North Petherwin and Werrington

Computing Knowledge and Skills Organiser

Purpose of Study

As Computing underpins today's modern lifestyle, we believe it is essential that all pupils gain the confidence and ability, that they need in this subject, to prepare them for the challenge of a rapidly developing and changing technological world. Computing has deep links with mathematics, science, SMSC and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

The national curriculum for computing aims to ensure that all pupils:

- **can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation**
- **can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems**
- **can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems**
- **are responsible, competent, confident and creative users of information and communication technology.**

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study. This knowledge and skills organiser for computing demonstrates the progression through the year groups. It includes regular opportunities to revisit prior learning and build upon this.

We use the Just2Easy scheme to support our teaching and learning in Computing.

Capabilities Curriculum

The Capabilities Curriculum is a creative curriculum which measures social and emotional capabilities which improve children's learning, valuing the development of the whole child and preparing them for the future.

An Daras Trust have chosen to adopt a curriculum framework informed by pupil's social and emotional well-being. The class capability scores are used to inform a teachers approach to the lesson, which will help growth in these valuable characteristics.

These capabilities are evidenced as being necessary for future success, and by measuring them we are placing real value on them.

There are 7 capability strands: Managing feelings, Confidence, Communication, Relationships and Leadership, Planning and Problem-Solving, Creativity, Resilience and Determination.

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Diversity: we have carefully planned our curriculum to include diversity (gender, disability, BAME – Black, Asian and Minority Ethnic) to ensure it is a diverse and inclusive curriculum.

Visible Learning (metacognition)

Metacognition describes the processes involved when learners plan, monitor, evaluate and make changes to their own learning – the thinking about their thinking. Pupils are given opportunity to understand their own cognitive abilities, knowledge of tasks and strategies that could be used to support their learning. Pupils are also encouraged to self-reflect. The following questions will be used to deepen pupils understanding of their learning:

Visible Learning	Surface Learning Strategies		Deep Learning Strategies		Transfer Learning Strategies	
	Do I know what I need to do to complete my task? Can I plan and organise my learning before I start? Where am I with my learning? How well have I achieved my success criteria? What is my next step? I can seek feedback from others to help me in my next steps.		Can I explain my learning to someone else? I know and can explain what strategies I have used in my learning. I can make links between new content and ideas and learning I already know. I can share my ideas and questions to deepen my understanding. I know how I did at the end of my learning. I can explain how things link together.		Can I organise my knowledge to support new learning? I can look for and recognise similarities and differences in my tasks. I can organise my knowledge to support new learning. When have I applied my learning to another area? I know where I am heading in my learning. I understand what I am learning, where I am going and how to get there. I know what success looks like.	
EYFS	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
	30 – 50 Months		**40 – 60 Months**		**Early Learning Goal (ELG)**	
Knowledge	**Understanding The World** **Technology** ▪ To know how simple equipment operates. ▪ To show an interest in technological toys with knobs or pulleys, or real objects.		**Understanding The World** **Technology** ▪ To understand how to program a simple program on a computer.		**Understanding The World** **Technology** ▪ To understand that a range of technology is used in places such as homes and schools. ▪ To understand that technology can be used for particular purposes.	

	▪ To understand that some toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images. ▪ To know that information can be retrieved from computers.		
Skill Progression	**Understanding The World** **Technology** ▪ Know how to operate simple equipment. ▪ Show an interest in technological toys with knobs or pulleys, or real objects. ▪ Show skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images.	**Understanding The World** **Technology** ▪ Program a simple program on a computer. ▪ Interact with age-appropriate computer software.	**Understanding The World** **Technology** ▪ Recognise that a range of technology is used in places such as homes and schools. ▪ Select and use technology for particular purposes.
Metacognition	**Planning**	**Monitoring**	**Evaluation**
	What resources do I need to carry out my task? **Can I describe what I am going to do?** **How can I link my learning with my own experiences to help me?**	**Am I doing well?**	**How did I do?** **Am I able to re-tell stories and link them to other areas of learning?**

