Pendeen School Computing Curriculum

Skills and knowledge taught every year – applied in the first year and consolidated/mastered in the second.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Kynsa (YR)	Using the iPad and accessing educational games. Understanding safety online.		Simple Programming / Computational Thinking		Creating simple algorithms / Learning to Type	
Nessa (Y1/2)	How do I use my equipment? How do I keep myself safe online?	What is a computer program?	How do I use the computer to create, organise, store, manipulate and retrieve content? + Internet Safety Day	How do I create a simple program? What is an algorithm?	How do I fix the mistakes? Where is information & computing technology used?	How do I keep myself safe online?
Teyr (Y3/4)	How do I use my equipment? How do I keep myself safe online?	How do I choose the right software to achieve my goals?	How do sequences, selection and repetitions in programs work? + Internet Safety Day	What is logical reasoning? How do I fix errors in my algorithms?	How do I design, write and debug programs to achieve specific goals?	How do I keep myself and others safe online? How can I report concerns & spot unacceptable behaviour?
Peswara (Y5/6)	How does my equipment link to the world? How do I keep myself safe online?	What opportunities can ICT services offer for communication and collaboration?	How do computer networks work? How can I present my work? + Internet Safety Day	How do I make effective searches and know which results to trust?	How do I design, write and debug programs to achieve specific goals?	How I solve problems with my own coding programming?

Early Years

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Kynsa (YR)	Using the iPad and accessing educational games. Understanding safety online.		Simple Programming / Computational Thinking		Creating simple algorithms / Learning to Type	

Autumn

	Week 1 - 4	Weeks 5 - 8	Weeks 9 - 12
LO	I can understand the difference between games for children and games for adults	I can demonstrate my understanding of what types of games are suitable for me.	I can follow algorithms
Resources	iPads, apps, Smartie the Penguin PPT https://www.childnet.com/resources/smartie-the-penguin	Design your own game: https://www.twinkl.co.uk/resource/t-t-29320-design-your-own-tablet-game-activity-sheet Explore whole class stories: Chicken Clickin, Goldilocks (A Hashtag Cautionary Tale)	Dance Mat Algorithms Concepts / Approaches: Algorithms Curriculum Links: PE, PSHE Pupils will make up a dance routine and create the instructions (an algorithm) for a partner to follow.
Project / Outcome	I can explain why some games are better for children and what to do if I need help. I can access age appropriate games and navigate the controls to achieve in the games. I can switch the iPad on and off and I can store it sensibly away. I can manage my time on the game and know how long to play. I can keep myself safe online.		

Spring – Resources available on Staff Share Drive

	Spring 1	Spring 2
LO	I can start to build simple algorithms with computational thinking approach.	I can apply computational thinking to the world around me.
Resources	BUSY BODIES Curriculum Links: PSHE, English, Science Concepts & Approaches: Algorithms, Decomposition, Debugging, Logic, Patterns, Abstraction Provides four activities that help children discover how bodies move and grow. Using the resources provided they explore and learn about parts of the body, growth and movement. Simple algorithms are created and adapted to form a routine of movements.	BOATS AHOY – on staff share Curriculum Links: Science, Maths, English, D&T Concepts & Approaches: Algorithms, Decomposition, Creating, Tinkering, Logic, Patterns, Abstraction, Collaborating Takes children on a journey of discovery as they investigate boats. Four activities make up this set of resources. Includes different uses of boats, floating and sinking predictions, creating a good boat through exploring designs and role play.

Summer – Resources available on Staff Share Drive

	Summer 1	Summer 2
LO	I can extend my computational thinking	I can apply computational thinking
Resources	Summer Fun: Curriculum Links to: Maths, Early Years Computational Thinking Concepts & Approaches: Tinkering, Persevering, Patterns, Logic, Decomposition Debugging, Collaborating, Algorithms These three activities see pupils explore their own environment collecting things to group, create a catcher, take and map a journey and discover seaside tangrams. All the activities encourage speaking and listening as well as early years mathematical concepts, alongside computational thinking.	Type: Bee-Bots Curriculum Links to: PSHE Computer Science Concepts: Programming Computational Thinking Concepts & Approaches: Debugging, Decomposition, Algorithms The aim of the activity is for the class to create a program to control a single Bee-Bot, or similar floor robot, around a complex course. The pupils achieve this by decomposing the route into sections, creating the algorithm in smaller steps and then programming the Bee-Bot. PUPIL OBJECTIVES: I can break down a problem into smaller parts. I can create an algorithm and a program to move a robot to a specific point. I can detect and correct errors in my program.
Continuous Provision:	Typing Game – start on level 1: https://www.bbc.co.uk/bitesize/topics/zf2f9j6/articles/z3c6tfr	Typing Game – start on level 1: https://www.bbc.co.uk/bitesize/topics/zf2f9j6/articles/z3c6tfr

KS1

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nessa (Y1/2)	How do I use my equipment? How do I keep myself safe online?	What is a computer program?	How do I use the computer to create, organise, store, manipulate and retrieve content? + Internet Safety Day	How do I create a simple program? What is an algorithm?	How do I fix the mistakes? Where is information & computing technology used?	How do I keep myself safe online?

