



Progression in Computing Knowledge	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Problem Solver	<ul style="list-style-type: none"> Understand that a programmable toy can be controlled by inputting a sequence of instructions. Develop and record sequences of instructions as an algorithm. Program the toy to follow their algorithm. Debug their programs. Predict how their programs will work. 	<p>Have a clear understanding of algorithms as sequences of instructions.</p> <ul style="list-style-type: none"> Convert simple algorithms to programs. Predict what a simple program will do. Spot and fix (debug) errors in their programs. Understand what algorithms are; how they are implemented 	<ul style="list-style-type: none"> Create an algorithm for an animated scene in the form of a storyboard. Write a program in Scratch to create the animation. Correct mistakes in their animation programs. Design, write and debug programs that accomplish specific goals; solve problems by decomposing them into smaller parts. Use sequence ... in programs; work with variables and various forms of input and output. Use logical reasoning to detect and correct 	<ul style="list-style-type: none"> Develop an educational computer game using selection and repetition. Understand and use variables. Start to debug computer programs. Recognise the importance of user interface design, including consideration of input and output. Design, write and debug programs that accomplish specific goals. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. 	<ul style="list-style-type: none"> Create original artwork and sound for a game. Design and create a computer program for a computer game, which uses sequence, selection, repetition and variables. Detect and correct errors in their computer game. Use iterative development techniques (making and testing a series of small changes) to improve their game. Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by 	<ul style="list-style-type: none"> Learn some of the syntax of a text-based programming language. Use commands to display text on screen, accept typed user input, store and retrieve data using variables and select from a list. Plan a text-based adventure with multiple 'rooms' and user interaction. Thoroughly debug the program. Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.

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	<p>Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.</p> <ul style="list-style-type: none"> • Create and debug simple programs. • Use logical reasoning to predict the behaviour of simple programs. • Recognise common uses of information technology beyond school. 	<p>as programs on digital devices; and that programs execute by following precise and unambiguous instructions.</p> <ul style="list-style-type: none"> • Create and debug simple programs. • Use logical reasoning to predict the behaviour of simple programs 	<p>errors in algorithms and programs.</p> <ul style="list-style-type: none"> • Select, use and combine a variety of software ... to design and create ... content that accomplish(es) given goals, including ... presenting ... information. 	<ul style="list-style-type: none"> • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. 	<p>decomposing them into smaller parts.</p> <ul style="list-style-type: none"> • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals. 	<ul style="list-style-type: none"> • Use sequence, selection and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. Software: Python (using the IDLE editor) or trinket.io Apps: Pythonista or Python 3.4 for iOS (iOS), SL4A (Android), or trinket.io via Safari
Programmer	<ul style="list-style-type: none"> • Break down a process into simple, clear 	<ul style="list-style-type: none"> • Describe carefully what happens in 	<ul style="list-style-type: none"> • Develop a number of strategies for finding errors in programs. 	<ul style="list-style-type: none"> • Design and make an on-screen prototype of a 	<ul style="list-style-type: none"> • Be familiar with semaphore and Morse code. 	<ul style="list-style-type: none"> • Develop the ability to reason logically about algorithms.

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	<p>steps, as in an algorithm.</p> <ul style="list-style-type: none"> • Use different features of a video camera. • Use a video camera to capture moving images. • Develop collaboration skills. • Discuss their work and think about how it could be improved. • Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and 	<p>computer games.</p> <ul style="list-style-type: none"> • Use logical reasoning to make predictions of what a program will do. • Test these predictions. • Think critically about computer games and their use. • Be aware of how to use games safely and in balance with other activities. • Understand what algorithms are; how they are implemented as programs on digital devices; and that programs 	<ul style="list-style-type: none"> • Build up resilience and strategies for problem solving. • Increase their knowledge and understanding of Scratch. • Recognise a number of common types of bug in software. • Debug programs that accomplish specific goals. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. 	<p>computer-controlled toy.</p> <ul style="list-style-type: none"> • Understand different forms of input and output (such as sensors, switches, motors, lights and speakers). • Design, write and debug the control and monitoring program for their toy. • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems. • Use sequence, selection, and repetition in programs; work with various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. 	<ul style="list-style-type: none"> • Understand the need for private information to be encrypted. • Encrypt and decrypt messages in simple ciphers. • Appreciate the need to use complex passwords and to keep them secure. • Have some understanding of how encryption works on the web. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. • Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration. • Use technology safely, respectfully and responsibly; recognise 	<ul style="list-style-type: none"> • Understand how some key algorithms can be expressed as programs. • Understand that some algorithms are more efficient than others for the same problem. • Understand common algorithms for sorting and searching. • Appreciate algorithmic approaches to problems in mathematics. • Design, write and debug programs that accomplish specific goals. • Use sequence, selection and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.
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	<p>unambiguous instructions.</p> <ul style="list-style-type: none"> • Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology beyond school. • Use logical reasoning to predict the behaviour of simple programs. 	<p>execute by following precise and unambiguous instructions.</p> <ul style="list-style-type: none"> • Use logical reasoning to predict the behaviour of simple programs. • Recognise common uses of information technology beyond school. • Use technology safely and respectfully, keeping personal information private. 			<p>acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	
Logical Thinker	<ul style="list-style-type: none"> • Use the web safely to find ideas for an illustration. • Select and use appropriate painting tools 	<ul style="list-style-type: none"> • Consider the technical and artistic merits of photographs. • Use a digital camera or camera app. 	<ul style="list-style-type: none"> • Gain skills in shooting live video, such as framing shots, holding the camera steady, and reviewing. • Edit video, including adding narration and editing 	<ul style="list-style-type: none"> • Use one or more programs to edit music. • Create and develop a musical composition, refining their ideas through reflection and discussion. 	<ul style="list-style-type: none"> • Develop an appreciation of the links between geometry and art. • Become familiar with the tools and techniques of a vector graphics package. 	<ul style="list-style-type: none"> • Think critically about how video is used to promote a cause. • Storyboard an effective advert for a cause. • Work collaboratively to shoot suitable original

