Assessment Planning Resources for Digital Technologies

This document supports educators in the interpretation of the Australian Curriculum: Digital Technologies F-10 Achievement Standards (Figure 1). Please note this is a **DRAFT** version. We are currently seeking educator feedback as we refine this document and build additional supporting assessment resources. If you would like to provide feedback, please contact us. The final document will be made available on the Digital Technologies Hub.

Foundation to Year 2 Achievement Standards

Learning Area Achievement Standard ⊕

Achievement Standard ⊖

By the end of Year 2, students identify how common digital systems (hardware and software) are used to meet specific purposes. They use digital systems to represent simple patterns in data in different ways.

Students design solutions to simple problems using a sequence of steps and decisions. They collect familiar data and display them to convey meaning. They create and organise ideas and information using information systems, and share information in safe online environments.

Foundation to Year 2 Work Sample Portfolios

📄 **Satisfactory**
📄 **Above Satisfactory**
📄 **Below Satisfactory**

Years 3 and 4 Achievement Standards

Learning Area Achievement Standard ⊕

Achievement Standard ⊖

By the end of Year 4, students describe how a range of digital systems (hardware and software) and their peripheral devices can be used for different purposes. They explain how the same data sets can be represented in different ways.

Students define simple problems, design and implement digital solutions using algorithms that involve decision-making and user input. They explain how the solutions meet their purposes. They collect and manipulate different data when creating information and digital solutions. They safely use and manage information systems for identified needs using agreed protocols and describe how information systems are used.

Years 3 and 4 Work Sample Portfolios

📄 **Satisfactory**

Years 5 and 6 Achievement Standards

Learning Area Achievement Standard ⊕

Achievement Standard ⊖

By the end of Year 6, students explain the fundamentals of digital system components (hardware, software and networks) and how digital systems are connected to form networks. They explain how digital systems use whole numbers as a basis for representing a variety of data types.

Students define problems in terms of data and functional requirements and design solutions by developing algorithms to address the problems. They incorporate decision-making, repetition and user interface design into their designs and implement their digital solutions, including a visual program. They explain how information systems and their solutions meet needs and consider sustainability. Students manage the creation and communication of ideas and information in collaborative digital projects using validated data and agreed protocols.

Unpacking the Digital Technologies Achievement Standard text.

Figure 1: ACARA Digital Technologies F-6 Achievement Standards

This document supports educators in interpreting the Australian Curriculum: Digital Technologies achievement standards by extracting the key text from the Australian Curriculum website and presenting it in the form of a table (Table 1). The layout of the table aligns with the layout of the Digital Technologies: Sequence of Content F-10 document (Figure 2) and can be used to support assessment planning and

the design of assessment activities. Please note, that this is not a document to replace existing Australian Curriculum documents, rather it is to support you in your interpretation of the Achievement Standards.

Digital Technologies: Sequence of content F-10 *Strand: Knowledge and understanding*

	F-2	3-4	5-6	7-8	9-10 (Elective subject)
Digital systems	Recognise and explore digital systems (hardware and software components) for a purpose (ACTDIK001)	Identify and explore a range of digital systems with peripheral devices for different purposes, and transmit different types of data (ACTDIK007)	Examine the main components of common digital systems and how they may connect together to form networks to transmit data (ACTDIK014)	Investigate how data is transmitted and secured in wired, wireless and mobile networks, and how the specifications affect performance (ACTDIK023)	Investigate the role of hardware and software in managing, controlling and securing the movement of and access to data in networked digital systems (ACTDIK034)
Representation of data	Recognise and explore patterns in data and represent data as pictures, symbols and diagrams (ACTDIK002)	Recognise different types of data and explore how the same data can be represented in different ways (ACTDIK008)	Examine how whole numbers are used to represent all data in digital systems (ACTDIK015)	Investigate how digital systems represent text, image and audio data in binary (ACTDIK024)	Analyse simple compression of data and how content data are separated from presentation (ACTDIK035)

Digital Technologies: Sequence of content F-10 *Strand: Processes and production skills*

