Digital Technologies Progression Points: Year 5 v8.3

Independent Schools Queensland (ISQ) has developed Progression Points to support teachers in independent schools with implementation of version 8.3 of the Australian Curriculum.

A Word document version of the Progression Points is available so that teachers can rearrange the sequences of learning.

Personnel in independent schools are encouraged to consider how the Progression Points could be used to: -

* diagnose through formative assessment, the capabilities, strengths and weaknesses of individual students
* plan teaching programs to meet the needs of individuals and groups of students
* formally assess the progress of individuals and groups of students
* report to parents on the achievements of their children against the Australian Curriculum.

The “demonstrating” column accurately reflects the expectations of version 8.3 of the Australian Curriculum achievement standards.

ISQ welcomes any suggestions for improvement from teachers working very closely with the Progression Points.

**Digital Technologies Progression Points – Year 5**

| **Strands and content descriptions for teaching*****Modes*** | **Emerging** | **Developing** | **Demonstrating** | **Advancing**  | **Extending** |
| --- | --- | --- | --- | --- | --- |
| Beginning to work towards the achievement standard  | Working towards the achievement standard | Demonstrating the achievement standard | Working beyond the achievement standard | Extending with depth beyond the achievement standard |
| * *With explicit prompts (step-by-step oral scaffolding, reference to charts, word wall, etc)*
* *In familiar contexts*
* *Learning to follow procedures*
 | * *With prompts (oral or written questions, reference to charts, word walls, etc)*
* *In familiar contexts*
* *Attempts to explain*
 | * *Independent (with access to charts, word walls, etc.)*
* *In familiar contexts*
* *Explains basic understanding*
 | * *Independent (with access to charts, word walls, etc.)*
* *Applying in familiar contexts*
* *Explains with detail*
 | * *Independent (with access to charts, word walls, etc.)*
* *Applying in new contexts*
* *Explains with connections outside the teaching context*
 |
| **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. |
| **Content Descriptions** | Students explain the fundamentals of digital system components (hardware, software and networks) and how digital systems are connected to form networks. |
| KNOWLEDGE AND UNDERSTANDING | Examine the main [components](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=components) of common digital systems and how they may connect together to form networks to transmit [data](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=data) [(ACTDIK014)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIK014) | **With explicit prompts, students can:*** **identify** basic external components of a digital system.

*EG. Can name external components to a digital system i.e. key board, monitor, sensors, motors** **identify** internal components of a digital system.

*EG. Can name the Central processing unit** **identify** how two digital systems can be connected to form networks.

*EG. Student describes how a computer can be connected to a printer* | **With prompts, students can:*** **describe** basic external components of a digital system.

*EG. Can describe external components to a digital system and their function i.e. key board is a component that allows the user to input text data into a device** **describe** internal components of a digital system in general terms.

*EG. Can describe the central processing unit and its basic function** **describe** how two digital systems can be connected to form networks.

*EG. Student describes how a computer can be connected to a printer* | **With prompts, students can:*** **define** and **explain** basic external components of a digital system.

*EG. Can identify and explain external components to a digital system and their function i.e. key board is a component that allows the user to input text data into a device* * **define** and **explain** basic internal components of a digital system in general terms.

*EG. Can explain the function of the central processing unit** **explain** how digital systems can be connected to form networks.

*EG. Student explains how a computer can be connected to a printer through wire or wireless* | **Students can independently:*** **explain** the fundamentals of internal and external components of basic digital systems and how they can connect and transmit data.

*EG. Student can explain how a keyboard is connected to a CPU and the CPU to the screen** **explains** how digital systems can be connected variety of methods to form networks.

*EG. students explain that devices can be connected via wireless radio transmission* | **Students can individually:*** **compare** the function of alternative external components of digital systems and **evaluates** their effectiveness, using and justifying their opinion.

*EG. Compares the use of a mouse and a stylus for various activities** **recommends** methods of data transmission between digital systems based on needs and considerations.

*EG. Suggests the best way to publish/ share their work with the teacher, friend, wider audience* |
|  | Student explain how digital systems use whole numbers as a basis for representing a variety of data types. |
| KNOWLEDGE AND UNDERSTANDING | Examine how whole numbers are used to represent all [data](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=data) in digital systems [(ACTDIK015)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIK015) | **With explicit prompts, students:*** **state** that digital systems represent and transmit data using numbers.
 | **With prompts, students:*** **explain** that data in digital systems is represented in whole numbers of 1’s and 0’s (called binary digits).