Autumn 1

	Week 1 & 2	Week 3 & 4	Week 5 & 6
LO	To be able to switch on and log into my equipment to access programs	3: To understand how to access links on my desktop 4: To begin using the keys to type	To know what to do if something is wrong on the screen + Refresh typing skills
Resources	Laptop device, username and log in details	Laptop device, username and log in details, headphones Typing Game – start on level 1: https://www.bbc.co.uk/bitesize/topics/zf2f9j6/articles/z3c6tfr	https://www.saferinternetday.org/ https://www.saferinternet.org.uk/safer-internet-day Typing Game – start on level 1: https://www.bbc.co.uk/bitesize/topics/zf2f9j6/articles/z3c6tfr
Vocabulary	Device, computer, power, log on, laptop, keyboard, keys, screen, mouse pad, headphones, desktop, background, log off, shut down, plug in, icons, single click, double click, left mouse click, right mouse click, interface,	Keyboard home row, keys, typing, pointing fingers, space bar, Power, log on, laptop, keyboard, keys, screen, mouse pad, headphones, desktop, background, log off, shut down, plug in, icons, single click, double click, left mouse click, right mouse click	Online, internet, browse, search, find, safe, safety, Keyboard home row, keys, typing, pointing fingers, space bar,
Project / Outcome	I can independently switch on, log in to, log out of and shut down my laptop	I can click on the icons on my desktop. I have started to use the home row keys.	I can say what to do if I'm not sure. I have started to use the home row keys. To record a Class Dojo video saying how they keep themselves safe (teacher / TA led)

Autumn 2

	Week 1 & 2	Week 3 & 4	Week 5 & 6
LO	Week 1: To develop typing skills Week 2: To explore and understand that programs have different uses	To explore a range of programs and use alongside other curriculum areas to create a linked outcome. To develop typing skills	To explore web browser and conduct searches online
Resources	Typing Game – start on level 1: https://www.bbc.co.uk/bitesize/topics/zf2f9j6/articles/z3c6tfr Microsoft Word, PowerPoint, Games, Media Player (or VLC media player), web browser, Class Dojo, Spelling Shed, TT Rockstars	Laptop device, username and log in details Microsoft Word or Power Point	Laptop, username and login details, browser, printer, Reminder of online safety and what to do if unsure. Read Goldilocks: A Hashtag Cautionary Tale – In Computing Drawer
Vocabulary	Keyboard home row, keys, typing, pointing fingers, space bar, Program, use, purpose, media, digital, create, content, icon, browser, device, file, print, interface	Keyboard home row, keys, typing, pointing fingers, space bar, Program, use, purpose, media, digital, create, content, icon, browser, device, file, print	Keyboard home row, keys, typing, pointing fingers, space bar, Program, use, purpose, media, digital, create, content, icon, browser, device, file, print
Project / Outcome	I can use the home row keys confidently. I can explain the purpose of the programs I've explored	I can use a program to present my work. I can print my work.	Linked to other subject areas, research something simple online and copy it into Microsoft Word

Spring 1

	Week 1 & 2	Week 3 & 4	Week 5 & 6
LO	To understand how folders work To be able to save my work To refresh typing skills – typing game (see Autumn 1&2)	To be able to retrieve my work To be able to change and re-save my work under a new name	To be able to explain to others how to save work. To refresh typing skills – typing game (see Autumn 1&2)
Resources	Typing Game – start on level 1: https://www.bbc.co.uk/bitesize/topics/zf2f9j6/articles/z3c6tfr Laptops, login details, access to student shared drive, access to a program	Laptops, login details, access to student shared drive, access to a program	Typing Game – start on level 1: https://www.bbc.co.uk/bitesize/topics/zf2f9j6/articles/z3c6tfr Class Dojo video recording
Vocabulary	Program, use, purpose, media, digital, create, content, icon, browser, device, file, print, interface	Program, use, purpose, media, digital, create, content, icon, browser, device, file, print, interface	Program, use, purpose, media, digital, create, content, icon, browser, device, file, print, interface
Project / Outcome	I can save my work into the Student Drive folder. I am building confidence with typing using the keyboard.	I can browse to the Student Drive and the folder where my work is saved. I can edit my work and save it again.	I can produce a video to explain how to save, retrieve and organise work.

