Government of **Western Australia**
**School Curriculum and Standards Authority**

# SAMPLE TEACHING AND LEARNING OUTLINE

## TECHNOLOGIES

## DIGITAL TECHNOLOGIES

## YEAR 3

2020/16660v4

This document is an introduction to planning a teaching and learning outline with syllabus content for Year 3 Digital Technologies. It provides suggested sequencing and timing for teaching the syllabus content. For further details on curriculum requirements and available options, teachers should refer to the School Curriculum and Standards Authority's (the Authority's):

- *Policy Standards for Pre-primary to Year 10: Teaching, Assessing and Reporting*
- Table 1: *Western Australian Curriculum and Assessment Outline*: curriculum requirements and available options.

Sample plans provide a range of possible learning experiences from which assessment should be drawn. This *Year 3 Sample Teaching and Learning Outline* provides teachers with possible learning experiences over 35 hours and unpacks the syllabus content to assist teachers in their understanding.

A presentation (*Western Australian Curriculum Technologies Presentation*), which unpacks the process to develop this plan, is available on the Presentations page of the Authority website (https://k10outline.scsa.wa.edu.au/home/resources/presentations).

The syllabus content for Digital Technologies is listed below.

## Year 3 Syllabus Content – Digital Technologies

| Content | Description |
|---|---|
| **Digital systems** | Digital systems and peripheral devices are used for different purposes |
| **Representation of data** | Different types of data can be represented in different ways |
| **Collecting, managing and analysing data** | Collect and present different types of data using simple software to create useful information |
| **Digital implementation** | Use visually represented sequenced steps (algorithms), including steps with decisions made by the user (branching)<br>Create and communicate ideas and information safely |
| **Investigating and defining** | Create a sequence of steps to solve a given task |
| **Designing** | Develop and communicate ideas using labelled drawings and appropriate technical term |
| **Producing and implementing** | Select, and safely use, appropriate components with given equipment to make a solution |
| **Evaluating** | Use criteria to evaluate design processes and solutions developed |
| **Collaborating and managing** | Work independently, or collaboratively when required, to plan, create and communicate sequenced steps |

**Year Level Description**

In Year 3, students further develop understanding and skills in computational thinking, such as categorising and outlining procedures. They have opportunities to create solutions, such as interactive adventures and simple guessing games that may involve user choice.

Students explore digital systems in terms of their components, and peripheral devices, such as digital microscopes, cameras and interactive whiteboards. They collect and present data, developing an understanding of the characteristics of data and their representation.

Students learn to define simple problems using techniques to deduce and explain simple conclusions. They learn to develop their design skills by following prepared algorithms to describe branching (choice of options). Students experiment with appropriate software, including visual programming environments that use graphical elements, such as symbols and pictures to implement their solutions.

Students continue to develop an understanding of communicating ideas and information safely when using digital technologies.