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Class 2 Year 1,2,3 Year A	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Concept And Knowledge	**Computing: We are Treasure Hunters Online Safety: We are online rule writers. Unit 1.1 - Using Programable Toys Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs. Recognise common uses of information**	**Computing: We are TV Chefs Online Safety: We are Kind and Thoughtful Unit 1.2 - Filming the Steps of a Receipe Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Use logical reasoning to predict the behaviour of simple programs. Use technology purposefully to create, organise,**	**Computing: We are Painters Online Safety: We are Responsible Internet and Device Users Unit 1.3 - Illustrating an Ebook 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; identify where to go for help and support when they have concerns about content or contact**	**Computing: We are Collectors Online Safety: We are Information Protectors Unit 1.4 - Finding images using the Web Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Recognise common uses of information technology beyond**	**Computing: We are Story tellers Online Safety: We are Digital Good Citizens Unit 1.5 - Producing a Talking Book Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Recognise common uses of information technology beyond school.**	**Computing: We are Celebrating Online Safety: We are Responsible Gamers Unit 1.6 - Creating a Card Digitally 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; identify where to go for help and support when they have concerns**

	technology beyond school.	**store, manipulate and retrieve digital content.** **Recognise common uses of information technology beyond school**	**on the internet or other online technologies.**	**school.**		**about content or contact on the internet or other online technologies**
Skills Progression	**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 programmes** **Predict how their algorithms will work**	**break down a process into simple, clear steps,** **as in an algorithm** **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.**	**use the web safely to find ideas for an illustration** **select and use appropriate painting tools to create** **and change images on the computer** **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.**	**find and use pictures on the web** **know what to do if they encounter pictures that cause concern** **group images on the basis of a binary (yes/no)** **question** **organise images into more than two groups according to clear rules** **sort (order) images according to some criteria** **ask and answer binary (yes/no) questions about** **their images.**	**Use the web safely to find ideas for an illustration** **Select and use appropriate painting tools to create and change images on the computer** **Understand how this use of IT 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**	**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 and retrieving files** **develop skills in combining text and images** **discuss their work and think about whether it could** **be improved.**

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On-line Safety Skills	**Understand that rules help us stay safe both in the real world and online** **Suggest strategies for staying safe online** **Develop a set of on-line safety rules that are easily understood for KS1 pupils**	**Understand that unkind on-line behaviour can affect others, even though we can't always see them** **Understand that on-line safety rules can be applied to different on-line situations**	**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**	**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 technologiesknow is in real life a stranger** **Understand how we can protect our personal information -reporting worries to trusted adults**	**Use technology safely and respectfully**	**Understand the importance of playing games in shared spaces where a trusted adult is available for support** **Understand the importance of taking breaks away from games**
Resource	**Software: Programming interface for programmable toy** **Apps: Bee-Bot app, Daisy the Dinosaur, Blue-Bot app** **Hardware: Programmable toy, such as a Bee-Bot or Roamer** **Too. Audio recorders**	**Software: iMovie/WeVideo** **Apps: Brushes Redux, iMovie** **Hardware: Computers, cameras with movie mode/tablets** **Outcome: A short video showing how to make a simple**	**Software: Tux Paint/Microsoft Paint/2Simple 2Paint A Picture/Fresh Paint, IWB software, Microsoft Word®, Microsoft PowerPoint®** **Apps: Brushes Redux, SketchBook Express** **Hardware: Laptop/desktop**	**Software: Web browser, Microsoft PowerPoint® or IWB software** **Apps: Web browser, Keynote or Explain Everything** **Hardware: Internet connection, laptop/desktop computers**	**Software: Microsoft PowerPoint®/2Create A Story/IWB software** **Apps: Keynote/Explain Everything/Book Creator** **Hardware: Computers/tablets, MP3 recorders/microphones**	**Software: Microsoft PowerPoint®/Microsoft Word®/Clicker 7, Microsoft Paint/2Paint A Picture/Fresh Paint** **Apps: Pages/Keynote, Brushes Redux/Sketchbook Express** **Hardware: Laptops/computers/ta**