	F-2	3-4	5-6	7-8	9-10 (Elective subject)
Collecting, managing and analysing data	Collect, explore and sort data, and use digital systems to present the data creatively (ACTDIP003)	Collect, access and present different types of data using simple software to create information and solve problems (ACTDIP009)	Acquire, store and validate different types of data, and use a range of software to interpret and visualise data to create information (ACTDIP016)	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)	Develop techniques for acquiring, storing and validating quantitative and qualitative data from a range of sources, considering privacy and security requirements (ACTDIP036) Analyse and visualise data to create information and address complex problems, and model processes, entities and their relationships using structured data (ACTDIP037)
Creating digital solutions by:					
Investigating and defining	Follow, describe and represent a sequence of steps and decisions (algorithms) needed to solve simple problems (ACTDIP004)	Define simple problems, and describe and follow a sequence of steps and decisions (algorithms) needed to solve them (ACTDIP010)	Define problems in terms of data and functional requirements drawing on previously solved problems (ACTDIP017)	Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)	Define and decompose real-world problems precisely, taking into account functional and non-functional requirements and including interviewing stakeholders to identify needs (ACTDIP038)

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Digital Technologies: Sequence of content F-10 *Strand: Processes and production skills*

	F-2	3-4	5-6	7-8	9-10 (Elective subject)
Generating and designing			Design a user interface for a digital system (ACTDIP018) Design, modify and follow simple algorithms involving sequences of steps, branching, and iteration (repetition) (ACTDIP019)	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)	Design the user experience of a digital system by evaluating alternative designs against criteria including functionality, accessibility, usability, and aesthetics (ACTDIP039) Design algorithms represented diagrammatically and in structured English and validate algorithms and programs through tracing and test cases (ACTDIP040)
Producing and implementing		Implement simple digital solutions as visual programs with algorithms involving branching (decisions) and user input (ACTDIP011)	Implement digital solutions as simple visual programs involving branching, iteration (repetition), and user input (ACTDIP020)	Implement and modify programs with user interfaces involving branching, iteration and functions in a general-purpose programming language (ACTDIP030)	Implement modular programs, applying selected algorithms and data structures including using an object-oriented programming language (ACTDIP041)
Evaluating	Explore how people safely use common information systems to meet information, communication and recreation needs (ACTDIP005)	Explain how student solutions and existing information systems meet common personal, school or community needs (ACTDIP012)	Explain how student solutions and existing information systems are sustainable and meet current and future local community needs (ACTDIP021)	Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)	Evaluate critically how student solutions and existing information systems and policies, take account of future risks and sustainability and provide opportunities for innovation and enterprise (ACTDIP042)
Collaborating and managing	Create and organise ideas and information using information systems independently and with others, and share these with known people in safe online environments (ACTDIP006)	Plan, create and communicate ideas and information independently and with others, applying agreed ethical and social protocols (ACTDIP013)	Plan, create and communicate ideas and information, including collaboratively online, applying agreed ethical, social and technical protocols (ACTDIP022)	Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)	Create interactive solutions for sharing ideas and information online, taking into account safety, social contexts and legal responsibilities (ACTDIP043) Plan and manage projects using an iterative and collaborative approach, identifying risks and considering safety and sustainability (ACTDIP044)

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Figure 2: ACARA Digital Technologies sequence of content documents
(https://acaraweb.blob.core.windows.net/resources/Digital_Technologies_-_Sequence_of_content.pdf)

The Australian Curriculum achievement standards provide a focus for teachers in initial planning and programming of teaching and learning activities (ACARA, 2010). They provide a guide for what is expected to be taught by the end of each year/band.

Teachers use the achievement standards at the end of a period of teaching, to make judgments about student learning (whether the student has achieved below, at, or above the standard). Teachers draw on assessment data they have collected as evidence during the course of the teaching period to support their judgements.

Teachers use the Australian Curriculum achievement standards and content to identify current levels of learning and achievement, and then to select the most appropriate content (possibly from across several year levels) to teach individual students and/or groups of students (ACARA, 2010). Teachers develop teaching programs designed to build on current learning. In each class, there may be students with a range of prior achievement (below, at or above the year/band level expectations).