| Year 3 Learning Area: Technologies – Digital Technologies | | | |
|---|---|---|---|
| **Year 3 Achievement Standard**<br><br>At Standard, students explore and recognise some differences and the purpose of digital systems and peripheral devices and present data in a variety of ways. Students develop ideas with sequenced steps (algorithms) and branching, using simple software to collect and present data. They work with others to create and communicate ideas and information.<br><br>In digital technologies, students create sequenced steps (algorithms) to solve a given digital task. They develop and communicate ideas using labelled drawings and appropriate technical terms. Students select and safely use appropriate components with given equipment to make a solution. They use criteria to evaluate design processes and solutions developed. Students work independently, or collaboratively, to plan, safely create and communicate sequenced steps. | | | |
| **Approx. hours** | **Syllabus content** | **Content unpacked** | **Suggested teaching and learning experiences** |
| 6 | **Digital implementation**<br>Create and communicate ideas and information safely | • Students need to understand the risks of sharing and creating information in an online environment.<br>• Netiquette is a term used to describe how to act in a respectful way online. Students need to understand how to conduct themselves in person and in an online environment.<br>• Digital citizenship is a term that refers to a person who knows and understands how to effectively communicate in the online world with respect and manners. These protocols keep online users safe and included in a digital world. | • Students create a set of manners that are used at home. These are than ranked on importance. Students explain why these rules are in place. These rules can then be categories into online or off online to show the links between the real world and the World Wide Web. More rules can be added at this stage for the online environment.<br>Below are a variety of resource to help deliver content for e-safety and netiquette:<br>• E-safety commissioner resources (https://www.esafety.gov.au/educators/video-resource-library)<br>• Digital citizenship (https://www.digitaltechnologieshub.edu.au/teachers/topics/digital-citizenship)<br>• Communicate ideas and information (https://www.digitaltechnologieshub.edu.au/teachers/scope-and-sequence/3-4/collaboration-and-protocols/communicate-ideas-and-information)<br>• Cybersaftey videos and links (https://www.digitaltechnologieshub.edu.au/students/cybersafety)<br>• Sample assessment task: Safety first when online (https://k10outline.scsa.wa.edu.au/home/assessment/assessment-activities/year3). |
| 6 | **Digital systems**<br>Digital systems and peripheral devices are used for different purposes | • A digital system is used to transport data from one place to another or to simply process inputs into outputs.<br>• Peripheral devices are not essential for a computer to run, although they make computers and devices more user-friendly and useable.<br>• Peripheral devices are categorised as input or output devices.<br>• Input devices include:<br>▪ keyboard<br>▪ mouse<br>▪ touch screen<br>▪ scanner<br>▪ microphone.<br>• Output devices include:<br>▪ printer<br>▪ monitor<br>▪ speakers<br>▪ projector.<br>• Each peripheral device has an intended purpose in order to make the user's experience more efficient and beneficial. | • Sorting cards. In small groups students try and categorise the list of peripherals given into either input, output or both. Students can then look at other groups to get ideas before explaining their decisions.<br>• Students draw a diagram that includes two input and two output devices and indicate the flow of data that is occurring.<br>• Exploring data (http://technologiesjvillis.weebly.com/data.html)<br>• Extra resources of input/output devices:<br>▪ Mind Meister input-output in the classroom (https://www.mindmeister.com/185152943/input-output-devices-in-the-classroom)<br>▪ Code.org Curriculum Lesson 5: input and output devices (https://curriculum.code.org/csd-1718/unit1/5/)<br>▪ Crazy 4 Computers input and output devices (http://www.crazy4computers.net/input--output-devices.html).<br>• Students are required to compare and contrast different examples of input or output devices and their suitability for purpose. For example, students can research or be given three options of a monitor to choose from. Students then justify why they chose the device based on their personal wants or needs. Students should do at least one input and one output example with justification to reiterate the difference between the two types of peripherals. |