	are needed for the first step (a smartphone or tablet would be sufficient) Outcome: A sequence of instructions that will move a programmable toy along a given route	**meal or snack**	**computers or tablets Outcome: A piece of electronic artwork to illustrate a traditional tale, collated into an eBook**	**Outcome: A number of presentation slides, each with different collections of animals, organised according to rules**	**Outcome: A talking book**	**blets, printer Outcome: A greetings card created digitally, which combines an image with text**
Class 2 Year 1,2,3 Year B	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Concept And Knowledge	**Computing: We are Astronauts Online Safety: We are Rule Writers** **Unit 2.1 Programming on-screen** **Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous**	**Computing: We are Game Testers Online Safety: We are not Online Bullies** **Unit 2.2 Exploring How Computer Games Work** **Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and**	**Computing: We are Photographers Online Safety: We are Safe Searchers** **Unit 2.3 Taking better Photos** **Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Recognise common uses of information technology beyond school. Use technology safely**	**Computing: We are Researchers Online Safety: We are Code Masters** **Unit 2.4 Researching a Topic** **Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Recognise common uses of information technology beyond school. Use technology safely**	**Computing: We are Detectives Online Safety: We are On-line Behaviour Experts** **Unit 2.5 Collecting Clues** **Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Recognise common uses of information technology beyond school.**	**Computing: We are Zoologists Online Safety: We are Game Raters** **Unit 2.6 Collecting Data about Bugs** **Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Recognise common uses of information technology beyond**

	instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs.	unambiguous instructions. Use logical reasoning to predict the behaviour of simple programs. Recognise common uses of information technology beyond school.	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.	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	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.	school.
Skill Progression	This unit will enable the children to: have a clear understanding of algorithms as sequences of instructions convert simple algorithms to programs predict what a simple program will do spot and fix (debug) errors in their programs.	This unit will enable the children to: describe carefully what happens in computer games 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.	This unit will enable the children to: consider the technical and artistic merits of photographs use a digital camera or camera app take digital photographs review and reject or pick the images they take edit and enhance their photographs select their best images to include in a shared portfolio.	This unit will enable the children to: develop collaboration skills through working as part of a group develop research skills through searching for information on the internet improve note-taking skills through the use of mind mapping develop presentation skills through creating and delivering a short	understand that email can be used to communicate develop skills in opening, composing and sending emails gain skills in opening and listening to audio files on the computer use appropriate language in emails develop skills in editing and formatting text in emails be aware of online	This unit will enable the children to: 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 and other basic charts take, edit and enhance photographs record information on a digital map.

				multimedia presentation.	safety issues when using email.	
On-line Safety Skills	**Consider on-line safety scenarios encountered at KS1 – at school and at home and how they may need to adapt any online safety rules they know about** **Consider - strategies they might use on-line if usual trusted adult is not available**	**Use technology safely and respectfully, keeping personal information private.**	**Review basic principles of how search engines work** **Revise and use the Key Steps for searching the web safely**	**Demonstrate how we can protect personal information on-line** **Recognise the difference between strong and weak password**	**Understand how the way we use technology may impact on the people around us** **Review practical responses to incidents of poor behaviour on-line**	**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.**
Resource	**Software: Scratch, Kodu** **Apps: Hopscotch, Daisy the Dinosaur, Scratch Jr, Pyonkee** **Hardware: Programmable toy, such as a Bee-Bot or Roamer Too** **Outcome: A Scratch (or similar) program in which a sprite moves around the screen**	**Software: Scratch, Screencast-o-matic, web-based or open source games, pupils' games, Snap!** **Apps: Pyonkee, free game apps, Light-bot** **Hardware: Desktop/laptop computers, IWB, internet connection; optionally, MP3 recorders, pupils' own game consoles**	**Software: Microsoft Photos, Pixlr** **Apps: Photos (iOS), Snapseed** **Hardware: Desktop or laptop computers and digital cameras/ tablets/smartphones** **Outcome: A class portfolio of original photographs**	**Software: FreeMind, bubbl.us, Google Custom Search, web browser, Microsoft PowerPoint®** **Apps: iThoughtsHD, Safari, Keynote, Popplet Lite, bubbl.us** **Hardware: Laptop or desktop computers or tablets, internet connection** **Outcome: Mind maps and a two-minute multimedia**	**Software: Your school's email system, Microsoft Excel®, Google Sheets** **Apps: Mail, Numbers, Google Sheets** **Hardware: Desktop or laptop computers or tablets; network access** **Outcome: Class emails requesting information to solve a mystery**	**Software: Microsoft Excel®/IWB software, Picasa/Microsoft Photos, Google My Maps/Google Earth** **Apps: Numbers, Google Sheets, Snapseed, RunKeeper** **Hardware: Desktop or laptop computers with digital cameras/tablets, internet connection** **Outcome: Charts and maps showing bugs**

