PROGRESSION IN COMPUTING

RATIONALE

This document outlines the subject knowledge and skill requirements for the Primary computing curriculum, incorporating EYFS, Key Stage 1 and Key Stage 2.

Progression in Computing Skills: Reception

	Keyboarding Skills	Text, Sound & Multimedia	Logo and Control	Electronic Communication	Images, Video and Animation	Data
RECEPTION	Use a mouse to rearrange objects and pictures on a screen. Begin using keyboard to add marks to the screen (adults encourage use of first fingers). Use laminated paper keyboards to help children identify alphabet	**Using drawing tools:** Using Tizzy's Tools to paint themed/topic pictures – mouse control **Sound:** Using Discovery Education tool kit to develop a simple sound sequence **Moving and assembling pictures** Discovery Education-animate a seed growing	Explore the commands needed to control a range of electronic toys. Control simple games on-screen using the arrow keys. **Understanding instructions/algorithms;** Use a variety of electronic toys in play situations, e.g., dance mats, Bee-Bots, and remote control toys, using basic directional language. Explore the commands needed to control a range of electronic toys. Beebot: give simple instructions to Bee Bot at the various levels or Daisy the Dinosaur or Light Bot Lite- iPads	Use different forms of electronic communication in free play, e.g., email, mobile phones, hand-held devices, walkie-talkies, sound recording devices. Explore simple web-based communication tools with adult support, e.g., on Discovery Education Class email to another school. Adult read and talk about contents of email Participate in simple video conferencing and webcam activities with adult help. **Foundations in computing** The Big Bus – Activities from Enchanted World. Class email to a school locally or in another country	Use Think-U-Know videos to discuss online activities –what information should we keep private online. 'Stranger danger'	At this stage, children should be made aware of everyday devices that sense data, e.g., bar codes, metal detectors, simple sound recorders, automatic doors, light sensors, stick-on thermometer strips. Collect simple data about 'Ourselves', noting eye colour, hair colour, age, shoe size etc. or favourite fruit. How many children in the class have brown eyes etc.? **Simulations and Modelling** Big Bus: Enchanted World – Bo Bear visits Friends, Sweet Maze, My First 35 Words

Progression in Computing Skills: Year 1

	Keyboarding skills	Multimedia	Programming	Internet & Email	E-Safety	Data
YEAR 1	Use a word, sound or picture bank to present ideas. Finger exercises using Tizzy's Tools to familiarise with home row, bottom row and top row keys. Use index fingers (left and right hand) on a keyboard to build words and sentences. Know when and how to use the SPACE BAR (thumbs) to make single spaces between words.	Use computing to generate ideas for their work. **Tizzy's Tools** Use various tools including brushes, pens, lines, fill, spray and stamps. Use save, retrieve, amend and print. **iPad (BookCreator)** Use iPad app to create own eBook or topic trailer link to relevant topic area. Use camera and built in video. Use the spacebar, back space, enter, shift and arrow keys. Start to use two hands when typing. Word process short texts, rather than copying up written work	**Bee Bots (app & program)** Give and follow instructions, which include straight and turning commands, one at a time to navigate other children and programmable toys around a course or a familiar journey. Explore outcomes when instructions are given in sequence. Give a simple sequence of instructions. **Bee Bots (app)** Discuss/explore what will happen when instructions are given in a sequence. Give a sequence of instructions to complete a simple task. **Tizzy's Tools** Plan, generate and follow a sequence of commands (actual and on-screen) to complete a given task or problem. Discovery Education coding	**Websites (Purple Mash & Big Bus)** Talk about websites they have been on. Explore a website by clicking on buttons, arrows, menus and hyperlinks. Navigate 'back' by clicking on the 'back' button. Complete a search under the supervision of adults. **2Email:** Learn to use email using closed email system. Give usernames and passwords allowed within the program. Send text, pictures or text and pictures. Identify key features of email program.	Use Think-U-Know to discuss online activities –what information should we keep private online. See KS1 E-Safety video folder for more videos. Make decisions about whether or not statements or images found on the internet are likely to be true. Identify different devices that can go on the internet, and separate those that do not. E.G. Xbox, Nintendo Wii Identify what things count as personal information. E.g. name, address, telephone no etc. Identify when inappropriate content is accessed and act appropriately	**Tizzy's Tools** Know that images give information. Say what a pictogram is by showing them. Put data into a program (pictogram). Collect data on: Ways we travel to school, favourite fruit, our pets Sort objects and pictures in lists or simple tables/bar graphs.

