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|  | Years 5 and 6 standard elaborations — Australian Curriculum:  Digital Technologies |

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| Purpose | The standard elaborations (SEs) provide additional clarity when using the Australian Curriculum achievement standard to make judgments on a five‑point scale. They can be used as a tool for:   * making consistent and comparable judgments about the evidence of learning in a folio of student work * developing task-specific standards for individual assessment tasks. |
| Structure | The SEs are developed using the **Australian Curriculum achievement standard**. The Digital Technologies achievement standard describes the learning expected of students at each band. Teachers use the achievement standard during and at the end of a period of teaching to make on‑balance judgments about the quality of learning students demonstrate.  In Queensland the achievement standard represents the **C standard** — a sound level of knowledge and understanding of the content, and application of skills. The SEs are presented in a **matrix**. The discernible differences or degrees of quality associated with the five-point scale are highlighted to identify the characteristics of student work on which teacher judgments are made. Terms are described in the Notes section following the matrix. |
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| Years 5 and 6 Australian Curriculum: Digital Technologies 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. | |
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| **Source** | Australian Curriculum, Assessment and Reporting Authority (ACARA), Australian Curriculum Version 8 Digital Technologies for Foundation–10, [www.australiancurriculum.edu.au/f-10-curriculum/technologies/digital-technologies](https://www.australiancurriculum.edu.au/f-10-curriculum/technologies/digital-technologies) |

## Years 5 and 6 Digital Technologies standard elaborations

|  | | A | B | C | D | E |
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|  | | The folio of a student’s work has the following characteristics: | | | | |
| Knowledge and understanding | Digital systems | comprehensive explanation of:   * the fundamentals of digital system components (hardware, software and networks) * how digital systems are connected to form networks | detailed explanation of:   * the fundamentals of digital system components (hardware, software and networks) * how digital systems are connected to form networks | explanation of:   * the fundamentals of digital system components (hardware, software and networks) * how digital systems are connected to form networks | description of:   * the fundamentals of digital system components (hardware, software and networks) * how digital systems are connected to form networks | statements about:   * the fundamentals of digital system components (hardware, software and networks) * how digital systems form networks |
| Representation of data | comprehensive explanation of how digital systems use whole numbers as a basis for representing a variety of data types | detailed explanation of how digital systems use whole numbers as a basis for representing a variety of data types | explanation of how digital systems use whole numbers as a basis for representing a variety of data types | description of how digital systems use whole numbers as a basis for representing a variety of data types | statements about digital systems using whole numbers as a basis for representing data types |
| Processes and production skills | Investigating and defining | considered definition of problems in terms of data and functional requirements | informed definition of problems in terms of data and functional requirements | definition of problems in terms of data and functional requirements | partial definition of problems in terms of data and functional requirements | fragmented definition of problems |
| Generating and designing; producing and implementing | considered design of solutions by:   * developing algorithms to address defined problems * incorporating decision‑making, repetition (iteration) and user interface design | informed design of solutions by:   * developing algorithms to address defined problems * incorporating decision‑making, repetition (iteration) and user interface design | design of solutions by:   * developing algorithms to address defined problems * incorporating decision‑making, repetition (iteration) and user interface design | partial design of solutions by developing algorithms to address defined problems | fragmented design of solutions including algorithms |
| proficient implementation of digital solutions, including a visual program | effective implementation of digital solutions, including a visual program | implementation of digital solutions, including a visual program | partial implementation of digital solutions, including a visual program | fragmented implementation of digital solutions, including a visual program |
| Processes and production skills | Evaluating | considered:   * explanation of how information systems and their solutions meet needs * consideration of sustainability | informed:   * explanation of how information systems and their solutions meet needs * consideration of sustainability | * explanation of how information systems and their solutions meet needs * consideration of sustainability | description of how information systems and their solutions meet needs | statements about how information systems meet needs |
| Collaborating and managing;  Collecting, managing and analysing data | considered management of the creation and communication of ideas and information in collaborative digital projects using validated data and agreed protocols | effective management of the creation and communication of ideas and information in collaborative digital projects using validated data and agreed protocols | management of the creation and communication of ideas and information in collaborative digital projects using validated data and agreed protocols | partial management of the creation and communication of ideas and information in collaborative digital projects using data and agreed protocols | fragmented management of the communication of ideas and information in collaborative digital projects using data and agreed protocols |

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| Key | shading emphasises the qualities that discriminate between the A–E descriptors |

## Notes

### Australian Curriculum common dimensions

The SEs describe the qualities of achievement in the two dimensions common to all Australian Curriculum learning area achievement standards — understanding and skills.