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	<p>to create and change images on the computer.</p> <ul style="list-style-type: none"> • Understand how this use of ICT differs from using paint and paper. • Create an illustration for a particular purpose. • Know how to save, retrieve and change their work. • Reflect on their work and act on feedback received. • Use technology purposefully to create, organise, store, manipulate and retrieve digital content. 	<ul style="list-style-type: none"> • Take digital photographs. • Review and reject or rate the images they take. • Edit and enhance their photographs. • Select their best images to include in a shared portfolio. Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology beyond school. • Use technology safely and 	<p>clips by setting in/out points.</p> <ul style="list-style-type: none"> • Understand the qualities of effective video, such as the importance of narrative, consistency, perspective and scene length. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. • Work with various forms of input and output. • Use technology safely, respectfully and responsibly 	<ul style="list-style-type: none"> • Develop collaboration skills. • Develop an awareness of how their composition can enhance work in other media. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Understand computer networks including the internet; ... and the opportunities they offer for communication and collaboration. • Be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, 	<ul style="list-style-type: none"> • Develop an understanding of turtle graphics. • Experiment with the tools available, refining and developing their work as they apply their own criteria to evaluate it and receive feedback from their peers. • Develop some awareness of computer-generated art, in particular fractal-based landscapes. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. • Select, use and combine a variety of software (including internet services) on a range of digital devices 	<p>footage and source additional content, acknowledging intellectual property rights.</p> <ul style="list-style-type: none"> • Work collaboratively to edit the assembled content to make an effective advert. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. • Use technology safely, respectfully and responsibly; recognise
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	<ul style="list-style-type: none"> Recognise common uses of information technology beyond school. Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. 	<p>respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies</p>		<p>evaluating and presenting data and information.</p> <ul style="list-style-type: none"> Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour 	<p>to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</p>	<p>acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>
Content Creator	<ul style="list-style-type: none"> Understand what algorithms are; how they are implemented as programs on digital devices; and 	<ul style="list-style-type: none"> Develop collaboration skills through working as part of a group. Develop research skills through 	<ul style="list-style-type: none"> Understand some elements of survey design. Understand some ethical and legal aspects of online data collection. Use the web to facilitate data collection. 	<ul style="list-style-type: none"> Understand different measurement techniques for weather, both analogue and digital. Use computer-based data logging to automate the recording of some weather data. 	<ul style="list-style-type: none"> Understand the work of architects, designers and engineers working in 3D. Develop familiarity with a simple CAD (computer aided design) tool. 	<ul style="list-style-type: none"> Manage or contribute to large collaborative projects, facilitated using online tools. Write and review content. Source digital media while demonstrating

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	<p>that programs execute by following precise and unambiguous instructions.</p> <ul style="list-style-type: none"> • Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or 	<p>searching for information on the internet.</p> <ul style="list-style-type: none"> • Improve note-taking skills through the use of mind mapping. • Develop presentation skills through creating and delivering a short multimedia presentation. • Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology 	<ul style="list-style-type: none"> • Gain skills in using charts to analyse data. • Gain skills in interpreting results. <p>Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.</p> <ul style="list-style-type: none"> • Understand computer networks, including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration. 	<ul style="list-style-type: none"> • Use spreadsheets to create charts • Analyse data, explore inconsistencies in data and make predictions • Practise using presentation software and, optionally, video. • Work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and 	<ul style="list-style-type: none"> • Develop spatial awareness by exploring and experimenting with a 3D virtual environment. • Develop greater aesthetic awareness. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. 	<p>safe, respectful and responsible use.</p> <ul style="list-style-type: none"> • Design and produce a high-quality print document. • Understand computer networks including the internet and the opportunities they offer for communication and collaboration. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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	<p>other online technologies.</p> <ul style="list-style-type: none"> • Recognise common uses of information technology beyond school. 	<p>beyond school.</p> <ul style="list-style-type: none"> • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies 		<p>presenting data and information.</p>		<ul style="list-style-type: none"> • Use technology safely, respectfully and responsibly.
Beyond School	<ul style="list-style-type: none"> • Use sound recording equipment to record sounds. • Develop skills in saving and storing sounds on the computer. • Develop collaboration skills as they 	<ul style="list-style-type: none"> • Understand that email can be used to communicate. • Develop skills in opening, composing and sending emails. • Gain skills in opening and 	<ul style="list-style-type: none"> • Use a search engine to learn about a new topic. • Plan, design and deliver an interesting and engaging presentation. • Search for and evaluate online images. • Create their own original images. 	<ul style="list-style-type: none"> • Understand some technical aspects of how the internet makes the web possible. • Use HTML tags for elementary mark up. • Use hyperlinks to connect ideas and sources. • Code up a simple web page with useful content. 	<ul style="list-style-type: none"> • Develop their research skills to decide what information is appropriate. • Understand some elements of how search engines select and rank results. • Question the plausibility and quality of information. 	<p>Appreciate that computer networks transmit and receive information digitally.</p> <ul style="list-style-type: none"> • Understand the basic hardware needed for computer networks to work. • Understand key features of internet communication protocols.