*EG. Can state that computers communicate using binary (1’s and 0’s) which is why they are called “digital systems”*  | **In a familiar context, students:*** **explain** how binary representation of numbers using 1s and 0s represent the on and off electrical states.

*EG. Explains that 1’s and 0’s mean ‘off’ or ‘on’ in an electrical circuit. Can identify if something is off or on in a binary representation. Use a guide/ key to represent something in Binary.* | **Independently:*** **explains** that a Binary Digit (1,0) is a base two counting system where 8 Bits make a Byte

*EG. Recognising that the numbers 0, 1, 2 and 3 could be represented by the patterns of two binary digits of 00, 01, 10 and 11* | **Independently:*** **explains** techniques for determining binary and **represents** whole numbers in binary.

*EG. Counting in binary from zero to 15, or writing a friend’s age in binary* |
|  | Students define problems in terms of data and functional requirements and design solutions by developing algorithms to address problems. |
| PROCESSES AND PRODUCTION SKILLS | Define problems in terms of [data](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=data) and functional requirements drawing on previously solved problems [(ACTDIP017)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP017)Design a [user interface](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=user+interface) for a [digital system](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=digital+system) [(ACTDIP018)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP018) | **With explicit prompts, students:*** **list** elements of a digital solution.

*E.G Names the parts of a simple website or interface** **With support, modify** a simple user interface for a classroom application, website or game.

*EG. Student works from a design template*  | **With prompts, students:*** **explain** elements of a digital solution and how they address a problem.

*E.G Explains the purpose of a search bar on a website** **design** a simple user interface for a classroom application, website or game, (storyboard or mock up design) using a template, or example, for reference

*EG. Represents basic elements of a website design in a simple mock up or drawing* | **Independently, students can:*** **explain** how different features in a digital solution address functional needs or problems.

*EG. Describes the purpose of a website or game and identifies elements in the solution that help it achieve that purpose* * **identify** (break down) a problem into functional requirements

*EG. Students break down the functional requirements of a website in terms of basic use, ie. Home page, navigation menu** using investigations**, design** a simple user interface (storyboard or mock up design) that addresses a specific need or purpose using known digital solutions.

*EG. designing a simple webpage to display information for other children, design a simple classroom application or game, basing design on examples* | **Independently, students can:*** **investigate** digital solutions to **identify** how functional needs are met

*EG. How data is effectively communicated, what makes an interface user-friendly, elements that make an interface child friendly or easier to navigate (consider font sizes, layout, icons, use of colour, etc…)** **decompose** (break down) a problem into functional requirements (including data required)

*EG. Students break down the functional requirements of a website in terms of basic use, and identify data required, ie. the contents or elements of the navigation menu** **design** a user interface with more complex components and features to address specific needs or purposes

*EG. Adding multiple pages, site navigation and hyperlinks to a website or levels to a game* | **Independently, students can:*** **compare** a variety of digital solutions and **form opinions** about which digital solutions meets functional needs or solves problems in different situations for different people.

*EG. justifying which solutions best meets needs, highlight limitations and make suggestions for improvement** **decompose** (break down) a problem into functional requirements (including data required) and **explain** the interactivity between requirements

*EG. Students identify problems and break them down in terms of the data required and functional requirements and begin to organise the requirements logically, identifying how elements link to each other, ie. knowing where the BACK button will take the user on any given page** **design** a user interface with more complex components and features, taking greater consideration of design elements and features that make it more effective.

*EG. adding more engaging or interactive elements to a website or game, considering aesthetics, creating more dynamic content (links, pictures, videos, a more complex sitemap)* |
|  | Students incorporate decision-making, repetition and user interface design into their designs and implement their digital solutions, including a visual program. |
| PROCESSES AND PRODUCTION SKILLS | Design, modify and follow simple algorithms involving sequences of steps, [branching](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=branching), and [iteration](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=iteration) (repetition) [(ACTDIP019)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP019)Implement digital solutions as simple visual programs involving [branching](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=branching), [iteration](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=iteration) (repetition), and user [input](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=input) [(ACTDIP020)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP020) | **With explicit prompts, students:*** **use** a simple algorithm (process) to solve a problem and **explain** how it works.
* **implement** a basic algorithm using visual programming or formulas.

