an object-oriented program. |
| **Suggested focus** | Lessons may focus on:* review of control structures (sequence, branching/selection and repetition/iteration)
* modelling how algorithms can be used to solve a problem
* creating algorithms in the form of flow charts
* algorithms as pseudocode, such as structured English
* various techniques for tracing and testing algorithms
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| **Strand** | **Creating Digital Solutions** |  | **Sample activities** |
| **Content Description** | Develop modular programs, applying selected algorithms and data structures including using an object-oriented programming language | * reviewing general-purpose programming languages
* watching a video explanation of how object-orientated programming is used in games and software applications
* playing a favourite game and identifying the objects, events and properties and explaining how an object’s behaviour is affected by events and actions
* developing different algorithms to meet the requirements and select the most appropriate algorithm
* describing a range of programming features, such as procedures, functions and methods
* creating programs that use objects, events, classes, methods and a range of properties
* testing the functionality of the program
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| **Related extract from Achievement Standard** | They design and evaluate user experiences and algorithms, and develop and test modular programs, including an object-oriented program. |
| **Suggested focus** | Lessons may focus on:* review of general-purpose programming language features and functions from Levels 7 and 8
* introduction to key terminology and concepts of object-orientated programming
* introduction to objects and properties, events, classes and methods
* programming exercises and activities
* debugging programs (troubleshooting)
* testing code through the use of testing tables
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**Digital Technologies: Unpacking the Content Descriptions**

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| **Strand** | **Data and Information** |  | **Sample activities** |
| **Content Description** | Develop techniques for acquiring, storing and validating quantitative and qualitative data from a range of sources, considering privacy and security requirements | * using online survey tools to conduct an online poll, identifying quantitative and qualitative data and the purpose of each
* identifying and retrieving public data sets
* using a mobile phone’s sensors to collect data
* methods for validating data and when to use each method
* use of data types in acquiring data
* converting between different formats of structured data, for example an Excel file and a CSV file
* spreadsheets and databases for storing and structuring data and functions for validating data
* examining case studies relating to ethical and legal requirements for data collection and storage
* identifying the relevant sections of the Privacy Act (1988) and the Privacy and Data Protection Act 2014 regarding data collection and storage
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| **Related extract from Achievement Standard** | They take account of privacy and security requirements when selecting and validating data and use digital systems to analyse, visualise and model salient aspects of data. |
| **Suggested focus** | Lessons may focus on:* strategies for capturing data
* primary/secondary sources
* qualitative/quantitative data and data types
* forms of validation and why they are used
* use of structured data
* understanding spreadsheets
* understanding databases
* ethical and legal responsibilities for data collection
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**Digital Technologies: Unpacking the Content Descriptions**

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| **Strand** | **Data and Information** |  | **Sample activities** |
| **Content Description** | Manage and collaboratively create interactive solutions for sharing ideas and information online, taking into account social contexts and legal responsibilities | * developing class and individual protocols about expected online behaviour
* developing policies regarding data collection and retention
* investigating the difference between cloud storage options and decentralised storage options, such as Blockchain
* brainstorming and storyboarding ideas for a collaborative website
* building a team project plan with timelines and milestones using a collaborative online platform
* investigating strengths and weaknesses of team members and allocating appropriate roles
* creating site maps and designing templates for a proposed website
* managing and creating content and assets
* developing a collaborative website
* designing and implementing data security protocols and a privacy statement as part of the website’s terms and conditions
 |
| **Related extract from Achievement Standard** | Students share and collaborate online, establishing protocols for the legal and safe use, transmission and maintenance of data and projects. |
| **Suggested focus** | Lessons may focus on:* digital citizenship (online safety and social responsibility) and how it relates to privacy
* information architecture
* project management and team solutions
* designing and developing interactive solutions, such as websites
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**Digital Technologies: Unpacking the Content Descriptions**

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| **Strand** | **Digital Systems** |  | **Sample activities** |
| **Content Description** | Investigate the role of hardware and software in managing, controlling and securing the movement of and access to data in networked digital systems | * communicating with each other using simple physical devices and protocols
* investigating the history and development of the Internet
* investigating two different operating systems with regards to characteristics, such as security, processing and storage
* demonstrating an understanding of packet switching, routing and protocols
* evaluating the advantages and disadvantages of different transmission media used in networks, for example Wi-Fi, Ethernet and fibre-optic
* listening to a talk by the school’s IT Manager about the school network and how data is secured
* using Visio to create a network map of a building in the school, clearly identifying network configuration, devices and transmission media
* making recommendations concerning the security implications for a sample network
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| **Related extract from Achievement Standard** | Students explain the control and management of networked digital systems and the data security implications of the interaction between hardware, software and users. |
| **Suggested focus** | Lessons may focus on:* investigation of different types of networks and security features
* characteristics of key hardware and software components
* communication protocols and standards
* transmission media
* network configurations
* visual representation of common networks
* security implications of the network and user levels
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