Spring 2 Resources available on Staff Share Drive > Curriculum > Computing > KS1

	Week 1 & 2	Week 3 & 4	Week 5 & 6
LO	To understand what a simple program is. To be able to explain what an algorithm does.	To be able to build simple, one and two step programs.	To explain how the instructions (the algorithm) helps the program to work
Resources	BeeBots – for reminder / explanation (See Staff Shared) Walk around school – follow directions Scratch – to explore simple games available on the site. Teacher to search for appropriate examples.	Scratch Usernames and passwords Scratch Tinkering Activity (Staff Share)	Class Dojo video recording – using their saved Scratch projects, children create videos to explain key vocabulary and how they built their simple algorithms to create a small program
Vocabulary	Program, algorithm, sequence, instructions, control, input, information, logical reasoning, loop, platform, script, sprite, Unicode, output, block, command, interface, repetition, selection, (APPLIES TO WHOLE TERM) Teacher subject knowledge: Intro to Scratch: https://www.youtube.com/playlist?list=PLnhWhI6FE9a0feOBY-glkRfjDJaeAtaIS If this link no longer work, search 'Intro to Scratch' on YouTube.	Computer Science Concepts: Programming Computational Thinking Concepts & Approaches: Tinkering This activity involves two main tasks. Firstly, pupils tinker with an existing Scratch program, which is an animation of two characters chatting, before then tinkering with a blank project in Scratch. PUPIL OBJECTIVES: I can explore Scratch for myself. TEACHING ASSESSMENT OPPORTUNITIES: The open questions provided above and used throughout this tinkering activity will both help encourage, and gauge, pupils' developing understanding of Scratch. Observe pupils in their exploration. Are pupils confident to tinker independently or do they wait for instruction? Do they copy others or try new and novel ways of using the equipment? Listen to their discussion about tinkering with their peers, do they ask other's questions about how they did things, do they suggest ideas? Are they open to new ideas and build on others ideas to discover more?	Program, algorithm, sequence, instructions, control, input, information, logical reasoning, loop, platform, script, sprite, Unicode, output, block, command, interface, repetition, selection, (APPLIES TO WHOLE TERM)
Project / Outcome	Children tinker and play with simple programs, sequences and instructions, being able to explain their purpose and how they work.	Independently driven Scratch projects	To produce a video in pairs to explain how algorithms make computers work.

Summer 1

	Week 1 & 2	Week 3 & 4	Week 5 & 6
LO	I can debug a program. I can say what a program will do. I can explain what the bug was and how I fixed it. PIZZA PICKLE ACTIVITY (See Staff Share)		To understand where information and computing technology is used
Resources	Type: Scratch Curriculum Links to: D&T Computer Science Concepts: Programming Computational Thinking Concepts & Approaches: Abstraction, Persevering, Logic, Debugging In this activity pupils are given programs that do not do as expected and will be asked to fix them. In doing this they are using logical reasoning to predict what will happen and developing their debugging skills. TEACHING ASSESSMENT OPPORTUNITIES: Use AFL questioning to encourage and gauge pupils' developing understanding of debugging simple programs. Pupils who work out what the program should do, what it does do, where it goes wrong and then fix it are making good progress. Pupils who look at each command in turn and explain their thinking are making good progress. Pupils who haphazardly try changing things with no reason are not making such good progress, even if they fix the bugs! Teacher subject knowledge: Intro to Scratch: https://www.youtube.com/playlist?list=PLnhWhI6FE9a0feOBY-glkRfjDJaeAtaIS If this link no longer work, search 'Intro to Scratch' on YouTube.		Homework – Interview a grown up about where they use computers. Extend beyond tablets/ phones for entertainment etc. What do they use a computer for? Where can computers be found around the home (again, avoiding basic ideas) – such as in washing machine, microwave, traffic lights etc
Vocabulary	Program, algorithm, sequence, instructions, control, input, information, logical reasoning, debug, loop, platform, script, sprite, Unicode, output, block, command, interface, repetition, selection, (APPLIES TO WHOLE TERM)		Program, use, purpose, media, digital, create, content, icon, browser, device, file, print, interface
Project / Outcome	I can debug a program and explain what went wrong		Children create a video report of their developing understanding of what computing is for, beyond entertainment

Summer 2

	Week 1 & 2	Week 3 & 4	Week 5 & 6
LO	Online Safety		
Resources	Safety Snakes – On Staff Share Safety Snakes provides an excellent way for young pupils to learn about good and unwise online behaviour. As they make their way around the game board, they will land on squares providing details of different types of online scenarios. Good scenarios are placed at the bottom of ladders, so pupils are rewarded with a lift onto a higher square when they land there. Squares with details of unwise scenarios sit at the top of the snakes, so pupils learn that they literally go backwards if they land on these squares. This 'carrot and stick' methodology helps pupils understand what they should and should not do when they are using the internet.		Teacher's own. Creating a poster to recognise ways to keep yourself safe online.
Vocabulary	Safety, concern, online, reporting, internet, social media, conscious, awareness, digital citizen, virus, bug, filters SMART	Safety, concern, online, reporting, internet, social media, conscious, awareness, digital citizen, virus, bug, filters SMART	Safety, concern, online, reporting, internet, social media, conscious, awareness, digital citizen, virus, bug, filters SMART
Project / Outcome	Children are aware of safe and unsafe behaviour online and can explain ways to avoid issues or concerns.		Creating a poster (using a program) to demonstrate understanding of SMART rules to keep yourself safe online.