Computing Program of Study

	Keyboarding skills	Multimedia	Programming	Internet & Email	E-Safety	Data
Computing POS		KS1: use technology purposefully to create, organise, store, manipulate and retrieve digital content recognise common uses of information technology beyond school	KS1: · understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following a sequence of instructions · write and test simple programs · use logical reasoning to predict the behavior of simple programs	KS1: recognise common uses of information technology beyond school	KS1: 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.	KS1: recognise common uses of information technology beyond school

Progression in Computing Skills: Year 2

	Keyboarding Skills	Multimedia	Programming	Internet & Email	E-Safety	Data
YEAR 2	Finger exercises using Dance Mat Typing to familiarise with home row, bottom row and top row keys. Use keyboard to enter text, Use colour coded fingers to help use correct fingers (index fingers left and right hand). Complete Instruction Key, Falling letters, Falling words and 2Pop Know when and how to use the RETURN/ENTER key. Use SHIFT and CAPS LOCK to enter capital letters. Use DELETE and BACKSPACE buttons to correct text. Create sentences, SAVE and edit them later.	**Video (iMovie app): Create a trailer on Year group topic: Fire of London or other topic** Capture video. Discuss which videos to keep and why. Arrange clips to make a short film that conveys meaning on storyboard. Add simple titles and credits. Select text and make simple changes including bold, italic and underlined. Export the video **Discovery Education Coding** Plan a multi-scene animation including characters, scenes and special effects. Use 2Animate with an external camera (computer webcam) to shoot the animation frames e.g. waving hands. Adjust the number of photographs taken to improve the quality of the animation. The more photos you have the better the animation Save and retrieve animation	**Bee Bot (program or app)** Give and follow instructions, which include straight and turning commands, one at a time. Explore outcomes when instructions are given in sequence. Give a sequence of instructions to complete the 'Race Track' or locate the treasure on the 'Island'. **Discovery Education coding** Use the 'repeat' command within a series of instructions. Plan a short 'story' for a sprite and write the commands for this. Edit/refine a sequence of commands. **Tizzy's Tools (app)** Generate a sequence of instructions including 'right angle' turns. Create a sequence of instructions to generate simple geometric shapes (oblong /square). Discuss how to improve/change their sequence of commands.	**Email** Recognise an email address. Find the @ key on a keyboard. Contribute to a class email. Open and select to reply to an email as a class. Class email to a class in another school, locally, nationally or internationally.	Think-U-Know videos to discuss online activities – what information should we keep private online. Identify obviously false information in a variety of contexts. Recognise that a variety of devices (XBox, PSP etc. as well as computers and phones) connect users with other people. Identify personal information that should be kept private. Consider other people's feelings on the internet. Remember and use *Sid's Top Tips* in Lee and Kim's Animal Magic video	Place objects and pictures in a list or a simple table. Make a simple Y/N tree diagram to sort information. Create and search a simple branching database.

Computing Program of Study

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Computing POS		KS1: use technology purposefully to create, organise, store, manipulate and retrieve digital content recognise common uses of information technology beyond school	KS1: • understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following a sequence of instructions • write and test simple programs • use logical reasoning to predict the behavior of simple programs	KS1: recognise common uses of information technology beyond school	KS1: 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.	KS1: recognise common uses of information technology beyond school

Progression in Computing Skills: Year 3

	Keyboarding Skills	Multimedia	Programming	Internet & Email	E-Safety	Data
YEAR 3	Finger exercises using Dance Mat Typing to familiarise with home row, bottom row and top row keys. Sebran-ABC Rain, Letter Rain In MS Word-Alter FONT type, size and colour for emphasis and effect. Amend text and save changes. Use individual fingers, returning to home keys, to input text. Use the shift key (little finger) to type characters, such as questions marks, exclamation mark and speech marks. Drag over text to be amended. Amend text using SELECT/DELETE and COPY/PASTE.	**Graphics** Acquire, store and combine images from cameras or the internet for a purpose. Use the print screen function to capture an image. Select certain areas of an image and resize, rotate an image. Edit pictures using various tools in Paint or other photo-manipulation software. **eBooks (2Create a Story)** Create a new eBook with a front cover and add or remove pages. Combine text and images within each page, embed sound clips and simple page animation. Add information about the author and title for publishing. Get quicker at typing using both hands. Use different fonts sizes, colours and effects to communicate meaning. Align text left, right and centre.	What is an algorithm? Relate to Maths and other scenarios. Tizzy's Tools Move-Write a simple program to produce a line drawing of 2D shapes. Use more advanced features, including pen up, pen down etc. Write a program to reproduce a defined problem, e.g. geometric shape/pattern. Discovery Education Coding-Create a Simple Game What does it mean to debug a program?	**Emailing** Navigate to view their class/school blog. Understand that their class/school blog can be updated from a range of devices. Comment on their class/school blog. Subscribe with an adult's email to receive updates about their class/school blog. **Internet research** Type in a URL to find a website. Add websites to favorites e.g Google, Mathletics, Bug Club. Use a search engine to find a range of media, e.g. images, text. Think of search terms to use linked to questions they are finding the answers for. Talk about the reliability of information on the internet, e.g. the difference between fact and opinion (link to E-Safety)	Use Think-U-Know and appropriate KS2 videos e.g. Jessie and Friends to discuss E-Safety issues – safe and unsafe practices. Question the "validity" of what they see on the internet. Use a browser address bar not just search box and shortcuts. Think before sending and suggest consequences of sending/posting. Recognise online behaviours that would be unfair or unsafe.	Choose information to put into a data table. Recognise which information is suitable for their topic. Design a questionnaire to collect information. Sort and organise information to use in other ways.

