Government of Western Australia
School Curriculum and Standards Authority

Sample Teaching and Learning Outline

Technologies

Digital Technologies

Year 4

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This document is an introduction to planning a teaching and learning outline with syllabus content for Year 4 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.

Schools may choose to teach the syllabus content for two hours per week for a semester, **or** one hour per week for the year. Sample plans provide a range of possible learning experiences from which assessment should be drawn. This *Year 4 Sample Teaching and Learning Outline* provides teachers with possible learning experiences over eight weeks 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).

Year 4 Syllabus Content – Digital Technologies

Content	Description
Digital systems	Digital systems and peripheral devices are used for different purposes and can store and transmit different types of data
Representation of data	Data can be represented in different ways
Collecting managing and analysing data	Collect and present different types of data for a specific purpose using software
Digital implementation	Use simple visual programming environments that include a sequence of steps (algorithm) involving decisions made by the user (branching) Create and communicate ideas and information safely, using agreed protocols (netiquette)
Investigating and defining	Define a sequence of steps to design a solution for a given task Identify and choose the appropriate resources from a given set
Designing	Develop and communicate design ideas and decisions using annotated drawings and appropriate technical terms
Producing and implementing	Select, and safely use, appropriate components and equipment to make solutions
Evaluating	Use criteria to evaluate and justify simple design processes and solutions
Collaborating and managing	Work independently, or collaboratively when required, to plan, create and communicate ideas and information for solutions

Year Level Description

In Year 4, students further develop understanding and skills in computational thinking, such as categorising and outlining procedures. They have opportunities to create a range of solutions, such as interactive adventures that involve user choice, modelling simplified real world systems.

Students explore digital systems in terms of their components, and peripheral devices, such as digital microscopes, cameras and interactive whiteboards. They collect, manipulate and interpret data, developing a capacity to use data and their representations to communicate ideas.

Students learn to define problems and to deduce and record conclusions through text and diagrams. They have opportunities to experiment with refining designing skills, describing their own algorithms that support branching (choice of options) and user input. Students implement solutions using appropriate software, including visual programming environments that use a variety of graphical elements. They define solutions to meet specific needs and consider society's use of digital systems that meet community requirements.

Students explain the safety aspects of communicating ideas and information using digital technologies.

Year 4 Learning Area: Technologies – Digital Technologies

Year 4 Achievement Standard

At Standard, students identify different purposes for digital systems and peripheral devices, recognising they can store and transmit a variety of data. They use simple visual programming, including a sequence of steps (algorithms) and branching, students represent data in a range of ways. They create and communicate ideas and information and use software to collect and represent different types of data, using agreed protocols (netiquette).

In digital technologies, students use algorithms (sequenced steps) to design a solution for a given digital task. They identify and choose the appropriate resources from a given set. Students develop and communicate design ideas and decisions, using annotated drawings and appropriate technical terms. They select and safely use appropriate components and equipment to make solutions. Students use criteria to evaluate and justify simple design processes and solutions for a given digital task. They work independently, or collaboratively, to plan, safely create and communicate ideas and information for solutions.