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| Dimension | Description |
| understanding | the concepts underpinning and connecting knowledge in a learning area, related to a student’s ability to appropriately select and apply knowledge to solve problems in that learning area |
| skills | the specific techniques, strategies and processes in a learning area |

### Terms used in Years 5 and 6 Digital Technologies SEs

These terms clarify the descriptors in the Years 5 and 6 Digital Technologies SEs. Definitions are drawn from the ACARA Australian Curriculum Technologies glossary ([www.australiancurriculum.edu.au/f-10-curriculum/technologies/glossary](https://www.australiancurriculum.edu.au/f-10-curriculum/technologies/glossary)) and from other sources to ensure consistent understanding.

| Term | Description | |
| --- | --- | --- |
| algorithm | the step-by-step procedures required to solve a problem;  see also [computational thinking](#computational_thinking) | |
| apply; application | use or employ in a particular situation | |
| binary | the use of two states or permissible values to represent [data](#data), such as the ON and OFF position of a light switch or the transistors in a computer silicon chip that can be in either the electrical state of ON or OFF;  typically represented as a series of single digits referred to as binary digits (or bits) due to each taking on the value of either 0 or 1;  the image below shows how a dashed line might be represented in binary  ON and OFF states for binary code  image2 | |
| collaborating and managing ([technologies process](#technologies_processes)) | creating and communicating information, especially online, by creating websites, and interacting safely using appropriate technical and social protocols;  in Years 5 and 6, students plan, create and communicate ideas and information independently and with others, using validated data and applying agreed ethical and social protocols | |
| collecting, managing and analysing data  ([processes and productions skills strand](#process_and_production_skills)) | involves the nature and properties of data, how they are collected and interpreted using a range of digital systems and peripheral devices and interpreting data when creating information  in Year 5 to Year 6, students manage, create and communicate ideas and information | |
| comprehensive | detailed and thorough, including all that is relevant | |
| computational thinking | a problem-solving method that involves various techniques and strategies that can be implemented by [digital systems](#digital_systems); techniques and strategies include organising data logically, breaking down problems into parts ([decomposing](#decompose)), defining abstract concepts, and designing and using [algorithms](#algorithm), patterns and models | |
| considered | thought about deliberately with a purpose;  in Technologies, *considered* includes [informed](#informed) |
| creation; create; creating | putting elements together to form a coherent or functional whole; reorganising elements into a new pattern or structure through designing, planning, or implementing;  *creating* requires users to put parts together in a new way or synthesise parts into something new or different to form a new product:  in Technologies, it involves bringing a solution into existence through the process of investigating and defining, generating and designing, producing and implementing, evaluating, and collaborating and managing | |
| criteria for success | a descriptive list of essential features against which success can be measured; may be predetermined, negotiated with the class or developed by students;  compilation of criteria for success involves:   * literacy skills to select and use appropriate terminology * clarifying the project task and defining the need or opportunity to be resolved | |
| critique; critiquing | a careful judgement in which opinions are given about the positive and negative aspects of something; considers good as well as bad performances, the individual parts, relationships of the individual parts and the overall performance;  see also [evaluating](#evaluating) | |
| data | the discrete representation of information using number codes;  may include characters (alphabetic, numbers, symbols), images (still and moving), sounds and instructions that can be manipulated, stored and communicated by digital systems | |
| decompose; decomposing | to separate a complex problem into parts to allow it to be more easily understood;  see also [computational thinking](#computational_thinking) | |
| defining ([technologies process](#technologies_processes)) | describes the problem and/or opportunity and states what is required of the solution | |
| description; describe | give an account of characteristics or features | |
| designing ([technologies process](#technologies_processes)) | states what is required of the solution | |
| detailed | meticulous; including many of the parts | |
| digital solution; digital solutions | the result (or output) of transforming data into information or action using [digital systems](#digital_systems), skills, techniques and processes to meet a need or opportunity;  in Digital Technologies:   * students create solutions that will use data, require interactions with users and within systems, and will have impacts on people, the economy and environments * solutions may be developed using combinations of readily available hardware and software applications, and/or specific instructions provided through programming (e.g. instructions for a robot, an adventure game, products featuring interactive multimedia including digital stories, animations and websites)   in Years 5 and 6, students create a range of digital solutions such as games, quizzes, interactive stories and animations | |
| digital systems | digital hardware and software components (internal and external) used to transform data into [digital solutions](#digital_solutions); when digital systems are connected they form a network; for example:   * a smartphone is a digital system that has software (apps, an operating system), input components (e.g. touch screen, keyboard, camera and microphone), output components (e.g. screen and speakers), memory components (e.g. silicon chips, solid state drives), communication components (e.g. SIM card,  wi-fi, bluetooth or mobile network antennas), and a processor made up of one or more silicon chips * a desktop computer with specific software and hardware components for dairy farming; the computer is connected via cables to milking equipment and via wi-fi to sensors that read tags on the cows; through these hardware components the software records how much milk each cow provides; such systems can also algorithmically control attaching milking equipment to each cow, providing feed and opening gates | |