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		Outcome: Notes on how games work, as text, audio or screencast video		**presentation for a specific audience**		**found in different locations**
Metacognition	**Planning**		**Monitoring**		**Evaluation**	
	What resources do I need to carry out my task? Have I done anything like this before? How can I link my learning with my own experiences to help me?		**Am I doing well? Do I need any different techniques to improve my learning/task?**		**Am I able to re-tell stories and link them to other areas of learning? How did I do in my task?**	
Class 2 Year 1,2,3 Year C	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Concept And Knowledge	**Computing: We are Programmers Online Safety: We are Rule Writers Unit 3.1 Programming an Animation Design, write and debug programs that accomplish specific goals; solve problems by decomposing them into smaller parts. Use sequence … in**	**Computing: We are Bug Fixers Online Safety: We are Digital Friends Unit 3.2 Finding and Correcting Bugs in Programs Debug programs that accomplish specific goals. Use sequence, selection, and repetition in programs; work with variables and various forms of**	**Computing: We are Presenters Online Safety: We are Internet Detectives Unit 3.3 Videoing Performance 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**	**Computing: We are Vloggers Online Safety: We are aware of our Digital Footprint Unit 3.4 Masking and Sharing a Screencast Presentation nderstand computer networks including the internet; how they can provide multiple services, such as the world wide web. Use search technologies**	**Computing: We are Communicators Online Safety: We are 'Netiquette' Experts Unit 3.5 Communicating Safely on the Internet Understand computer networks, including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for**	**Computing: We are Opinion Pollsters Online Safety: We are Avatar Creators Unit 3.6 Collecting and Analysing Data 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**

	programs; work with variables and various forms of input and output. Use logical reasoning to detect and correct errors in algorithms and programs. Select, use and combine a variety of software … to design and create … content that accomplish(es) given goals, including … presenting … information.	**input and output. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.**	**goals, including collecting, analysing, evaluating and presenting data and information. Work with various forms of input and output. Use technology safely, respectfully and responsibly.**	**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.**	**communication and collaboration. 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.**	**that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. 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.**
Skill Progression	**This unit will enable the children to: create an algorithm for**	**This unit will enable the children to: develop a number of**	**This unit will enable the children to: gain skills in shooting**	**This unit will enable the children to: use a search engine to**	**This unit will enable the children to: develop a basic**	**This unit will enable the children to: understand some**

	an animated scene in the form of a storyboard write a program in Scratch to create the animation correct mistakes in their animation programs	strategies for finding errors in programs 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.	live video, such as framing shots, holding the camera steady, and reviewing edit video, including adding narration and editing clips by setting in/out points understand the qualities of effective video, such as the importance of narrative, consistency, perspective and scene length.	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 create a screencast video of a narrated presentation develop their understanding of how the internet, the web and search engines work.	understanding of how email works 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.	elements of survey design use the web to facilitate data collection gain skills in using charts to analyse data gain skills in interpreting results.
On-line Safety Skills	Consider on-line safety scenarios encountered at KS1 – at school and at home and how they may need to adapt any online safety rules they know about Consider - strategies they might use on-line if usual trusted adult is not available	Begin to understand the concept of 'on-line' bullying and the role of the bystander Develop an understanding of the consequences of on-line bullying	Use technology safely, respectfully and responsibly.	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	understand some ethical and legal aspects of online data collection
Resource	Scratch (recor PowerPoint®, Scratch Jr	Software: Scratch/Snap!, Screencast-o-matic (if appropriate)	Software: iMovie/WeVideo/Kinovea/Dartfish Apps: iMovie/Coach's	Software: Google, Creative Commons search engines, PowerPoint®/Google	Software: Email system (your school's own system, Gmail or another system),	Software: Web browser, Google Forms, Google Sheets and Google