*EG. receives considerable support to create their algorithm, modifies an existing algorithm or produces an algorithm that performs a simple function. Does not use any ‘’if” statements or repetition)* | **With prompts, students:*** **modify the design** of a simple algorithm (process) to solve a problem and **explain** how it works.
* **implement** a basic algorithm using visual programming or formulas, using basic branching, “IF’’ statements or repeat statements

*EG. creating an simple “yes/no” guessing game or modifying a maze game in Scratch or creating an algorithm that performs simple functions that may use “if” statements or repetition* | **Independently, students can:*** **create** a simple algorithm (process) to solve a problem and **explain** how it works.
* **Implement** an algorithm using simple visual programming or formulas that may include simple branching, “IF’’ statements, or repeat statements that requires user input

*EG. programming a robot to negotiate a maze or complete an objective* | **Independently, students can:*** use a design thinking process to **create** an effective algorithm (process) to solve a problem and **explain** how it works.
* **implement** an effective algorithm using visual programming or formulas that use branching, “IF’’ statements, repeat statements that requires user input

*EG. student creates an algorithm with more effective used of controls – such as using “repeat controls” instead of just repeating algorithms over and over. They may produce a game with more than 1 objective or function. It may have greater capability for user interaction or input.* | **Independently, students can:*** use a design thinking process to independently **create** an advanced algorithm (process) to solve a problem **explain** how it works.
* **implement** an advanced algorithm using visual programing or formulas using advanced branching, “IF’’ statements, repeat statements that requires user input.

*EG. student creates an algorithm with more complexity and provides a solution with greater capabilities that can handle greater user input. They may explore some text based coding.*  |
|  | They explain how information systems and their solutions meet needs and consider sustainability. |
| PROCESSES AND PRODUCTION SKILLS | Explain how student solutions and existing information systems are [sustainable](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=sustainable) and meet current and future local community needs [(ACTDIP021)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP021) | **With explicit prompts, students:*** **identifies** a feature of a digital solution that meets a need**.**
 | **With prompts, students:*** **explain** simply how their own or other digital solutions meets a design objective

*EG. can explain the function and purpose of elements on a website or within an algorithm of their design and how it contributes towards fulfilling a need* | **Independently, students can:*** **explain** how information systems have evolved and are now more sustainable

*EG. Explain what a Wiki or blog is and what they have evolved from* | **Independently, students can:*** **explain** how digital solutions and information systems have evolved to meet user and community needs in more sustainable ways

*EG. Online library catalogues, phone directories, digital tickets using QR Codes, apps, emergency alert systems/ traffic alert systems* | **Independently, students can:*** **explain and evaluate** digital solutions and information systems have evolved to meet user and community needs in more sustainable ways

*EG. Can identify implications in relation equitable access. Considers groups of people who may be excluded as solutions evolve technologically.* |
|  | Students manage the creation and communication of ideas and information in collaborative digital projects using validated data and agreed protocols. |
| PROCESSES AND PRODUCTION SKILLS | Plan, create and communicate ideas and information independently and with others, applying agreed ethical, social and technical protocols [(ACTDIP022)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP022) | **With explicit prompts, students:*** **applies** rules for safe and acceptable use of technology in monitored situations.

*EG. Uses technology in a safe and respectful way (computer lab or when working with a device) but may require supervision in online environments.* | **With prompts, students:*** **understand** rules for safe and acceptable online practices and **applies** rules in monitored environments.

*EG. Is developing the ability to work independently in safe and acceptable ways in online environments.* | **Independently, students can:*** **explains** rules for safe and acceptable online practices and **applies** rules when working independently on digital projects

*EG. has a clear understanding of eSafety rules and practices, cyber-bullying, safe searching and identifying trustworthy websites*  | **Independently, students can:** * **explain** rules for ethical, safe and socially acceptable online practices and **applies** rules when managing independent and collaborative digital projects.

*EG. Works in safe and respectful ways when collaborating with others in online environments, following expected protocols and conventions in emails, forums, online comments and other collaborative spaces*  | **Independently, students can:*** **explain** and **justify** need for rules for ethical, safe and socially acceptable online practices and applies and monitors rules when managing independent and collaborative digital projects.

*EG. makes considerations about ownership, creative commons and copyright in digital projects, understands digital footprint and demonstrates understanding of privacy when building an online profile* |