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	<p>work together in a group. • Understand how a talking book differs from a paper-based book. • Talk about and reflect on their use of ICT.</p> <ul style="list-style-type: none"> • Share recordings with an audience. • Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology beyond school. • Use technology 	<p>listening to audio files on the computer.</p> <ul style="list-style-type: none"> • Use appropriate language in emails. • Develop skills in editing and formatting text in emails. • Be aware of online safety issues when using email. • Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology beyond school. • Use technology 	<ul style="list-style-type: none"> • Create a video slidecast of a narrated presentation. • Develop understanding of how the internet, the web and search engines work. • Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of content that accomplish given goals, including collecting, analysing, evaluating and presenting information. 	<ul style="list-style-type: none"> • Understand some of the risks in using the web. • Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration. • Use technology safely, respectfully and responsibly; know a range of ways to report concerns and unacceptable behaviour. • Use and combine a variety of software (including internet services) to accomplish given goals, including presenting information 	<ul style="list-style-type: none"> • Develop and refine their ideas and text collaboratively. • Develop their understanding of online safety and responsible use of technology. • Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including 	<ul style="list-style-type: none"> • Develop a basic understanding of how domain names are converted to numerical IP addresses. • Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration. • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.
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	safely and respectfully.	safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	<ul style="list-style-type: none"> • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact 		collecting, analysing, evaluating and presenting data and information. <ul style="list-style-type: none"> • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. 	
Online Safety	<ul style="list-style-type: none"> • Develop basic keyboard skills, through typing and formatting text. • Develop basic mouse skills. • Use the web to find and select images. • Develop skills in storing 	<ul style="list-style-type: none"> • Sort and classify a group of items by answering questions. • Collect data using tick charts or tally charts. • Use simple charting software to produce pictograms 	<p>Develop a basic understanding of how email works.</p> <ul style="list-style-type: none"> • Gain skills in using email. • Be aware of broader issues surrounding email, including ‘netiquette’ and online safety. • Work collaboratively with a remote partner. • Experience video conferencing. • Understand computer networks, including the 	<ul style="list-style-type: none"> • Understand the conventions for collaborative online work, particularly in wikis. • Be aware of their responsibilities when editing other people’s work. • Become familiar with Wikipedia, including potential problems associated with its use. • Practise research skills. 	<ul style="list-style-type: none"> • Become familiar with blogs as a medium and a genre of writing. • Create a sequence of blog posts on a theme. • Incorporate additional media. • Comment on the posts of others. • Develop a critical, reflective view of a range of media, including text. • Understand computer networks including the internet; how they can 	<ul style="list-style-type: none"> • Research a location online using a range of resources appropriately. • Understand the safe use of mobile technology, including GPS. • Capture images, audio and video while on location. • Showcase shared media content through a mapping layer. • Understand computer networks, including the internet; how they can

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	<p>and retrieving files.</p> <ul style="list-style-type: none"> • Develop skills in combining text and images. • Discuss their work and think about whether it could be improved. Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology beyond school. • Use technology safely and respectfully, 	<p>and other basic charts.</p> <ul style="list-style-type: none"> • Take, edit and enhance photographs. • Record information on a digital map. • Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology beyond school. • Use technology safely and respectfully, keeping personal information private; 	<p>internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration.</p> <ul style="list-style-type: none"> • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact 	<ul style="list-style-type: none"> • Write for a target audience using a wiki tool. • Develop collaboration skills. • Develop proofreading skills. • Solve problems by decomposing them into smaller parts. • Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration. • Use search technologies effectively. • Use ... a variety of software (including internet services) ... to ... create ... content ... including ... presenting information. • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report 	<p>provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration.</p> <ul style="list-style-type: none"> • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. • ... be discerning in evaluating digital content. 	<p>provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration.</p> <ul style="list-style-type: none"> • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report
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	keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies	identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.		concerns about content and contact.		concerns about content and contact.
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