Weeks	Syllabus content	Content unpacked	Suggested teaching and learning experiences
1–2	**Digital implementation** Create and communicate ideas and information safely, using agreed protocols (netiquette) **Producing and implementing** Select, and safely use, appropriate components and equipment to make solutions	• Online safety protocols, including: ▪ not sharing personal information ▪ not sharing information about others ▪ responding to messages in a kind manner only ▪ checking with parents or the teacher before downloading anything ▪ telling parents or the teacher if a stranger attempts to make personal contact.	• Discuss the following questions: ▪ Who has accessed online information (e.g. internet research, watching online videos)? ▪ Who has shared information online and what for (e.g. sending emails to relatives, social media, online games)? ▪ What safety precautions should people take when online? • Complete the following online activities for personal safety and online protective measures: ▪ eSafety Commissioner – Cybersmart Detectives (https://www.esafety.gov.au/education-resources/classroom-resources/challenge/cybersmart-detectives) ▪ eSafety Commissioner – Cybersmart Forever (https://www.esafety.gov.au/education-resources/classroom-resources/challenge/cybersmart-forever).
3–4	**Digital implementation** Create and communicate ideas and information safely, using agreed protocols (netiquette) **Producing and implementing** Select, and safely use, appropriate components and equipment to make solutions	• Protocols for using digital technologies safely, including: ▪ how to safely share information online ▪ how to communicate effectively with others; for example, show respect, avoid using all capital letters ▪ copyright issues and referencing.	• Establish a set of digital citizen rules and protocols for the classroom that all students will need to abide by. • View the Young Kids Pledge (http://www.safekids.com/contract_kid/) for an example of a family online safety contract on and develop a similar pledge or contract for the classroom.
5–7	**Digital implementation** Create and communicate ideas and information safely, using agreed protocols (netiquette) **Producing and implementing** Select, and safely use, appropriate components and equipment to make solutions **Collaborating and managing** Work independently, or collaboratively when required, to plan, crate and communicate ideas and information for solutions	• Protocols for saving work at schools, including: ▪ using a folder to save work in ▪ using a naming protocol for documents. • Different types of file formats, including: ▪ images ▪ sounds.	• Superhero task: ▪ create a class blog for sharing student work online ▪ students work individually to create their own online superhero using HeroMachine 2.5™ (http://www.heromachine.com/heromachine-2-5-character-portrait-creator/), e.g. Cyber safety Sam, Private Penny, Digital Dan ▪ working in groups of four, the students create a PowerPoint to present their superheros ▪ one superhero per page ▪ add audio to describe the superhero's special powers to each slide ▪ share the presentations on the class blog. • Create a site map or tree of the students' files with naming protocols.
8–9	**Digital systems** Digital systems and peripheral devices are used for different purposes and can store and transmit different types of data	• Define 'system' and 'computer systems'. • Define peripherals; a non-essential device that is used to increase usability and function, but is not required for the operation of the system. • Digital tools (i.e. hardware used to create a solution) and peripherals (i.e. a device that can be added to a digital system but is not essential) in the classroom or school; for example: ▪ computers ▪ tablets/iPads	• Activity: Digital Technologies Hub – Peripherals (https://www.digitaltechnologieshub.edu.au/teachers/lesson-ideas/peripherals/) • Label or categorise selected peripherals into input, output or both positives and negatives of different data storage. Useful links: • Mind Meister input-output in the classroom (https://www.mindmeister.com/185152943/input-output-devices-in-the-classroom) • Code.org Curriculum Lesson 5: input and output devices (https://curriculum.code.org/csd-1718/unit1/5/)

Weeks	Syllabus content	Content unpacked	Suggested teaching and learning experiences
		▪ interactive whiteboard ▪ data projector ▪ cameras ▪ printers ▪ mobile phone. • Identify input and output devices. • How devices store data; for example: ▪ on the device itself, i.e. an internal hard-drive ▪ on a removal device, e.g. flash drive ▪ cloud based storage. • How devices transmit data; for example: ▪ tablets connected to wi-fi can send and receive information ▪ cameras connected via USB (or similar) cable can connect to computers ▪ computers connected via USB (or similar) cable to a printer.	• Crazy 4 Computers input and output devices (http://www.crazy4computers.net/input--output-devices.html).
10	**Digital systems** Digital systems and peripheral devices are used for different purposes and can store and transmit different types of data	• Digital systems involve data being sent into the computer or device that is then processed by hardware to be outputted to the user. • Peripheral devices are required for the digital system to run efficiently for the user. They consist of input devices, such as mice and keyboards, as well as output devices, such as monitors and projectors. • Storing data includes databases and spreadsheets. These can be collected from a variety of sources. Students at this level begin to understand the importance of organising stored data into categories and labels that relevant for ease of use. Hardware devices for storing data include hard drives and USBs • Transmitting data. This can be sent or received by input and output devices.	• Students complete a series of questions based on digital systems. These questions should include peripherals, data transmission, devices and computer systems. Questions should include descriptions of devices and how they transmit data (e.g. multiple-choice, matching, short answer questions).
11–12	**Representation of data** Data can be represented in different ways **Collecting managing and analysing data** Collect and present different types of data for a specific purpose using software **Evaluating** Use criteria to evaluate and justify simple design processes and solutions	• Data can be represented in many different ways using codes and symbols, such as: ▪ Morse code ▪ braille ▪ traffic signs/warning signs ▪ images (e.g. emojis). • Characteristics of popular emojis, such as: ▪ their simple design ▪ their ability to convey a clear message and/or feeling.	• Brainstorm different ways that information can be represented. • Discuss why information is sometimes presented in different formats; for example: ▪ using secret codes for privacy ▪ using braille for blind people ▪ using images to assist understanding of words ▪ using emojis to express feelings and reduce negativity. • In small groups, ask students to: ▪ make a list of five popular emojis ▪ provide reasons why they believe these emojis are so popular.
13–14	**Representation of data** Data can be represented in different ways **Collecting managing and analysing data** Collect and present different types of data for a specific purpose using software **Investigating and defining**	• Design requirements (e.g. for a storyboard) include: ▪ sketching or drawing a possible solution ▪ providing a simple rationale by annotating elements of the design. • Digital copies of images may be created in various different ways, including: ▪ creating the emoji using drawing software ▪ scanning the emoji drawn to upload to the device ▪ photographing the emoji to upload to the device.	• Individually, or in pairs, students design an emoji specifically for the school, including: ▪ developing a design idea ▪ producing a digital copy of the emoji that can be shared with others ▪ saving digital copies in a variety of formats. • Once completed, ask students to explain why they like/dislike the image software activity they used to create their emojis.