Computing Program of Study

	Keyboarding Skills	Multimedia	Programming	Internet & Email	E-Safety	Data
Computing POS		KS 2 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	KS2: design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts 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	KS2: 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, ranked, and be discerning in evaluating digital content	KS2: use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	KS2: 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

Progression in Computing Skills: Year 4

	Keyboarding Skills	Multimedia	Programming	Internet & Email	E-Safety	Data
YEAR 4	Finger exercises using Dance Mat Typing to familiarise with home row, bottom row and top row keys. Sebran- ABC Rain and Letter Rain to improve speed on keyboard. In MS Word- Use font sizes and effects such as bullet points appropriately. Use CUT, COPY and PASTE to organise and reorganise text on screen. Edit text using DELETE, INSERT and OVERWRITE as appropriate. Drag over and move text. Know how to use a spellcheck. Use individual fingers, returning to home keys, to input text. Use the shift key (little finger) to type characters such as £ ( ) + Input numbers using individual fingers, returning to home keys.	**MS PowerPoint** Plan what they would like to happen in their slide show. – Topic related - Tudors Use characters and relevant text in program to create show. Take own series of pictures to add to backgrounds to form modern day Tudor animation. Move items within their show using transitions and animation to create movement on playback. Edit/improve their show. **Sound Recording (Audacity)** Collect audio from a variety of sources including own recordings and internet clips. Create a multi-track recording using effects. Edit and refine their work to improve outcomes. Create your own Newspaper http://www.brainboxx.co.uk/a4_resource/pages/history/TUDORS.htm http://www.bbc.co.uk/cbbc/clips/p019gbdl	**2DIY** Navigate the 2DIY environment. Choose game according to ability, Quiz, Multi Choice, Create a background and sprite for a game. Add inputs to control their sprite. Use conditional statements (if… then) within their game. **Discovery Education Coding** Create a 3D digital world for a game with land, water and scenery. Add a sprite to their world. Program their sprite to navigate their 3D world with an input. Debug errors in the program Use conditional statements ('if…then') to create dangerous items in their world.	**Emails** Log in to 2email, open emails, create and send replies. Attach files to an email. Download and save files from an email. Email more than one person and participate in group emails by 'replying to all'. **Unit 2: Video conferencing** Teacher load and add a contact to Skype for Education. Class make/receive and voice and video call. Adjust the audio/video settings to ensure good quality of the call.	Use Think-U-Know and KS2 videos to discuss themes in the videos http://www.bbc.co.uk/cbbc/clips/p01g2pt6 Newsround: Caught in the Web: http://www.youtube.com/watch?v=kgCNGvL0g1g Lily's Story Recognise social networking sites and social networking features built into other things (such as online games and handheld games consoles e.g. Xbox). Make judgements in order to stay safe, whilst communicating with others online. Tell an adult if anything worries them online. Identify dangers when presented with scenarios, social networking profiles, etc. Articulate examples of 'good' and 'bad' behaviour online.	Create and search a branching database. Sort and organise information to use in other ways. Create own branching database from information individual or teacher has selected.