- A indicates that a student has demonstrated **excellent achievement** of what is expected.
- B indicates that a student has demonstrated **high achievement** of what is expected.
- C indicates that a student has demonstrated **satisfactory achievement** of what is expected.
- D indicates that a student has demonstrated **partial achievement** of what is expected.
- E indicates that a student has demonstrated **limited achievement** of what is expected.

According to ACARA, F-8, jurisdictions and schools, can choose to report against the learning area achievement standard or the subject-specific achievement standard (see Figure 1). The Technologies: Sequence of achievement provides an overview of achievement across the bands for both Design and Technologies and Digital Technologies.

Part 1: Unpacking the Achievement Standards

Based on the achievement standards for the Australian Curriculum: Digital Technologies the statements of achievement have been drawn out and mapped to the threads of the knowledge and understanding strand and the processes and production skills strand. ACARA base their Achievement standards on a Level C description (satisfactory achievement).

Table 1: Digital Technologies: Sequence of Achievement Standards mapped to the threads of the (F-10) Knowledge and understanding strand

By the end of the Band, students will be able to:

	F-2	3-4	5-6	7-8	9-10 (Elective)
Digital systems	**Identify** how common digital systems (hardware and software) are used to meet specific purposes.	**Describe** how a range of digital systems (hardware and software) and their peripheral devices can be used for different	**Explain** the fundamentals of digital system components (hardware, software and networks) and how digital systems are connected to form	**Distinguish** between different types of networks and defined purposes.	**Explain** the control and management of networked digital systems and the security implications of the interaction between

		purposes.	networks. .		hardware, software and users.
Representation of data	**Use** digital systems to **represent** simple patterns in data in different ways.	**Explain** how the same data sets can be represented in different ways.	**Explain** how digital systems use whole numbers as a basis for representing a variety of data types.	**Explain** how text, image and audio data can be represented, secured and presented in digital systems.	**Explain** simple data compression, and why content data are separated from presentation.

Digital Technologies: Sequence of Achievement Standards (F-10) Strand: Processes and production skills

By the end of the Band, students will be able to:

	F-2	3-4	5-6	7-8	9-10
Collecting, managing and analysing data	**Collect** familiar data and **display** them to convey meaning.	**Collect** and **manipulate** different data when creating information and digital solutions.	**Manage** the **creation** and **communication** of ideas and information in collaborative digital projects *using validated data* and agreed protocols.	**Plan** and **manage** digital projects to **create** interactive information. **Analyse** and **evaluate** data from a range of sources to **model** and **create** solutions.	**Take account** of privacy and security requirements when selecting and validating data.
Creating digital solutions by:					
Investigating and defining	**Design** solutions to simple problems using a sequence of steps and decisions.	**Define** simple problems, design and **implement** digital solutions using algorithms that involve decision-making and user input.	**Define** problems in terms of data and functional requirements and **design** solutions by **developing** algorithms to address the problems.	**Define** and **decompose** problems in terms of functional requirements and constraints.	**Define** and **decompose** complex problems in terms of functional and non-functional requirements.
Generating and designing			**Incorporate** decision-making, repetition and user interface design into their designs and **implement** their digital solutions, including a visual program.	**Design** user experiences and algorithms incorporating branching and iterations, and **test**, **modify** and **implement** digital solutions.	**Design** and **implement** modular programs, including an object-oriented program, using algorithms and data structures involving modular functions
Producing and implementing					

					that reflect the relationships of real-world data and data entities. **Design** and **evaluate** user experiences and algorithms. **Test** and **predict** results and implement digital solutions.
Evaluating		**Explain** how the solutions meet their purposes.	**Explain** how information systems and their solutions meet needs and consider sustainability.	**Evaluate** information systems and their solutions in terms of meeting needs, innovation and sustainability.	**Evaluate** information risk, sustainability and potential for innovation and enterprise.
Collaborating and managing	**Create** and **organise** ideas and information using information systems, and **share** information in safe online environments.	**Safely use** and **manage** information systems for identified needs using agreed protocols and **describe** how information systems are used.	**Manage** the **creation** and **communication** of ideas and information in collaborative digital projects **using** validated data and agreed protocols.	**Use** appropriate protocols when communicating and collaborating online.	**Plan** and **manage** digital projects using an iterative approach. **Share** and **collaborate** online, establishing protocols for the use, transmission and maintenance of data and projects.