	Hardware: Laptop or desktop computers (recommended) or tablets, cameras (optional), microphones (optional) **Outcome: A short, scripted, animated cartoon**	**Apps: Snap! in the web browser** **Hardware: Laptop/desktop computers, microphone (if appropriate)** **Outcome: Debugged Scratch scripts and explanatory screencasts (if appropriate)**	**Eye** **Hardware: Digital cameras, flip cameras (or similar), tablet computers/iPod Touch or similar** **Outcome: One minute of edited video of children performing an activity, with narrated commentary**	**Presentation, Screencast-O-Matic/QuickTime Player** **Apps: Safari, Explain Everything™, Adobe Voice** **Hardware: Laptops, desktop PCs with microphones, tablet computers** **Outcome: A screencast video of a short narrated presentation on an agreed topic, combining images and audio**	**video conferencing software (Skype, Google Hangouts or Janet video conferencing), presentation software** **Apps: Skype, FaceTime, Hangouts** **Hardware: Webcam and speakers** **Outcome: Emails (both collective and individual), collaborative presentation, video conference**	**Slides/InspireData®/Microsoft Excel® and Microsoft Word®** **Apps: Google Drive/web browser** **Hardware: Laptop or desktop computer with internet connection** **Outcome: Online opinion poll survey, charts showing analysis of data, brief illustrated report**
Metacognition	**Planning**		**Monitoring**		**Evaluation**	
	What resources do I need to carry out my task? **Have I done anything like this before?** **How can I link my learning with my own experiences to help me?**		**Am I doing well?** **Do I need any different techniques to improve my learning/task?**		**Am I able to re-tell stories and link them to other areas of learning?** **How did I do in my task?**	

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Class 3 Year 4,5,6 Year A	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Concept And Knowledge	Computing: We are Software Developers Online Safety: We are Rule Writers Unit 4.1 Developing an Education Game 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.	Computing: We are Toy Designers Online Safety: We are Standing up to Peer Pressure Unit 4.2 Prototyping an Interactive 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	Computing: We are Musicians Online Safety: We are aware that Online Content lasts Forever Unit 4.3 Producing Digital Music 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	Computing: We are HTML Editors Online Safety: We are On-line Risk Managers Unit 4.4 Editing and Writing HTML 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	Computing: We are Co-Authors. Online Safety: We are Respectful of Digital Rights and Responsibilities Unit 4.5 Producing a Wikki 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.	Computing: We are Meteorologists Online Safety: We are Careful when talking to Virtual friends Unit 4.6 Presenting the Weather 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

		algorithms and programs	**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 ... .**	**internet services) to accomplish given goals, including presenting information.**	**Be discerning in evaluating digital content. Use ... a variety of software (including internet services) ... to ... create ... content ... including ... presenting information. .**	**(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.**
Skill Progression	**This unit will enable the children to: 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.**	**This unit will enable the children to: design and make an on-screen prototype of a computer-controlled toy understand different forms of input and output (such as sensors, switches, motors, lights and speakers) design, write and debug the control and**	**Understand some elements of survey design Understand some ethical and legal aspects of online data collection Use the web to facilitate data collection Gain skills in using charts to analyse data Gain skills in interpreting results.**	**This unit will enable the children to: 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 understand some of the risks in using the web**	**This unit will enable the children to: 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**	**This unit will enable the children to: understand different measurement techniques for weather, both analogue and digital use computer-based data logging to automate the recording of some weather data use spreadsheets to create charts analyse data, explore inconsistencies in data and**

