**Unit Outline and Rationale**

**Band Description**

Learning in Digital Technologies focuses on further developing understanding and skills in computational thinking such as decomposing problems and prototyping; and engaging students with a wider range of information systems as they broaden their experiences and involvement in national, regional and global activities.

By the end of Year 8, 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.

In Year 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, environmental, economic and social constraints.

They further develop abstractions 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 defining 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.

**Achievement Standard**

By the end of Year 7, students distinguish between different types of networks and defined purposes. They explain how text, image and audio data can be represented, secured and presented in digital systems. Students plan and manage digital projects to create interactive information. They define and decompose problems in terms of functional requirements and constraints. Students design user experiences and algorithms incorporating branching and iterations, and test, modify and implement digital solutions. They 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 solutions. They use appropriate protocols when communicating and collaborating online.

**General Capabilities**

Applying social and ethical protocols and practices when using ICT

1. identify the legal obligations regarding the ownership and use of digital products and apply some referencing conventions
2. independently apply strategies for determining and protecting the security of digital information and assess the risks associated with online environments
3. identify and value the rights to identity, privacy and emotional safety for themselves and others when using ICT and apply generally accepted social protocols when using ICT to collaborate with local and global communities
4. explain the benefits and risks of the use of ICT for particular people in work and home environments

Investigating with ICT

1. use a range of ICT to analyse information in terms of implicit patterns and structures as a basis to plan an information search or generation
2. locate, retrieve or generate information using search facilities and organise information in meaningful ways
3. assess the suitability of data or information using appropriate own criteria

Creating with ICT

1. use appropriate ICT to collaboratively generate ideas and develop plans to explain the main uses of ICT at school, home and in the local community, and recognise its potential positive and negative impacts on their lives
2. design and modify simple digital solutions, or multimodal creative outputs or data transformations for particular audiences and purposes following recognised conventions

Communicating with ICT

1. select and use appropriate ICT tools safely to lead groups in sharing and exchanging information, and taking part in online projects or active collaborations with appropriate global audiences
2. understand that there are various methods of collaboration through computer mediated communications that vary in form and control

Managing and Operating ICT

1. independently select and operate a range of devices by adjusting relevant software functions to suit specific tasks, and independently use common troubleshooting procedures to solve routine malfunctions
2. identify and compare networked ICT system components including between hardware, software and datamanage and maintain data on different storage mediums – locally and on networks
3. Manage and maintain data for groups of users using a variety of methods and systems

**Australian Curriculum Cross Curriculum Priorities**

In the Australian Curriculum: The Arts, these priorities will have a strong but varying presence, depending on the subject. Icons or abbreviations indicate where cross-curriculum priorities have been identified in The Arts content descriptions and elaborations. Teachers may find further opportunities to incorporate explicit teaching of the priorities, depending on their choice of activities.

**Aboriginal and Torres Strait Islander histories and cultures**

In the Australian Curriculum: The Arts, the Aboriginal and Torres Strait Islander histories and cultures priority enriches understanding of the diversity of art-making practices in Australia and develops appreciation of the need to respond to artworks in ways that are culturally sensitive and responsible. The Arts explores the intrinsic value of the artworks and artists’ practices of Aboriginal and Torres Strait Islander people as well as their place and value within broader social, cultural, historical and political contexts.

The Australian Curriculum: The Arts enables the exploration of art forms produced by Aboriginal and Torres Strait Islander people. The Arts explores the way the relationships between People, Culture and Country/Place for Aboriginal and Torres Strait Islander Peoples can be conveyed through a combination of art forms and their expression in living communities, and the way these build Identity. It develops understanding of the way Aboriginal and Torres Strait Islander arts practices can involve combining art forms for both practical and cultural reasons. It recognises the way that Aboriginal and Torres Strait Islander artists work through and within communities in diverse contemporary, mediated and culturally endorsed ways, enabling artists to affirm connection with Country/Place, People and Culture.

In the Arts, students learn that the oral histories and belief systems of Aboriginal and Torres Strait Islander Peoples are contained in and communicated through cultural expression in story, movement, song and visual traditions. They have opportunities to participate in a variety of Aboriginal and Torres Strait Islander art forms that are publicly available for broader participation. Students may also extend their cultural expression with appropriate community consultation and endorsement.

**Asia and Australia’s engagement with Asia**

In the Australian Curriculum: The Arts, the Asia and Australia’s engagement with Asia priority provides rich, engaging and diverse contexts in which students make and respond to artworks and explore their related cultural and social significance. This priority enables investigation of the role of the Arts in developing, maintaining and transforming cultural beliefs and practices and communicating an understanding of the rich cultural diversity of the Asia region.