LKS2

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Teyr (Y3/4)	How do I use my equipment? How do I keep myself safe online?	How do I choose the right software to achieve my goals?	How do sequences, selection and repetitions in programs work? + Internet Safety Day	What is logical reasoning? How do I fix errors in my algorithms?	How do I design, write and debug programs to achieve specific goals?	How do I keep myself and others safe online? How can I report concerns & spot unacceptable behaviour?

Autumn 1

	Week 1 & 2	Week 3 & 4	Week 5 & 6
LO	To recall login, log out, shut down procedures To recap saving work To share a piece of work with family at home	To be able to explore ways that online experiences can be safe or unsafe.	To be able to keep yourself safe online
Resources	Typing Game – start on level 1: https://www.bbc.co.uk/bitesize/topics/zf2f9j6/articles/z3c6tfr Laptops, login details, access to student shared drive, access to a program Class Dojo access Linked piece of work that can be shared – English, foundation piece of writing or presentation etc.	You're the Jury – Activity on Staff Share This lesson sees the classroom turned into a courtroom as pupils hear several cyber-crime court cases. Pupils take on the roles of judge, barristers and members of the jury as they determine whether the defendant has broken the law, the sentence they could receive and the impact on victims of their crimes. There are a further two extension lessons where pupils use what they have learnt to plan and go on to film TV adverts to discourage the misuse of computers. They will use computational thinking concepts and approaches as they create a storyboard and later film their adverts. PUPIL OBJECTIVES: Lesson 1 I can understand some of the law around what it is illegal to do with computers. I can give examples of activities which break the law using computers. I can identify the victims of cyber crimes. Lesson 2 I can identify the important information to include in our advert. I can decompose our advert Lesson 3/4 I can use my storyboard and film our TV advert. I can edit my TV advert (if required).I can evaluate my TV advert TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of understanding through lesson and assessment of the pupils' 'Verdict record sheets'. Key understanding to assess: Lesson 1: Do pupils understand some of what it is illegal to do with a computer? Can pupils identify illegal activities which use computers? Can pupils explain which part of the law has been broken? Can pupils identify the victims of cyber-crimes? Do pupils know the typical sentences associated with some cyber-crimes? Lesson 2 Can pupils identify the key information to include in their advert? Can pupils decompose their advert to create their storyboard algorithm? Do pupils' storyboards include the key information? Do pupils' advert plans meet the features of the success criteria? Lesson 3 Can pupils work in groups to create an advert? Can pupils use the hardware and software to film and edit their adverts? Do pupils' adverts match their storyboards? Can pupils evaluate their adverts against the success criteria?	
Vocabulary	Program, use, purpose, media, digital, create, content, icon, browser, device, file, print, interface		
Project / Outcome	To be able to log in and out, save, retrieve and share work independently	To understand cyber crime and develop an advertisement to demonstrate their understanding.	

Autumn 2

	Week 1, 2 & 3	Week 4, 5 & 6
LO	To investigate the use of installed software To create work using appropriate software	To explore computational thinking and a range of software
Resources	Word, Excel, PowerPoint, Publisher Laptops IWB Teacher to introduce children to the four pieces of software and demonstrate some key features of each. Then, give children opportunity, linked to the wider curriculum, to create and use each piece of software. Time allowed in computing and other session to create pieces. Teacher subject knowledge: Word: https://www.youtube.com/watch?v=S-nHYzK-BVg Excel: https://www.youtube.com/watch?v=rwbho0CgEAE PowerPoint: https://www.youtube.com/watch?v=XF34-Wu6qWU Publisher: https://www.youtube.com/watch?v=Cqo0PVhBFYI If these links no longer work, search 'Intro to Word (replace as appropriate)' on YouTube.	Barefoot Bytes: (Activity on Staff Share) Age: 7-9 years Type: Quick collaborative activities Curriculum Links to: PSHE, PE, Maths, English, D&T Computational Thinking Concepts & Approaches: Patterns, Logic, Decomposition, Collaborating, Algorithms, Abstraction Our little bytes of learning fun have been designed to encourage pupil engagement with collaborative activities. These are easy to do and can be used in school and at home tech-free, using pens, paper and other everyday items to teach computational thinking skills and concepts, encompassing a range of different subjects. For those aged 7-9 we have the following activities to try; Build-Describe-Reveal – use Lego/building bricks to explore decomposition and collaboration Let's play – invent a new game Healthy body – create an exercise routine Time for a timetable – create a school timetable using patterns Sorting our bubble- explore similarities and patterns Flying the flag – produce a class flag through collaboration Our gratitude tree – write on a leaf to create a tree at school or at home Guess the pupil – use logic and abstraction to discover the answer
Vocabulary	Browser, desktop, icons, menu, data, output, pattern, software, selection, lists, tables, arrays, margins, background, foreground, work space, information, sharing, presentation, configuration, control, file, save, open, insert, wrap text, format, font, design, layout, copy, cut, paste, format painter, styles, colour, transition, animation, formula,	
Project / Outcome	Typing & image insert on Word Simple calculations completed in Excel, expressed in formula code =SUM(B1+B2) / =SUM(A:A) for column / =SUM(A5:A12) Create a 2 slide PowerPoint with images and animation Create a poster using Publisher Children can explain the purpose of each and begin to select appropriate software for the tasks they are completing.	Exploration of software and purposes. To develop computational thinking strategies.