		monitoring program for their toy.			write for a target audience using a wiki tool develop collaboration skills develop proofreading skills.	make predictions practise using presentation software and, optionally, video.
On-Line Safety Skills	Review on-line safety rules covered in Year 3. Consider what on-line safety rules may need changing now they are using on-line resources at home and school more suitable for their age	Recall that any information or pictures shared on-line cannot always be controlled Understand that peer pressure can be both a positive and a negative influence	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour.	Understand that every time we use the internet we leave a digital trail that can be found, copied, shared and broadcast Understand that the things we upload onto the internet last forever	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	Understand that internet identities are actively constructed by the user Understand that internet identities can be misleading or not representative of the creator Recall that personal information should not be shared by anyone on-line who we don't know
Resource	Software: Scratch/Snap! Apps: Pyonkee Hardware: Laptop/desktop computer, microphones (not essential)	Software: Scratch/Snap! Apps: Pyonkee Hardware: Laptops/computers, microphones and speakers, BBC micro:bit and Raspberry Pi	Software: Isle of Tune, Audacity®, LMMS/GarageBand, MuseScore (optional), SoundBox Apps: Isle of Tune, GarageBand Hardware: Computers or tablets, microphones,	Software: Firefox, Brackets, Chrome developer tools Apps: Safari, Koder Hardware: Laptop/desktop computers Outcome: HTML challenges and a personal homepage	Software: Learning platform wiki tools/MediaWiki/ Google Sites/other hosted wiki Apps: Web browser (e.g. Safari), Wikipedia app	Software: Microsoft Excel®/Google Sheets, web browser, Microsoft PowerPoint®/IWB software Apps: Weather Station by Netatmo, Weather Station.UK,

	Outcome: 'Drill-and-practice'-style educational software aimed at reinforcing learning in another area of the curriculum, perhaps for a different age group	**Outcome: Scripts for an on-screen prototype of a computercontrolled toy, Dragons' Den-style presentation**	**midi instruments, if available Outcome: A piece of backing music to accompany work in another medium**		**Hardware: Computers and internet connection, web server (if hosting MediaWiki) Outcome: Class wiki and amended pages of Wikipedia**	**Numbers, Keynote/Explain Everything Hardware: Equipment for measuring weather Outcome: Spreadsheet of weather data collected; charts, maps and graphs of weather data collected; TV-style weather presentation**
Class 3 Year 4,5,6 Year B	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Concept And Knowledge	**Computing: We are Game Developers Online Safety: We are Rule Writers Unit 5.1 Developing an Interactive Game Design, write and debug programs that accomplish specific goals, including controlling or simulating**	**Computing: We are Cryptographers Online Safety: We are Responsible for our Online Actions Unit 5.2 Cracking Codes Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in**	**Computing: We are Artists Online Safety: We are Protecting Our On-line Reputation Unit 5.3 Fusing Geometry and Art Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.**	**Computing: We are Developers Online Safety: We are Respectful of Copyright Unit 5.4 Creating a Website about Cyber-Safety Understand computer networks including the internet; how they can provide multiple services,**	**Computing: We are Bloggers Online Safety: We are Content Evaluators Unit 5.5 Sharing Experiences and Opinions Understand computer networks including the internet; how they can provide multiple services,**	**Computing: We are Architects Online Safety: We are Game Changers Unit 5.6 Creating a Virtual Space Use search technologies effectively, appreciate how results are selected and ranked, and be discerning**

	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.** **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,**	**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 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, including collecting, analysing, evaluating and presenting data and information.**	**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 collecting, analysing, evaluating and presenting data and information.**	**such as the world wide web; and the opportunities they offer for communication and collaboration.** **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.**	**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**

	systems and content that accomplish given goals ...			**Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact**		
Skill Progression	**This unit will enable the children to: 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.**	**This unit will enable the children to: be familiar with semaphore and Morse code 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.**	**This unit will enable the children to: develop an appreciation of the links between geometry and art become familiar with the tools and techniques of a vector graphics package 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**	**This unit will enable the children to: 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 develop and refine their ideas and text collaboratively develop their understanding of online safety and responsible use of technology.**	**This unit will enable the children to: 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.**	**This unit will enable the children to: understand the work of architects, designers and engineers working in 3D develop familiarity with a simple CAD (computeraided design) tool develop spatial awareness by exploring and experimenting with a 3D virtual environment develop greater aesthetic awareness.**