Part 2: Guide of assessment activities

This part of the document provides a guide for developing assessment activities based on the key active verbs in the Australian Curriculum: Digital Technologies using Bloom's Taxonomy as a framework.

Expanding on the work by [Carnegie Mellon University](), we have incorporated the key active verbs from the Australian Curriculum and have tailored sample assessment activities relevant to the Digital Technologies subject area. This table is based on Bloom's Revised Taxonomy (Anderson, Krathwohl & Bloom, 2001).

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Table 2: Key active verbs and sample activities aligned with Bloom's Taxonomy adapted from Carnegie Mellon University, based on Bloom's Revised Taxonomy (Anderson, Krathwohl & Bloom, 2001).

Bloom's (Revised) Taxonomy	Key Active Verbs as used in Achievement Standards	Sample activities	Sample assessment indicators
Remembering Retrieve relevant knowledge from long-term memory (Anderson & Krathwwohl, 2001). Recognising, Recalling.	**List**: A series of items that are related or recorded for a particular purpose (ACARA). **Recognise**: To be aware of or acknowledge and make connections (ACARA). **Identify**: Establish or indicate who or what someone or something is (ACARA).	Objective tests or assessment activities that require students to recall or recognise information. ● Fill-in-the-blank ● Multiple-choice items ● Labelling diagrams ● Reciting ● English text production: Recount, procedural recount, explanation	● Accuracy – correct vs errors, or identifying all correct elements in oral, text/visual presentation. ● Item analysis – Examining to see across the class if there are items that had higher error rates in which misconceptions or knowledge needs to be addressed in future lessons. ● Item analysis - How many different items in assessment work can students recall/recognise? Looking for the level of complexity and number of items.
Understanding Construct meaning from instructional messages, including oral, written and graphic communication (Anderson & Krathwwohl, 2001). Interpreting, Exemplifying, Classifying, Summarising, Inferring, Comparing, Explaining.	**Describe**: Give an account of characteristics or features (ACARA). **Explain**: Make (an idea or situation) clear to someone by describing it in more detail or revealing relevant facts (ACARA). **Distinguish:** Recognise point/s of difference (ACARA). **Identify**: Establish or indicate who or what someone or something is (ACARA).	Opportunities where students can share their understanding of a topic through oral, visual or written communication. ● Demonstrations ● Oral/written open test questions ● Concept maps ● Oral presentations ● Whole-class or small group focused discussion on Digital Technologies knowledge topics. ● English text production: Explanation, discussion.	● Performance rubrics that identify critical components of the required work that includes varying levels of proficiency across the components. (Teacher or student constructed rubrics). ● Peer evaluation (supported through rubrics or a criteria). ● Self-evaluation (supported through rubrics or a criteria) ● Think-aloud interviews, looking for the depth and breadth of knowledge, looking for coverage of content concepts, use of discipline language and reasoning.