| digital technologies | any technologies controlled using digital instructions, including computer hardware and software, digital media and media devices, digital toys and accessories, and contemporary and emerging communication technologies;  these technologies are based on instructions given using *binary* (0 or 1) code that invariably mean one or more processors are present to respond to these instructions;  computers, smartphones, digital cameras, printers and robots are all examples of digital technologies | |
| discerning | showing good judgment to make thoughtful choices;  in Technologies, *discerning* includes [informed](#informed) | |
| effective | meeting the assigned purpose in a way that produces a desired or intended result | |
| evaluate; evaluating ([technologies process](#technologies_processes)) | measures performance against established criteria; estimates the nature, quality, ability, extent or significance to make a judgment determining the value;  see also [critiquing](#critiquing);  in Digital Technologies, evaluating includes:   * solutions that have been developed by students * examining how well existing information systems meet different needs   in Years 5 and 6, students explain how student solutions and information systems meet needs and considers sustainability | |
| explanation; explain | provide additional information that demonstrates understanding of reasoning and/or application | |
| fragmented | disjointed, incomplete or isolated | |
| functional | design of products, services or environments to ensure they are fit for purpose and meet the intended need or market opportunity and identified criteria for success | |
| identification; identify | to establish or indicate who or what someone or something is | |
| implement; implementing; implementation | to put into effect by means of a plan or procedure;  in Digital Technologies, implementing a solution involves using specific software functions and items of hardware | |
| information systems | the combination of digital hardware and software components (digital systems), [data](#data), processes and people that interact to create, control and communicate information | |
| informed | having relevant knowledge; being conversant with the topic;  in Technologies, *informed* refers to the underpinning knowledge, understanding and skills of [processes and production skills](#process_and_production_skills) when solving problems and creating solutions | |
| innovation | something newly introduced; a creation (a new device or process) resulting from study and experimentation | |
| investigating and defining ([technologies process](#technologies_processes)) | describes the problem and/or opportunity and states what is required of the solution;  in Years 5 and 6, students define problems in terms of data and functional requirements | |
| iteration | repetition of a process or set of instructions in computer programming, where each repeated cycle builds on the previous; typically this uses a FOR loop command with a counter , e.g.  for number = 1 to 9  sum = sum + number | |
| partial | attempted; incomplete evidence provided | |
| plan; planning | a scheme of action or procedure; a detailed proposal for doing something | |
| processes and production skills | the skills needed to create [digital solutions](#digital_solutions);  see [technologies processes](#technologies_processes) | |
| producing and implementing ([technologies process](#technologies_processes)) | actively realising (making) digital solutions using appropriate resources and means of production;  in Years 5 and 6, students implement digital solutions as visual programs with algorithms to address defined problems, incorporating decision making, iteration and user input | |
| product; products | one of the outputs of [technologies processes](#technologies_processes), the end result of processes and production; *products* are the tangible end results of natural, human, mechanical, manufacturing, electronic or digital processes to meet a need or want | |
| proficient | competent or skilled in doing or using something;  in Digital Technologies, proficient means consistently in all digital solutions | |
| project | the set of activities undertaken by students to address specified content, involving:   * understanding the nature of a problem, situation or need * creating, designing and producing a solution to the project task * documenting the process;   a project has:   * a benefit, purpose and use * a user or audience who can provide feedback on the success of the solution * limitations to work within * a real-world technologies context influenced by social, ethical and environmental issues * [criteria for success](#criteria_for_success) to judge its success | |
| representation of data (knowledge and understanding strand) | how [data](#data) are represented and structured symbolically for use by [digital systems](#digital_systems);  in Years 5 and 6, students explain how digital systems use whole numbers (binary) as a basis for representing a variety of data types | |
| social protocols | generally accepted rules or behaviours for when people interact in online environments (e.g. using language that is not rude or offensive to particular cultures, not divulging personal details about people without their permission) | |
| statement | a sentence or assertion | |
| sustainability | supports the needs of the present without compromising the ability of future generations to support their needs | |
| technologies | the materials, data, systems, components, tools and equipment used to create solutions for identified needs and opportunities, and the knowledge, understanding and skills used by people involved in the selection and use of these | |
| technologies processes | the processes that allow the creation of a solution for an audience (end user, client or consumer) and involve the purposeful use of [technologies](#technologies) and other resources and appropriate consideration of impact when creating and using solutions;  typically require critical and creative thinking, such as computational, design or systems thinking;  in Technologies, the *technologies processes* involve:   * [investigating and defining](#investigating_and_defining) * [generating and designing](#generating_and_designing) * [producing and implementing](#producing_and_implementing) * [evaluating](#evaluating) * [collaborating and managing](#collaborating_and_managing) | |
| user | one who uses a computer, computer program, or online service | |
| visual programming | a programming language or environment where the program is represented and created visually rather than as text; a common visual metaphor represents statements and control structures as blocks that can be composed to form programs, allowing programming without having to deal with textual syntax  Note: a visual programming language should not be confused with programming languages for creating visualisations or programs with user interfaces, such as Visual Basic | |