Computing Program of Study

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Computing POS		KS 2 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	KS2: design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts 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	KS2: 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	KS2: use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	KS2: 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

Progression in Computing Skills: Year 5

	Keyboarding Skills	Multimedia	Programming	Internet & Email	E-Safety	Data
YEAR 5	Timed finger exercises using Dance Mat Typing to familiarise with home row, bottom row and top row keys. Sebran- to increase speed on keyboard. In MS Word- Use individual fingers, returning to home row keys, to input text. Use the understanding of the editing tools of a text handling program to write different versions and genres of texts. Use knowledge of text marking/editing to extract key points from texts. Use the shift key (little finger) to type characters as needed. Input numbers using individual fingers, returning to home keys. Complete dictation exercise	**eBooks-Book Creator** Create a new ebook with a front cover and add/remove pages/sub pages. Produce a multimedia ebook combining video, pictures, text hyperlinks and audio Attach author data for publishing and publish book. **Digital Film Making- IMovie** Capture video using Flipcams or similar. Discuss which videos to keep and why. Arrange clips to make a short film that conveys meaning on storyboard. Add simple titles and credits. Select text and make changes including bold, italic and underlined. Add subtitles or own narration Export/ save the slideshow the video	**Discovery Education Coding** Create a challenging sea game using inputs and outputs to control an object's properties. Create and edit variables – including speed, direction and co-ordinates. Use conditional statements by creating a pinball game. Write code that uses random number generation to change speed and headings.	**Internet research** Use advanced search functions in Google, e.g. quotations. Understand websites such as Wikipedia are made by users (link to E-Safety) Use strategies to check the reliability of information, e.g. cross checking with books. Use their knowledge of domain names to aid their judgment of the validity of websites. **Cloud computing** Understand files may be saved off their device in 'clouds' (servers: e.g Dropbox, Fronter, Purple Mash). Upload/download a file to the cloud on different devices. Understand about syncing files using cloud computing folders.	Use KS2 videos to discuss themes in the videos: Consequences, http://www.bbc.co.uk/cbbc/clips/p00nxznx (Guy Fawkes- Internet Privacy Settings) http://www.bbc.co.uk/cbbc/clips/p01g2pg0 (Saxon Monk- Internet Videos forever) http://www.bbc.co.uk/cbbc/clips/p01g2ppl (Lady Jane Grey- Beware of What you Download) CEOP: Tom's (boy) video Judge what sort of privacy settings might be relevant to reducing different risks. Judge when to answer a question online and when not to. Be a 'good online citizen and friend', not a' digital bystander'. Articulate what constitutes good behaviour online. Find and cite the web address for any information or resource found online. Use different sources to double check information found.	**Using Spreadsheets** Create data collection forms and enter data from these accurately. Know how to check for and spot inaccurate data. Know which formulas to use when I want to change my spreadsheet model. Make graphs from the calculations on my spreadsheet.

Computing Program of Study

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Computing POS		KS 2 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	KS2: design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts 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	KS2: 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	KS2: use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	KS2: 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

Progression in Computing Skills: Year 6

	Keyboarding skills	Multimedia	Programming	Internet & Email	E-Safety	Data
YEAR 6	Timed finger exercises using Dance Mat Typing to familiarise with home row, bottom row and top row keys. In MS Word or MS Publisher - Use individual fingers, returning to home keys, to input text. Use the understanding of the editing tools of a text handling program to write different versions and genres of texts. Use knowledge of text marking/editing to extract key points from texts. Use the shift key (little finger) to type characters as needed. Input numbers using individual fingers, returning to home keys. Complete dictation exercise in Dance Mat Typing level 12.	**Film making (IMovie/ Windows Movie Maker)** Storyboard and capture videos for a purpose. Plan for the use of special effects/transitions to enhance their video. Import footage to IMovie/Movie Maker for more advanced editing. Trim, arrange and edit audio levels of video to improve the quality of their outcome. Add titles, credits, transitions, special effects. Export their video in different formats for different purposes Year Book Creation- write personal text, Add photos, individual and group	**Scratch *Temple Run*** Design their own game including sprites, backgrounds, scoring and/or timers. Their game uses conditional statements, loops, variables and broadcast messages. Their game finishes if the player wins or loses and the player knows if they have won or lost. Evaluate the effectiveness of their game and debug if required. ***Discovery Education Coding*** Expand on knowledge of variables and use them to change the properties of shapes on screen. Use Booleans to make a stopwatch. Combine knowledge of co-ordinates, conditional events, random numbers and variables to create a game. Develop understanding of object properties e.g. friction and how to pass properties from the pointer to an object. Create a golf simulation game, consisting of several holes.	**Searches** From given websites find information to answer a specific question(s). Develop key questions to search for specific information and begin to refine search criteria based on results. Be aware of the opportunities that the internet provides for publishing, learning and collaborating. (Links to e-Safety Search – examples: 1.http://www.rocksforkids.com/WebQuest/VolcanoWebQuest.html 2. The children's war – Imperial war museum webquest 3.Http://www.questgarden.com – examples and create. Select suitable information and make simple judgments about sources of information selecting a url and navigate to their webquest once it is created.	Use KS2 videos to discuss themes in the videos: Consequences, http://www.bbc.co.uk/cbbc/clips/p00nxznx (Guy Fawkes- Internet Privacy Settings) http://www.bbc.co.uk/cbbc/clips/p01g2pg0 (Saxon Monk- Internet Videos forever) http://www.bbc.co.uk/cbbc/clips/p01g2ppl (Lady Jane Grey- Beware of What you Download) CEOP: Tom's (boy) video Find *report* and *flag* buttons in commonly used sites and name sources of help (Childline, Cybermentors, etc) 'click-CEOP' button and explain to parents what it is for. Write explanation in own word. Discuss 'plagerism' Discuss scenarios involving online risk.	**Using Spreadsheet Models** Create data collection forms and enter data from these accurately. Know how to check for and spot inaccurate data. Know which formulas to use when I want to change my spreadsheet model. Make graphs from the calculations on my spreadsheet. Sort and filter information. Understand that changing the numerical data effects a calculation.