Spring 1

	Week 1 & 2	Week 3 & 4	Week 5 & 6
LO	To be able to build two, three and four step sequences	To investigate and use simple html language	To be able to explain how sequences and repetitions achieve a goal in computing
Resources	Begin by exploring a simple set of instructions for 'how to make a sandwich'. How and why is this a sequence? Log into Scratch & familiarise children with the site. https://classroom.thenational.academy/lessons/introducing-variables-71k68d?activity=video&step=1 https://classroom.thenational.academy/lessons/variables-in-programming-cmtpad Teacher subject knowledge: Intro to Scratch: https://www.youtube.com/watch?v=fwyg6d5BhTw https://www.youtube.com/playlist?list=PLnhWhI6FE9a0feOBY-glkRfjDJaeAtaIS If these links no longer work, search 'Intro to Scratch' on YouTube.	Session 1: https://classroom.thenational.academy/lessons/what-makes-a-good-website-c9gkcc Session 2: https://classroom.thenational.academy/lessons/how-would-you-lay-out-your-web-page-6djp2t Teacher subject knowledge: Intro to html: https://www.youtube.com/watch?v=BvJYXl2ywUE If these links no longer work, search 'Intro to html' on YouTube.	Build on 'how to make a sandwich' by completing the task out of order. https://classroom.thenational.academy/lessons/designing-a-game-64tpae Then, Fossil Formation Animation (On Staff Share) Age: 7-9 years. Type: Scratch. Curriculum Links to: computing, Science. Computer Science Concepts: Sequence, Programming. Computational Thinking Concepts & Approaches: Collaborating, Abstraction, Algorithms In this activity pupils program an animation illustrating the steps in fossil formation. In doing so they learn that programming is the process of implementing algorithms as code, and about sequencing commands in Scratch. PUPIL OBJECTIVES: I can write a program with a sequence of instructions. TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of progress during the activities and formal, summative assessment of Scratch projects. Focus on: pupils correctly sequencing algorithm; pupils writing correctly sequenced code for their program; pupils understanding importance of a correctly sequenced algorithm and code. Peer assessment of algorithms and completed animations.
Vocabulary	Coding, Scratch, Sprite, Sequence, command, algorithm, program, programming, input, output, steps, animation	html, code, coding, web browser, website, url, www, https,	Coding, Scratch, Sprite, Sequence, command, algorithm, program, programming, input, output, steps, animation
Project / Outcome	I can build a sequence of events using Scratch. I understand how sequences work.	Children to create an edit a piece of html text with a phrase or word they'd identify, based on changing the colour, font and size on the school class page – something they have uniquely created themselves using html code.	I can explain why systems need to follow a sequence – I can produce a 'how to video' for next year's class.

Spring 2

	Week 1, 2 & 3	Week 4, 5 & 6
LO	To explore 'logic' and 'reasoning' as terms To begin to develop systematic approach to coding. To be able to identify errors in coding and use logical reasoning to correct them.	I can use logical reasoning to debug a program. I can explain how I debugged a program.
Resources	Weeks 1 & 2: https://classroom.thenational.academy/lessons/design-to-code-74u3cd Week 3: https://classroom.thenational.academy/lessons/improving-and-refining-6rtkcc	Bug in the water cycle activity (staff share) Type: Scratch Curriculum Links to: computing, Science, Geography. Computer Science Concepts: Programming. Computational Thinking Concepts & Approaches: Logic & debugging. In this activity pupils are challenged to detect and correct the error in a number of water cycle programs (debugging). They use logical reasoning to do this, comparing what the program should do with what it does do, and systematically homing in on the error (bug) by 'thinking through' the code in the program. PUPIL OBJECTIVES: I can use logical reasoning to debug a program. I can explain how I debugged a program. TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of pupils as they tackle the debugging challenge: focus on pupils' logical approach and ability to explain the bugs they found, why they are bugs and how they corrected them. Summative assessment of pupils' debugging challenge sheets.
Vocabulary	Logic, sequence, systematic, errors, debug, reasoning, simulation, decomposition, generalization, abstraction, variable, code, condition, evaluation, input, output, selection, sequence, repetition, loop, Coding, Scratch, Sprite, Sequence, command, algorithm, program, programming, input, output, steps, animation,	
Project / Outcome	I can use a systematic approach and begin to identify/correct errors in code.	Using logical reasoning to debug a program. Create a video to explain how the program was debugged.