<table>
<tr><th>Approx. hours</th><th>Syllabus content</th><th>Content unpacked</th><th>Suggested teaching and learning experiences</th></tr>
<tr>
<td>7</td>
<td>Designing<br>Develop and communicate ideas using labelled drawings and appropriate technical term<br><br>Investigating and defining<br>Create a sequence of steps to solve a given task<br><br>Collaborating and managing<br>Work independently, or collaboratively when required, to plan, create and communicate sequenced step</td>
<td>• Common content included in a storyboard are:<br>▪ sketches of key scenes/slides<br>▪ the main event in each scene or content of slides<br>▪ actions that will take place<br>▪ audio and/or text to be added.<br>• Sequence is the logical order. Computers work sequentially, line by line, top to bottom. If the order is incorrect, a logic error will be given. Students cannot put shoes on before socks; a computer works in the same way. Students need to understand that logical sequence is very important in programming.<br>• Solutions need to be innovative and incorporate problem-solving skills.<br>• Available resources should include hardware and software. Students need to justify why they have chosen selected hardware or software.</td>
<td>• Students create basic algorithms as a class, such as making toast or their journey to school. Focusing on the sequence of events.<br>• Algorithm creation.<br>• Computer Science Field Guide Algorithms 2.3. Sorting (https://csfieldguide.org.nz/en/chapters/algorithms/sorting/).<br>• Sample assessment task: Game Time (https://k10outline.scsa.wa.edu.au/home/assessment/assessment-activities/year3).</td>
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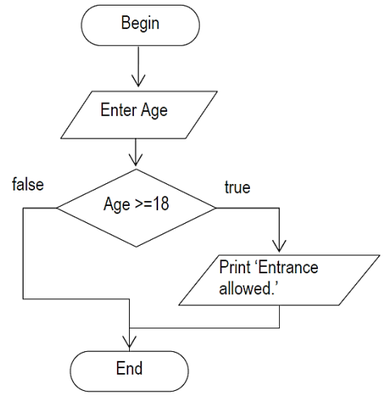
<td>4</td>
<td>Digital implementation<br>Use visually represented sequenced steps (algorithms), including steps with decisions made by the user (branching)<br><br>Producing and implementing<br>Select, and safely use, appropriate components with given equipment to make a solution</td>
<td>• Sequence of steps refers to the order of a program. This must be logical to avoid any logic errors.<br>• Branching is a term that refers to having more than one intended outcome.<br>• The digital solution must have choices. These are called selection. The three types of selection are:<br>▪ one-way selection (if-then)<br>▪ two-way selection (if-then-else)<br>▪ multiway selection (CASE).<br>• Common symbols in a flowchart and what they represent; for example:<br>▪ start and end (rounded rectangle or oval)<br>▪ process (rectangle)<br>▪ decision (diamond)<br>▪ input/output (parallelogram)<br>▪ line connectors (arrow).</td>
<td>• Students use their previous basic algorithms to create simple flowcharts. After this is completed, a decision is added, such as walking or taking the bus to school. This is then changed on the algorithm and rewritten on their flowcharts. Other options include creating toast with butter and jam as two options.<br>• Students are tested with the symbols versus what they represented through actions when the teacher calls out the action, i.e. ‘decision’ is called out by the teacher, students make a diamond with their hands.<br>• Sample assessment task: Game Time (https://k10outline.scsa.wa.edu.au/home/assessment/assessment-activities/year3).
<table>
<tr><th>Flowchart</th><th>Pseudocode</th></tr>
<tr>
<td> 
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<td>One way selection<br>If condition then<br><br>Input (Age)<br>If Age >= 18 then<br>Output (‘Entrance allowed’)<br>End If</td>
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| Approx. hours | Syllabus content | Content unpacked | Suggested teaching and learning experiences |
|---|---|---|---|
| 2 | **Evaluating**<br>Use criteria to evaluate design processes and solutions developed | • Criteria to evaluate design process:<br>  ▪ modifications required<br>  ▪ design features.<br>• Criteria to evaluate the solution:<br>  ▪ original sketch, diagram<br>  ▪ final product<br>  ▪ collaboration with peers to evaluate plan, safety and final product. | • Students get creative with game ideas. These should be a basic idea, such as matching components from digital systems or flowchart symbols.<br>• For the chosen game:<br>  ▪ develop agreed and specific criteria to evaluate the design process, such as:<br>  ○ design features of the game<br>  ○ the rules of the game<br>  ○ ease of construction – refer to sequence of steps, diagrams.<br>  ▪ develop agreed and specific criteria to evaluate the solution; for example:<br>  ○ aesthetics – colour, overall appeal<br>  ○ compare to original design sketch, diagram.<br>  ▪ evaluate, in collaboration with a peer, by:<br>  ○ communicating detailed and logically sequenced steps<br>  ○ explaining how processes were implemented safely<br>  ○ discussing the plan of how the game will be used.<br>• List and validate changes, if they were to make the game again. |
| 6 | **Representation of data**<br>Different types of data can be represented in different ways | • The same data can be represented in different ways depending on its purpose.<br>• Types of data include:<br>  ▪ numbers<br>  ▪ letters<br>  ▪ symbols<br>  ▪ images<br>  ▪ sound<br>  ▪ video.<br>• To process any type of data, a computer must convert the data into simple binary format. Binary is at base-2, meaning it consists of simply a one (1) or a zero (0). This represents the on and off states of electrical pulses being sent. | • Students are given a screenshot of a website. Students then label the types of data shown on the website.<br>Teachers can choose from the activities below to develop classroom learning activities.<br>• Data project 'Clean Schools' (https://australiancurriculum.edu.au/resources/work-samples/samples/data-project-clean-school-at/)<br>• Secret messages and code (https://www.digitaltechnologieshub.edu.au/teachers/scope-and-sequence/3-4/data-collect-organise-and-create/secret-messages-and-codes)<br>• Resource cards (https://www.teachstarter.com/australian-curriculum-categories/technologies/digital-technologies/digital-technologies-years-3-and-4/digital-technologies-years-3-and-4-digital-technologies-knowledge-and-understanding/actdik008/)<br>• Unplugged activity (https://csfieldguide.org.nz/en/chapters/data-representation/) |
| 4 | **Collecting, managing and analysing data**<br>Collect and present different types of data using simple software to create useful information | • Data is unprocessed, raw information.<br>• Information is processed, useful data.<br>• Data can be presented in a variety of ways to be informative, educational and match the intended target audience. | • Students are challenged to create a new definition of either data or information. Class votes on the best definition to add to the word wall.<br>Useful link:<br>• Digital Technologies Hub – Use Data to Solve Problems (https://www.digitaltechnologieshub.edu.au/teachers/scope-and-sequence/3-4/data-collect-organise-and-create/use-data-to-solve-problems).<br>• Students are to research or gather some statistics about computer hardware. It can include collecting favourite video game data or could be about tablets being sold. Once data is collected, students present this in infographic form. This can be created online through piktochart or similar software. Students should produce an A4 image that delivers informative statistics in a fun, colourful and easy to read way. Teachers can also guide students to websites that have relevant data. |

Note: the above Teaching and Learning Outline is based on two hours per week for a total of 35 hours.