Weeks	Syllabus content	Content unpacked	Suggested teaching and learning experiences
	Identify and choose the appropriate resources from a given set **Designing** Develop and communicate design ideas and decisions using annotated drawings and appropriate technical terms **Producing and implementing** Select, and safely use, appropriate components and equipment to make solutions	• List file formats of images. • Consider what software was chosen and why?	
15–16	**Representation of data** Data can be represented in different ways **Collecting managing and analysing data** Collect and present different types of data for a specific purpose using software **Investigating and defining** Identify and choose the appropriate resources from a given set **Producing and implementing** Select, and safely use, appropriate components and equipment to make solutions	• The use of images/emojis effectively to convey a simple message may include considering questions, such as: ▪ Does the image/emoji convey a clear message/feeling? ▪ Will the image/emoji offend anyone? ▪ If using more than one image/emoji, will the order of the images make a difference to the message?	• Combine the emojis developed by the class and develop a common understanding of each emoji. • Construct a simple sentence about a school event using mainly the emojis developed by the class. • Students swap the sentence with a partner to see if they can interpret the sentence correctly. • Add various emojis and sentences to the class blog.
17–19	**Representation of data** Data can be represented in different ways **Collecting managing and analysing data** Collect and present different types of data for a specific purpose using software **Investigating and defining** Define a sequence of steps to design a solution for a given task **Collaborating and managing** Work independently, or collaboratively when required, to plan, create and communicate ideas and information for solutions	• In different ways that data can be collected and stored. The collection can be carried out by students or via research online. Students store data on databases or spreadsheets. Teacher can explore different types of storage including on devices hard drives, USBs and online (cloud). • Purpose and function of spreadsheet software; for example, MS Excel®. • Presenting data to enhance the appearance and usability, including: ▪ use of column headings, colours and shading ▪ alignment of data in cells (e.g. left for text, right for numbers, appropriate date format, etc.). • Different ways data in a spreadsheet can be treated; for example: ▪ sorting the data ▪ filtering the data ▪ adding simple formulas to perform calculations, such as: ○ adding ○ subtracting ○ multiplying ○ averaging determining minimum and maximum. • Steps to create charts (graphs) from the data.	• Students create a table that involves three different types of storage and creates a positive and negative list. Students then use this basic list to write a detailed description of one of the devices, including comparing the positives and negatives. • Students collect data to create a spreadsheet with graphs representing the data in various ways. • Students collect information about themselves and other students in the class and enter the data into a collaborative environment (e.g. Google® docs). Data may include the student's: ▪ given name ▪ gender ▪ age ▪ month of birth ▪ height ▪ eye colour. • Manipulate the data in the spreadsheet; for example: ▪ calculate the average age ▪ arrange the data in alphabetical order ▪ arrange the data in order of height and then calculate the difference between the tallest and shortest student. • Create charts/graphs to represent the data in a different format to: ▪ create a pie chart showing the gender breakdown ▪ create a bar graph to represent the month students were born. • Analyse the data in the graphs; for example: ▪ Are there more boys or girls in the class? ▪ What is the most common month for birthdays?

Weeks	Syllabus content	Content unpacked	Suggested teaching and learning experiences
20	**Investigating and defining** Define a sequence of steps to design a solution for a given task	• Following a sequence of steps occurs in many areas of everyday life; for example: ▪ baking a cake ▪ playing a board game. • Importance of following instructions carefully, and in order, to achieve the intended solution.	• Read out the instructions for the example from The Draw My Picture Game (https://www.homeschoolwithlove.com/2013/11/07/draw-picture-game/) (or similar) and have students create the image. • Compare the students' images with that from the example. • Discuss possible reasons why the images may differ. Did students: ▪ listen carefully? ▪ follow the instructions? ▪ miss some of the instructions? ▪ understand the instructions? • Add some of the images created by students to the class blog.
21–22	**Investigating and defining** Define a sequence of steps to design a solution for a given task **Collaborating and managing** Work independently, or collaboratively when required, to plan, create and communicate ideas and information for solutions	• Importance of instructions being detailed, clear and explicit. • Importance of instructions being in a specific order. • Impact if the sequence of steps is not clear or out of order. • Definition of an algorithm, i.e. a series of instructions.	• Students develop a sequence of instructions for another student to follow exactly; for example: ▪ how to make a vegemite sandwich, which is to be cut in half ▪ how to find an object or hidden treasure in the classroom or school yard.
23	**Collaborating and managing** Work independently, or collaboratively when required, to plan, create and communicate ideas and information for solutions **Evaluating** Use criteria to evaluate and justify simple design, processes and solutions	• Importance of following instructions exactly as provided. • Introduction to decisions or 'branching' in instructions. • One way and two-way decisions.	• Using the instructions developed by students in the previous lesson, give the instructions to another student to follow and evaluate the outcome; for example: ▪ Did they understand the instructions as they were presented? ▪ If they followed the instructions exactly, did they achieve the required outcome? If not, what was missing from the instructions?
24–25	**Digital implementation** Use simple visual programming environments that include a sequence of steps (algorithm) involving decisions made by the user (branching) **Investigating and defining** Identify and choose the appropriate resources from a given set **Producing and implementing** Select, and safely use, appropriate components and equipment to make solutions **Collaborating and managing** Work independently, or collaboratively when required, to plan, create and communicate ideas and information for solutions	• Description of a visual programming language. • Basic components of a visual programming language; for example: ▪ user interface ▪ sprite/characters ▪ background/world ▪ code blocks/commands.	• Hour of code activities (https://code.org/learn); for example: ▪ Make a flappy game ▪ Star Wars: Building a galaxy with code.