	Term wide block
LO	I can design, write and debug programs to achieve specific goals.
Resources	Scratch Children to create a short game in which they need to achieve a particular purpose (linked to wider curriculum) Work to be saved and shared with peers and evaluated for errors, following, broadly, the 'make a game' project on staff share Make a Game: In this short project, pupils create a simple game. A rainforest theme has been used as the context here, but the theme can be adapted to any topic. In the first lesson pupils design their game and create artwork for their background and main character. In the following coding lessons, they write and debug their code. In the final lesson they present and evaluate their games. A generic approach is provided in this project; this is so that the activities can be adapted to a classes level of experience, the teacher confidence, the number of lessons needed for coding as well as the topic. Similarly the software used can be adapted, in the examples provided here Scratch has been used, but this could be replaced with alternatives such as Kodu, Hopscotch etc. PUPIL OBJECTIVES: I can decompose a game into its parts. I can design a game. I can create the artwork for a game. I can write and debug a game. I can present a game. I can evaluate a game. TEACHING ASSESSMENT OPPORTUNITIES: Informal, teacher assessment of progress during main tasks, class discussions and plenary. Formal, summative assessment of designs, Scratch code, project journals, evaluation sheets, if used (note however some of these are completed in pairs). Areas to focus on: Design, Decomposition, Algorithms, Programming, Debugging, Sequence, Repetition, Selection, Variables, Presentation, Evaluation
Vocabulary	Logic, sequence, systematic, errors, debug, reasoning, simulation, decomposition, generalization, abstraction, variable, code, condition, evaluation, input, output, selection, sequence, repetition, loop, Coding, Scratch, Sprite, Sequence, command, algorithm, program, programming, input, output, steps, animation,
Project / Outcome	A game to share with peers.

Summer 2

	Week 1,2 & 3	Week 4, 5 & 6
LO	I understand how to keep myself and others safe online	I know how to report concerns and spot unacceptable behaviour
Resources	Internet Safety (on staff share) Children will use and develop their critical thinking skills to question the motives behind what they see. By focusing first on commercial influences (e.g. advertising) it will help them explore trust online and challenge their personal responses when engaging with the wider digital world. Lesson outcomes Children will be able to: ● Describe and recognise some methods used to encourage people to buy things online. ● Give examples of when and why it is important to understand the motive behind online content. ● Use questions to help decide what can and cannot be trusted online.	
Vocabulary	Safety, concern, online, reporting, internet, social media, conscious, awareness, digital citizen, virus, bug, image editing, image distortion, filters	
Project / Outcome	All children demonstrate responsibility when using the internet and can identify key actions to keep themselves and other safe. They understand what is appropriate and what is not appropriate and why there are protections in place to ensure they are kept away from adult content. They begin to understand how their digital presence can affect their real lives. Design posters/ an ad campaign, create help videos, explore issues with drama, produce a whole school class assembly to share their learning.	

UKS2

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Peswara (Y5/6)	How does my equipment link to the world? How do I keep myself safe online?	What opportunities can ICT services offer for communication and collaboration?	How do computer networks work? How can I present my work? + Internet Safety Day	How do I make effective searches and know which results to trust?	How do I design, write and debug programs to achieve specific goals?	How I solve problems with my own coding programming?

Autumn 1

	Week 1 & 2	Week 3 & 4	Week 5 & 6
LO	To understand how to keep myself safe online	To understand how my equipment connects with the world through a network	To be able to explain how computing networks link the world together
Resources	Safer Internet Day resources https://www.saferinternetday.org/ https://www.saferinternet.org.uk/safer-internet-day/2021 https://www.bbc.com/ownit The Phisherman Game (Staff Share) Using The Phisherman game pupils explore an underwater village. The game consists of a number of mini games, with each focusing on a different aspect of phishing. Following each game, several questions and topics are presented to facilitate further discussion and enable children to share their own experiences. The Teacher Guide provides these discussion points and additional activities to support the use of Barefoot's The Phisherman game within the classroom. Click here to play game.(opens in a new window) PUPIL OBJECTIVES: I can define phishing and why it is used by cyber criminals I can identify technologies typically used for phishing I can identify common features and themes of phishing I can identify how to prevent being a victim of phishing TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of understanding during the lesson.	Oak Academy Lessons to develop subject knowledge: https://classroom.thenational.academy/units/sharing-information-adc8 Lessons 1-2	Oak Academy Lessons to develop subject knowledge: https://classroom.thenational.academy/units/sharing-information-adc8 Lesson 3 Network Hunt Activity (Staff Share) Age: 7-11 years Type: Unplugged Curriculum Links to: Geography Computer Science Concepts: Computer Networks In this activity pupils go on a hunt around their school to discover, and map the location of, devices connected to their school's network. Pupils then learn about the role of each device by either conducting web-based research or using the matching activity included. PUPIL OBJECTIVES: I can name devices on a computer network. I can explain the purpose of certain devices on a computer network. TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of pupils during main task and plenary. Focus on understanding of the different network devices and their roles. Formal assessment of pupils' sketch maps indicating devices identified and details of their role.
Vocabulary	Safety, concern, online, reporting, internet, social media, conscious, awareness, digital citizen, virus, bug, image editing, image distortion, filters	Computer systems, networks, interconnectivity, connection, wiring, wireless, technology, information, data, transferring,	Computer systems, networks, interconnectivity, connection, wiring, wireless, technology, information, data, transferring,
Project / Outcome	Teacher led	Drama demonstration of networking across the world.	Teacher led