The Australian Curriculum: The Arts examines art forms that have arisen from the rich and diverse belief systems and traditions of the Asia region. Students will consider the aesthetic qualities of these art forms as well as their local, regional and global influence. The Arts provides opportunities to explore how artistic collaboration takes place within and across countries of the Asia region, including Australia.

In The Australian Curriculum: The Arts, students engage with a variety of art forms, media, instruments and technologies of the Asia region. In doing so, they reflect on the intrinsic value of these artworks and artists’ practices as well as their place and value within broader social, cultural, historical and political contexts.

**Sustainability**

In the Australian Curriculum: The Arts, the Sustainability priority provides engaging and thought-provoking contexts in which to explore the nature of art making and responding.

The Sustainability priority enables the exploration of the role of the Arts in maintaining and transforming cultural practices, social systems and the relationships of people to their environment. Through making and responding in the Arts, students consider issues of sustainability in relation to the resource use and traditions in each of the Arts subjects. The Arts provides opportunities for students to express and develop world views, and to appreciate the need for collaboration within and between communities to implement more sustainable patterns of living.

In this learning area, students use the exploratory and creative platform of the Arts to advocate effective action for sustainability. This action is informed by a range of world views, and the need for social justice and ecosystem health. Students choose suitable art forms to communicate their developing understanding of the concept of sustainability and to persuade others to take action for sustainable futures.

**Australian Curriculum Focus**

|  |
| --- |
| **Digital Technology Content Descriptions** |
| **Code** | **Content Description** |
| **Digital Technologies Knowledge and Understanding** |
| * Investigate how data are transmitted and secured in wired, wireless and mobile networks, and how the specifications of hardware components impact on network activities (ACTDIK023)
 |
| * Investigate how digital systems represent text, image and audio data in binary (ACTDIK024)
 |
| **Digital Technologies Processes and Production Skills** |
| * Acquire data from a range of sources and evaluate authenticity, accuracy and timeliness (ACTDIP025)
 |
| * Analyse and visualise data using a range of software to create information, and use structured data to model objects or events (ACTDIP026)
 |
| * Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)
 |
| * Design the user experience of a digital system, generating, evaluating and communicating alternative designs (ACTDIP028)
 |
| * Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors (ACTDIP029)
 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **SEMESTER ONE: TERMS 1 & 3****Teaching and Learning focus****(Content, skills, standards, understandings, resources)** | **Assessment** | **General Capabilities**  |
| Week | **Unit** | **Aust Curric Links** | **Teaching and Learning Strategies** **& Resources** | **Formative (F)****Summative (S)** |  |
| **1** | **What is Data?** | ACTDIK024 | FOCUS: * **What is binary?**
* **Text & Numbers**
* **File Types**