26–27	**Digital implementation** Use simple visual programming environments that include a sequence of steps (algorithm) involving decisions made by the user (branching) **Investigating and defining** Identify and choose the appropriate resources from a given set **Producing and implementing** Select, and safely use, appropriate components and equipment to make solutions **Collaborating and managing** Work independently, or collaboratively when required, to plan, create and communicate ideas and information for solutions	• Components of a visual programming language. • Different programming options available in the visual programming language; for example: ▪ moving characters in different directions ▪ adding sounds ▪ repeating or looping actions.	• Explore how to use a visual programming language; for example, using online tutorials from Scratch (https://scratch.mit.edu/projects/editor/?tutorial=all). • Students determine which tutorials and instructions to follow to develop programming skills in visual programming language; for example, Scratch (https://scratch.mit.edu/projects/editor/?tutorial=all).
28–30	**Investigating and defining** Define a sequence of steps to design a solution for a given task **Producing and implementing** Select, and safely use, appropriate components and equipment to make solutions	• Planning considerations for a simple animation, including defining a sequence of steps that the designer will need to follow; for example: ▪ setting or background for the animation ▪ main character/s ▪ sequence of actions for each character ▪ presentation considerations; for example, suitability for target audience.	• Plan and create a simple animation using a visual programming tool. This simple animation should be based around a topic previously studied. For example, a review of the programming game they played with screenshots or a ‘how to play guide’. • The planning should include a storyboard with the steps and sequence of how the animation will look, before the creation starts.
31	**Investigating and defining** Define a sequence of steps to design a solution for a given task **Evaluating** Use criteria to evaluate and justify simple design processes and solutions	• Evaluation criteria may include: ▪ how closely the design matched the final animation ▪ reasons for major variations, if any ▪ changes they would make in future.	• Develop a set of common criteria to evaluate animations created, including how the final product or solution matches the initial design. This can include if the ‘how to play guide’ sequence of steps were correct or differed from the design. • Students evaluate their design process and final animation using the criteria developed as a class.
32–33	**Digital implementation** Use simple visual programming environments that include a sequence of steps (algorithm) involving decisions made by the user (branching)	• Branching involves making the decision between two or more options or actions.	• Complete the activity: ‘Decision trees: Classifying animals’ (https://aca.edu.au/resources/decision-trees-classifying-animals/)
34	**Digital implementation** Use simple visual programming environments that include a sequence of steps (algorithm) involving decisions made by the user (branching) **Investigating and defining** Define a sequence of steps to design a solution for a given task **Collaborating and managing** Work independently, or collaboratively when required, to plan, create and communicate ideas and information for solutions	• Hyperlinks can be added to PowerPoint® presentations to allow the user to make decisions, i.e. branching. • Presentation considerations; for example, placement of the hyperlinks on the slides’ links style to use for hyperlinks (buttons, text, images).	• Plan and add branching to the PowerPoint created in lessons 5–7 by adding: ▪ a hyperlinked slide at the beginning of the presentation where the user selects which superhero they wish to learn more about ▪ hyperlinks on each of the superhero slides to return the selection slide (above).

35–36	**Digital implementation** Use simple visual programming environments that include a sequence of steps (algorithm) involving decisions made by the user (branching) **Investigating and defining** Define a sequence of steps to design a solution for a given task **Designing** Develop and communicate design ideas and decisions using annotated drawing and appropriate technical terms **Producing and implementing** Select, and safely use, appropriate components and equipment to make solutions **Evaluating** Use criteria to evaluate and justify simple design processes and solutions		- Sample assessment task: ‘Program my sprite’ (https://k10outline.scsa.wa.edu.au/home/assessment/assessment-activities/year4).

Note: the above Teaching and Learning outline is based on one hour per week for 36 weeks.