Progression in Computing Skills: Year 6 (continued)

		Keyboarding Skills	Multimedia	Programming	Internet & Email	E-Safety		Data
Computing POS					Alter the theme and appearance of their blog, adding background images etc. Create a new webquest, save it as a draft and re-edit it. Embed photos, hyperlinks and videos into webquests. How do we know the websites are reliable? Discuss the merits of visiting numerous websites as is in a webquest. http://www.npg.org.uk/webquests/ National Portrait Gallery webquests	State the source of information found on the internet. Act as a role model for younger pupils, including promoting Jessie and friends advice from Think-U-Know		

Computing Program of Study

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Attainment target Levels

Band 1
Pupils explore information from various sources, showing they know that information exists in different forms. They use computers to work with text, images and sound to help them share their ideas. They recognise that many everyday devices respond to signals and algorithms/instructions. They make choices when using such devices to produce different outcomes. They talk about their use of computing.

Band 2
Pupils use computing to organise and classify information and to present their findings. They enter, save and retrieve work. They use computing to help them generate, amend and record their work and share their ideas in different forms, including text, tables, images and sound. They plan and give algorithms/instructions to make things happen and describe the effects. They use computing to explore what happens in real and imaginary situations. They talk about their experiences of computing both inside and outside school.

Band 3
Pupils use computing to save information and to find and use appropriate stored information, following straightforward lines of enquiry. They use computing to generate, develop, organise and present their work. They share and exchange their ideas with others. They use sequences of algorithms/ instructions to control devices and achieve specific outcomes. They make appropriate choices when using computing based models or simulations to help them find things out and solve problems. They describe their use of computing and its use outside school.

Band 4
Pupils understand the need for care in framing questions when collecting, finding and interrogating information. They interpret their findings, question plausibility and recognise that poor quality information leads to unreliable results. They add to, amend and combine different forms of information from a variety of sources. They use computing to present information in different forms and show they are aware of the intended audience and the need for quality in their presentations. They exchange information and ideas with others in a variety of ways, including using email. They use computing systems to control events in a predetermined manner and to sense physical data. They use computing based models and simulations to explore patterns and relationships, and make predictions about the consequences of their decisions. They compare their use of computing with other methods and with its use outside school.

Band 5

Pupils select the information they need for different purposes, check its accuracy and organise it in a form suitable for processing. They use computing to structure, refine and present information in different forms and styles for specific purposes and audiences. They exchange information and ideas with others in a variety of ways, including using email and video conferencing. They create sequences of algorithms/instructions to control events, and understand the need to be precise when framing and sequencing instructions. They understand how computing devices with sensors can be used to monitor and measure external events. They explore the effects of changing the variables in a computing based model. They discuss their knowledge and experience of using computing and their observations of its use outside school. They assess the use of computing in their work and are able to reflect critically in order to make improvements in subsequent work.

Band 6

Pupils develop and refine their work to enhance its quality, using information from a range of sources. Where necessary, they use complex lines of enquiry to test hypotheses. They present their ideas in a variety of ways and show a clear sense of audience. They develop, try out and refine sequences of algorithms/ instructions to monitor, measure and control events, and show efficiency in framing these instructions. They use computing based models to make predictions and vary the rules within the models. They assess the validity of these models by comparing their behaviour with information from other sources. They discuss the impact of computing on society.