Autumn 2

	Week 1 & 2	Week 3 & 4	Week 5 & 6
LO	To understand how to communicate online and share only information I want to share.	To be able to participate in a collaboration with others online	To be able to explain how I can be a digitally responsible citizen
Resources	Chat functions in games, social media, WhatsApp, messaging, Stop, think… Do I consent? Activity – (Staff Share) In this activity, pupils learn about the terms and conditions of a variety of social media organisations, and reflect on the personal information which people consent to 'giving away' when they sign up to such websites. Pupils create a 'data gift' which they can place next to their computer, to remind them of the importance of knowing what they are consenting to. The lesson is continued at home as pupils become the teacher and ask their older siblings, parents or carers to reflect on what personal data they too might be giving away in their data gift. Please note that this lesson includes a discussion around social media platforms such as Facebook, Instagram and Snapchat etc. It is important to highlight that the terms and conditions of these organisations stipulate users should be over 13 – for WhatsApp, over 16 – however Pendeen believes it important pupils are educated on how to use these platforms safely prior to them being able to create user accounts - leaving it until after seems a bit late! PUPIL OBJECTIVES: To know what consent means when we agree to terms and conditions online To know the rights we give to social media organisations to use our personal information To understand the value our personal information has to social media organisations	Oak Academy Lessons to develop subject knowledge: https://classroom.thenational.academy/units/sharing-information-adc8 Lessons 4-5	Oak Academy Lessons to develop subject knowledge: https://classroom.thenational.academy/units/sharing-information-adc8 Lessons 6
Vocabulary	Data, consent, sharing, terms and conditions, social media, platforms, user accounts, personal information, legacy	Safety, concern, online, reporting, internet, social media, conscious, awareness, digital citizen, Data, consent, sharing, terms and conditions, social media, platforms, user accounts, personal information, legacy	
Project / Outcome	Teacher led	Work on Class Dojo with another member of class to produce a piece of work. https://www.quiz-maker.com/	Teacher led

Spring 1

	Week 1 & 2	Week 3 & 4	Week 5 & 6
LO	To deepen understanding of computer networks	To be able to appropriately select software to present my work To understand how to maintain cyber security.	To deepen understanding of algorithms and coding
Resources	Modelling the Internet activity (Staff Share) Curriculum Links to: Geography. Computer Science Concepts: Internet Services, Computer Systems, Computer Networks. Computational Thinking Concepts & Approaches: Abstraction. In this activity pupils learn that the internet is a vast network of computers and other devices connected across the world, as they explore the difference between the internet and the world wide web (WWW). Pupils are assigned roles as different digital devices in a human model of the internet and learn how the internet provides access to the WWW (an internet service) as they pass data between them. PUPIL OBJECTIVES: I can explain what the internet is. I can explain the difference between the internet and the WWW. I can explain how the internet provides access to the WWW. TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of progress during the activities. Key pupil knowledge to identify: Can pupils explain what the internet is? Can pupils name the different devices on the internet? Can pupils describe the function of the different devices on the internet? Can pupils explain the difference between the internet and the WWW? Can pupils describe how we view a web page over the internet? Can pupils describe why the process of viewing a web page across the internet wouldn't work if any one of these devices was removed?	Linked to another curriculum area, children are given the opportunity to present their work. Pupil objectives: I can select a piece of work to present digitally. I can choose appropriate software for the piece of work I am presenting. I can demonstrate understanding of its use. I can explain why I used the software I chose. Teaching Assessment opportunities: Pupils choice of software for the work they are presenting. Are they using the software appropriately? Are there any additional needs identified? Are they using appropriate language consummate with their age and learning needs? Do they understand why this software works for them and others may not? **Then,** You're the Cyber Security Expert activity (Staff Share) In this lesson, pupils are challenged by a cyber security expert, to develop their knowledge of cyber-crime. As a class, pupils think about how a criminal might try and discover the secret number on a physical combination padlock and write an algorithm for this. Pupils subsequently apply this to a digital context, by exploring a program which illustrates how cyber criminals might use computers to try and discover secret numbers, such as pins, or even passwords. In doing so, pupils learn about the use of variables and conditional loops in code, and how to create stronger, more secure pins and passwords. PUPIL OBJECTIVES: Computer Science: I can write an algorithm. I can identify the need for variables. I can work with variables in my program. I can use a conditional loop in my program Digital Literacy: I can explain how to make passwords more secure TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of understanding during the lesson and assessment of pupils' completed programs. Key understanding to assess: Can pupils write the algorithm for finding the secret number for the combination lock? Is their approach systematic? Can pupils use their algorithm to correctly combine the commands? Can pupils work with variables? Can pupils use a conditional loop? Can pupils explain how to make more secure passwords?	Viking Raid Animation (Staff Share) Curriculum Links to: History Computer Science Concepts: Sequence, Programming Computational Thinking Concepts & Approaches: Collaborating, Debugging, Tinkering, Algorithms In this activity pupils program an animation of a Viking raid in Scratch. In doing so they learn that programming is the process of implementing algorithms as code and about the importance of sequencing commands. PUPIL OBJECTIVES: I can write a program with a sequence of instructions. TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of progress during the activity. Focus on: pupils' understanding of importance of correctly sequencing algorithm and code; their ability to correctly use the Scratch commands introduced; and that they can logically 'think through' their code to debug if required.
Vocabulary	Computer systems, networks, interconnectivity, connection, wiring, wireless, technology, information, data, transferring	Software, selection, choices, presentation, digital, sharing, security, Data, consent, sharing, terms and conditions, social media, platforms, user accounts, personal information, legacy	Logic, sequence, systematic, errors, debug, reasoning, simulation, decomposition, generalization, abstraction, variable, code, condition, evaluation, input, output, selection, sequence, repetition, loop, Coding, Scratch, Sprite, Sequence, command, algorithm, program, programming, input, output, steps, animation,
Project / Outcome	Understanding of the world wide web and difference to internet.	Sharing a piece of work with parents via Class Dojo	Viking animation coding