			art, in particular fractal-based landscapes			
On-Line Safety Skills	**Consider what new strategies they can apply to on-line safety scenarios beyond talking to a trusted adult**	**Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact**	**Understand that because of the interne information can be spread more quickly and reach more people now than at any time in the past Understand that although info on the internet may not always be true or accurate it last forever**	**Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact**	**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.**	**Understand that virtual friends are still strangers that they do not know Apply their knowledge of on-line safety to decide what info they as virtual friends can safely share on-line Recap rules for reporting suspicious or uncomfortable on-line situations**
Resource	**Software: Scratch/Snap! (or Kodu) Apps: Pyonkee Hardware: Desktop/laptop computers, microphones Outcome: An original computer game, ideally uploaded to the Scratch community site**	**Software: Scratch/Snap!, The Black Chamber (website) Apps: The Black Chamber in the web browser, Pyonkee Hardware: Laptop/desktop computers Outcome: Morse and semaphore messages, encrypted and decrypted messages in various ciphers**	**Software: Inkscape/Adobe Illustrator/CorelDRAW, Scratch/ Snap!, Terragen, Logo Apps: Adobe Ideas/neu.draw, Pyonkee/i-Logo Hardware: Laptop or desktop computers/tablets Outcome: Pieces of geometric art and a Scratch computer program for drawing shapes**	**Software – Scratch, Snap!, MS PowerPoint, Tux paint, Scratch Jnr Apps - Pyonkee**	**Software: WordPress/Blogger/learning platform blogging tool or similar, GIMP, Audacity®, iMovie Apps: WordPress, Camera, Snapseed Hardware: Computers, digital cameras, audio recorders/tablets Outcome: A media-rich online blog**	**Software: Trimble SketchUp (used for 3D modelling), Screencast-o-matic (for final screencast), Minecraft Apps: Home Design 3D/3dVAS, Sketchup Viewer Hardware: Laptops/computers Outcome: A virtual gallery displaying the pupils' work**

North Petherwin and Werrington

Computing Knowledge and Skills Organiser

Metacognition	Planning		Monitoring		Evaluation	
	What resources do I need to carry out my task? Where do I start and what strategies will I use? What type of resources will I need to complete my learning? Have I got everything I need to complete my task? How can I break down the task into smaller steps to make my learning more manageable?		Do I need any different techniques to improve my understanding of the process? Am I finding this challenging? Do I need to re-read information to make it clearer? Do I need to change my strategy?		Did I use the right strategy? How did the feedback I received help me? For future tasks, would I use another strategy?	
Class 3 Year 4,5,6 Year C	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Concept And Knowledge	Computing: We are Adventure Gamers Online Safety: We are Online safety Ambassadors Unit 6.1 Making a Text- based Adventure Game Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing	Computing: Computational Thinkers Online Safety: We will not share Inappropriate Images 6.2 Mastering Algorithms for Searching, Sorting and mathematics Design, write and debug programs that accomplish specific goals. Use sequence, selection, and repetition in	Computing: We are Advertisers Online Safety: We are Social Networkers 6.3 Creating a Short TV Advert Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. Use search technologies effectively, appreciate	Computing: Network Technicians Online Safety: We are Respectful of Others 6.4 Exploring computer Networks including the Internet Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities	Computing: We are Travel Writers Online Safety: We are On-Line Safety Problem Solvers 6.5 Using Media and Mapping to Document a Trip Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	Computing: We are Publishers Online Safety: We are Safe Gaming Experts 6.6 Creating a Year book or Magazine Understand computer networks including the internet and the opportunities they offer for communication and collaboration. Use search technologies effectively, appreciate

	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	**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.**	**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 concerns about content and contact.**	**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.**	**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 identify a range of ways to report concerns about content and contact**	**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**
Skill Progression	**This unit will enable the children to:**	**This unit will enable the children to:**	**This unit will enable the children to:**	**This unit will enable the children to:**	**This unit will enable the children to:**	**This unit will enable the children to:**