Applying Carry out or use a procedure in a given situation (Anderson & Krathwwohl, 2001). Executing, Implementing.	**Represent**: Use words, images, symbols or signs to convey meaning (ACARA). **Use**: Take, hold, or deploy (something) as a means of accomplishing or achieving something; employ (Oxford University Press). **Design**: Plan and evaluate the construction of a product or process (ACARA). **Incorporate:** Take in or contain (something) as part of a whole; include (Oxford University Press). **Manipulate:** To adapt or change (ACARA). **Define:** State or describe exactly the nature, scope, or meaning of (an object), and/or mark out the boundaries or limits (Oxford University Press).	Activities that require students to use procedures to solve or complete familiar or unfamiliar tasks. This might also require students to determine which procedure(s) is most appropriate for the task at hand. ● Test/quiz questions ● Demonstrations (e.g. using a robot, or sorting data into order) ● Performances or presentations ● Prototyping Digital Technologies projects ● Programming or Computational Thinking activities (plugged and unplugged) ● Design documents (flow charts, design plans, pseudo code, symbols, storyboard) ● Posters (displaying information) ● English text production: Procedure or procedural recount	● Accuracy scores, measuring correct vs incorrect or attempts at applying knowledge and areas for improvement. ● Checklist, that identify criteria for success or skills to be demonstrated, that are checked-off. ● Rubrics, that demonstrate the level of complexity students demonstrate. ● Primary Trait Analysis (Benander et al 2000), in which a scoring rubric is used to explicitly breakdown the content criteria for assessment. Each section is given a mark, with the final grade representing a total mark for all sections. Typically used in senior years for text production and project work.
Analysing Break material into constituent parts and determine how parts relate to one another and to an overall structure or purpose (Anderson & Krathwwohl, 2001). Differentiating, Organising, Attributing.	**Sequence**: To arrange in order (ACARA). **Collect**: Bring or gather together (a number of things) (Oxford University Press). **Test:** A procedure intended to establish the quality, performance, or reliability of something, especially before it is taken into widespread use (Oxford University Press). **Distinguish:** Recognise point/s of difference (ACARA).	Activities that require students to discriminate or select relevant from irrelevant parts, determine how elements function together, or differentiate bias, values or underlying intent in presented materials. ● Debates ● Concept maps (systems thinking) ● Portfolio (collection of design works and artefact) ● Digital capture (Photo/video) of physical activities ● English text production: Discussion, exposition, review.	● Rubrics (scored by instructors, peers or self) ● External "clients", e.g. community business, industry, other class (to pitch project to) who provide feedback on the extent that solutions align with their needs. ● Primary Trait Analysis (Benander et al 2000), in which a scoring rubric is used to explicitly breakdown the content criteria for assessment. Each section is given a mark, with the final grade representing a total mark for all sections. Typically used in senior years for text production and project work.
Evaluating Make judgements based on a criteria and standards (Anderson & Krathwwohl, 2001). Checking, Critiquing.	**Evaluate**: Examine and judge the merit or significance of something (e.g. in Math, calculate; In DT, "trace", "execute") (ACARA). **Take account:** To take into consideration (Oxford University Press).	A range of activities that require students to test, monitor, judge or critique readings, performances, or products against an established criteria or standards. ● Journals/diaries, documenting testing of own or other's' work. ● Test/quiz questions ● English text production: Discussion, exposition, review ● Programming "tracing" activities, in which students read the code and determine the	● Rubrics supporting the depth of analysis that students have demonstrated in their work. ● Self- or peer-assessment, supported through Primary Trait Analysis (Benander et al 2000), in which a scoring rubric is used to explicitly breakdown the content criteria for assessment. Each section is given a mark, with the final grade representing a total mark for all sections. Typically used in

		output.	senior years for text production and project work. A scoring rubric could support self or peer evaluation. ● Checklists for signalling when students have demonstrated a skill, evaluating a design or implementation of a Digital Technologies project.
Creating Put elements together to form a coherent or functional whole; recognise elements into a new pattern or structure (Anderson & Krathwwohl, 2001). Generating, Planning, Producing.	**Share:** Post or repost (something) on a social media website or application; Tell someone about something (Oxford University Press). **Implement:** Put (a decision, plan, agreement, etc.) into effect (Oxford University Press). **Manage:** Be in charge of/run (a project) (Oxford University Press). **Collaborate:** Work jointly on an activity or project (Oxford University Press). **Create:** Bring (something) into existence (Oxford University Press). **Model:** A simplified description, especially a mathematical one, of a system or process, to assist calculations and predictions (Oxford University Press).	Opportunities for students to apply their knowledge and skills (or a context for acquiring new knowledge and skills) where they are to design and construct a solution or artefact to demonstrate learning. ● Research project portfolio ● Performances ● Design plan documents ● Digital artefact (of Maker project, App, Game, Programming Creation) ● Prototyping ● English text production: Explanation, procedure or procedural recount	● Rubrics (scored by teacher, peers or self) ● External "client" (other class, industry, community person) ● Primary Trait Analysis (Benander et al 2000), in which a scoring rubric is used to explicitly breakdown the content criteria for assessment. Each section is given a mark, with the final grade representing a total mark for all sections. Typically used in senior years for text production and project work. ● Think-aloud interviews, looking for the depth and breadth of knowledge behind their creation, looking for coverage of content concepts, use of discipline language and reasoning for using certain techniques or solutions.

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