ACTIVITY:* **Binary Coding Exercise**
 | Binary Circuit Exercise (F) | **GC5, GC7, GC9** |
| **2** | **PowerPoint Animation Skills**  | ACTDIK024ACTDIP026 | ACTIVITY:**Students convert their notes form Week One into an interactive animation.** | Refresher questions (F)Ongoing assistance with PowerPoint activity (F)**Progress mark (S)**Content: 5 MarksP’Point: 5 Marks | **GC5, GC7, GC9** |
| **3** | **File Types and Data Types – Memory.** | ACTDIK024ACTDIK023 | FOCUS: * **Data Types: text, numeric, audio, image, video**
* **File Types: exe, jpg, wav, mp3, etc.**
 | Refresher questions (F)Discussion and Questions on Class notes (F) |  |
| **4** | **PowerPoint Animation Skills**  | ACTDIK024ACTDIP026 | ACTIVITY:**Students convert their notes form Week Three into their interactive animation.** | Refresher questions (F)Ongoing assistance with PowerPoint activity (F)**Progress mark (S)**Content: 5 MarksP’Point: 5 Marks | **GC5, GC7, GC9** |
| **5** | **Hardware****Software****Networks** | ACTDIK024ACTDIK023 | FOCUS: * Hardware
* Software
* Network Transmission
 | Refresher questions (F)Discussion and Questions on Class notes (F) |  |
| **6** | **PowerPoint Animation Skills**  | ACTDIK024ACTDIP026 | ACTIVITY:* **Students convert their notes form Week Four into their interactive animation.**
 | Refresher questions (F)Ongoing assistance with PowerPoint activity (F)**Progress mark (S)**Content: 5 MarksP’Point: 5 Marks | **GC5, GC7, GC9** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **SEMESTER ONE: TERMS 1 & 3****Teaching and Learning focus****(Content, skills, standards, understandings, resources)** | **Assessment** |  |
| week | **Unit** | **Aust Curric Links** | **Teaching and Learning Strategies** | **Formative (F)****Summative (S)** | **General Capabilities** |
| **7** | **(NOT IN TERM I)** | ACTDIK024ACTDIK023 | PROJECT: **Analyse and visualize all notes into an interactive animation** | **Progress mark (S)**Content: 5 MarksP’Point: 5 Marks  |  |
| **8** |  | ACTDIK024ACTDIP026 | ASSESSMENTPROJECT: **Analyse and visualize all notes into an interactive animation**  | **TEST (S)**20 Marks**Project DUE: (S)**Content 10 marksP’Point 10 Marks |  |
| **9** | **(TERM 3 ONLY)** |  | FOCUS: Web Development Notes and Skills |  |  |
| **10** | **(TERM 3 ONLY)** |  | FOCUS: * Web Development Notes and Skills
 |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **SEMESTER TWO: TERMS 2 & 4****Teaching and Learning focus****(Content, skills, standards, understandings, resources)** | **Assessment** | **General Capabilities**  |
| Week | **Unit** | **Aust Curric Links** | **Teaching and Learning Strategies**  | **Formative (F)****Summative (S)** |  |
| **1** | **How to Do Research** | ACTDIK025 | FOCUS: Using the Internet to do Research* ***Keywords***
* ***Is it TRUE?***
* ***Wikipedia OK or NOT OK?***

ACTIVITY:Looking online for key information – Reporting back when info is found.Discussion on reliability of data. | Research activity (F)Discussion (F) |  |
| **2** | **Technology Issues** | ACTDIP027ACTDIP028ACTDIK025 | FOCUS: * **Exploring IT related ISSUES including social, environmental, access etc.**
* **Each student is given ONE topic to research and write 5 - 10 questions in a survey monkey survey.**
 | Research activity (F)Discussion (F)**Project Progress (S)**Questions: 5 Marks |  |
| **3** | **Technology Issues** | ACTDIP027ACTDIP028ACTDIK025 | FOCUS: * **Exploring IT related ISSUES including social, environmental, access etc.**
* **Students complete ALL the surveys.**
* **Looking at the data and interpreting it.**
* **SAVE your findings.**

**HW TASK: Find ONE website online that SUPPORTS your finding.** | Research activity (F)Discussion (F)**Project Progress (S)**Interpretation: 5 Marks |  |
| **4** | **Spreadsheets** | ACTDIP027ACTDIP028ACTDIK025ACTDIK024ACTDIK023 | FOCUS: * **Using data in a Spreadsheet; Enter the data to create a graph.**
* **Using Snipping Tool to create images for your website.**
* **Using Graphic software (Paint/Photoshop) to edit your graphics thematically.**
 | Research activity (F)Discussion (F)**Project Progress (S)**HW: 5 MarksGraphics: 5 Marks |  |
| **5** | **Web Development** | ACTDIK023 | FOCUS: * **Making a Website for the final Project: Safe Use of Technology**
* **HTML structure provided**
* **Demonstrate links**
 | HTML activity (F)**Project Progress (S)**Files: 5 MarksLinks: 5 Marks |  |
| **6** | **Complete Project** | ACTDIP027ACTDIP028ACTDIK025ACTDIK024ACTDIK023 | FOCUS: * **Students complete their HTML Website: Safe Use of Technology**
 | **Project DUE(S)**Content 10 marksStructure 10 Marks |  |
| **7** | **Algorithms** | ACTDIP029ACTDIK024 | FOCUS: * **Input/Output/Processing**
* **Programming**
* **Algorithms as diagrams**
* **Algorithms as Pseudocode**
 | **Notes and Class discussion (F)****Algorithm Activity (S)** |  |
| **8** | **Programming in SB** | ACTDIP029ACTDIK024 | FOCUS: * **Introductions to Small Basic**
* **Creating a conversation**
* **Calculations**
 | **Notes and Class discussion (F)****SB Activity****Basic Exercise Completed (S)** |  |
| **9** |  | ACTDIP029ACTDIK024 | **TEST: Algorithms and Small Basic** | **TEST (S)** |  |
| **10** |  | TBA |  |  |  |