	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	**develop the ability to reason logically about algorithms 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 searching and sorting a list appreciate algorithmic approaches to problems in mathematics.**	**think critically about how video is used to promote a cause storyboard an effective advert for a cause work collaboratively to shoot suitable original footage and source additional content, acknowledging intellectual property rights work collaboratively to edit the assembled content to make an effective advert**	**appreciate that computer networks transmit and receive information digitally understand the basic hardware needed for computer networks to work understand key features of internet communication protocols develop a basic understanding of how domain names are converted to numerical IP addresses.**	**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.**	**manage or contribute to large collaborative projects, facilitated using online tools write and review content source digital media while demonstrating safe, respectful and responsible use design and produce a high-quality print document.**
On-Line Safety Skills	**Consider what new strategies they can apply to on-line safety scenarios beyond talking to a trusted adult**	**Understand that access to the internet is the not the same for everyone Recall ways to report concerns and inappropriate om-line behaviour by others**	**Understand that because of the interne information can be spread more quickly and reach more people now than at any time in the past Understand that although info on the**	**Understand the risks involved in clicking on and opening links on suspicious websites and in emails Understand that hacking can be illegal and has consequences for the hacker**	**Understand that both digital rights and responsibilities are important to ensure the internet is an enjoyable place for all Understand that there are consequences for**	**Understand that virtual friends are still strangers that they do not know Apply their knowledge of on-line safety to decide what info they as virtual friends can safely share on-line**

			internet may not always be true or accurate it last forever	Demonstrate an awareness of viruses and what to do if they think their account has been compromised	knowingly ignoring rights Develop a positive and responsible attitude towards technology and internet use	Recap rules for reporting suspicious or uncomfortable on-line situations
Resource	Software: Python and IDLE, or trinket.io Apps: Pythonista or Python 3.4 for iOS (iOS), SL4A (Android), or trinket.io via Safari or other browser, Bluetooth keyboards are recommended for tablets Hardware: Laptop/desktop computers. Python works very well on the Raspberry Pi Outcome: A text-based adventure game	Software: Scratch and Snap! Apps: Snap! using Safari Hardware: Laptop or desktop computers; some 'unplugged' resources Outcome: An understanding of random, linear and binary search; bubble sort and quicksort; algorithms for testing for primer number and finding common factors	Software: iMovie (Mac) Apps: iMovie Hardware: Desktop/laptop computer; digital video cameras/digital cameras/tablet computers Outcome: A short video advert to promote a cause or concern.	Software: This unit is mainly 'unplugged' (no technology required). For extension activities, the pupils could use the Command Prompt in Windows to access simple tools such as ping, ipconfig, nslookup, tracert. Open Visual Traceroute (or web-based equivalents) and/or a network emulator (GS3). Apps: Web-based equivalent tools via the browser, CISCO Packet Tracer Mobile. Hardware: Desktop or laptop computer/a Raspberry Pi Outcome: Pupils take part in activities to learn	Software: Google Maps/Google Earth, Pixlr, Audacity, Google Sites Apps: Google Earth, Snapseed, iMovie, Garageband, TrackRec Hardware: Tablet computers and/or smartphones, desktop/laptop computers, web server or online hosting Outcome: An online transmedia project documenting an educational visit-	Software: Microsoft Publisher/Scribus/iBook Author, Pixlr, Microsoft Word/ Google Docs, Adobe Acrobat, Google Drive Apps: Pages/Book Creator, Snapseed, Google Drive Hardware: Laptop/desktop computers, digital cameras, iPads Outcome: A collaboratively edited, desktop-published yearbook

				about computer networks and create a poster to share their knowledge with others		
Metacognition	**Planning**		**Monitoring**		**Evaluation**	
	What resources do I need to carry out my task? **Where do I start and what strategies will I use?** **What type of resources and materials will I need to complete my learning?** **How can I break down the task into smaller steps?**		**Am I finding this challenging?** **Is there anything I need to stop and change to improve the understanding of my learning?** **Do I need to re-read information to make it clearer?** **Do I need to change my strategies?**		**Did I use the right strategy?** **How did the feedback I received help me?** **For future tasks, would I use another strategy?** **Did I pace myself appropriately to get the task done?**	