Spring 2

	Week 1, 2 & 3	Week 4, 5 & 6
LO	To be able to make effective searches and know which results to trust	
Resources	Selecting Search Activity (Staff Share) Curriculum Links to: English Computer Science Concepts: Search Technologies In this activity pupils learn about the basics of how search engines use web crawlers to index the world wide web (WWW). Pupils act like web crawlers themselves, indexing a very small portion of the WWW, and they then use this index to respond to search queries. PUPIL OBJECTIVES: I can explain how search engines select results. TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of pupils during main task and plenary. Focus on key understanding of how a search engine's select results, e.g: Search engines have an index of the WWW. These are created by web crawlers. Web crawlers move between web pages via links. They build up a search engine's index by taking copies of the pages they visit. When we make a search, a search engine looks up our keyword in its index to determine what pages to return in the results. Assessment of pupils' search engines' indexes.	Ranking Search Activity (Staff Share) Curriculum Links to: English Computer Science Concepts: Search Technologies This is an unplugged activity in which pupils learn about some of the main factors which influence how a search engine ranks a web page. Pupils create paper-based 'web pages' in groups on a current topic they are studying. They then discover how their web pages would rank when searching for keywords relating to their content. PUPIL OBJECTIVES: I can explain how search engines rank results TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of pupils during main task and plenary. Focus on key understanding of how a search engine's rank results, e.g: Search engine's algorithms assess a variety of factors to determine how a page ranks. Factors which affect ranking include the web page's content and the number of inbound links to a page.
Vocabulary	Search, search engine, index, world wide web, search query, Boolean search, results, pages, keywords, algorithms, ranking, links, search engine optimisation, manipulation, reliability, trust, paid for advertising,	
Project / Outcome	Extension activities: Investigation: How do we know what search results to trust? How can I tell if the source is reliable? How does Search Engine Optimisation (SEO) on a website help it to appear higher in rankings? Can search results be manipulated? Can I trust paid for advertisements and rankings?	

Summer 1

	Week 1, 2, 3, 4 & 5	Week 6 & 7
LO	To understand how to design, write and debug programs to achieve specific goals.	
Resources	Pizza Party (Staff Share) Curriculum Links to: D&T, Maths, Languages. Computer Science Concepts: Search Technologies. Computational Thinking Concepts & Approaches: evaluation, debugging, creating, collaborating, algorithms. There are five lesson plans and accompanying materials covering the collection, analysis and evaluation of data. With Italy as the core theme, pupils will develop their practical computational skills in online research and modelling using spreadsheets. To top things off, they will celebrate their efforts with a class pizza party! PUPIL OBJECTIVES: I can search the internet effectively for information about a topic and understand copyright I understand how spreadsheets can help me to solve problems, and am familiar with the spreadsheet modelling cycle I can collect and enter data values into a spreadsheet, and predict what a change to a spreadsheet will do I can follow a recipe algorithm to create a pizza I can evaluate my own work, and the work of other pupils TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of progress during the lessons and formal, summative assessment of spreadsheets produced. Focus on: pupil research and presentations, data entry, maths and spreadsheet work, ability to follow algorithms to make pizzas, and evaluation of work. Peer assessment of presentations and completed pizzas.	Scratch Maths Quiz Selection (Staff Share) Curriculum Links to: Maths. Computer Science Concepts: Selection, Programming. Computational Thinking Concepts & Approaches: Debugging & collaborating In this activity pupils create a maths quiz in Scratch and learn about selection. In this activity selection allows the flow of the program to be altered depending on the player's answers to questions. Initially pupils will use an 'If… then…' selection command to make their quiz respond 'Well done' when the player answers correctly. Pupils then move on to using an 'If…then… else…' command so the program will also give the correct answer when the player gets an answer wrong. PUPIL OBJECTIVES: I can explain what selection is. I can write a program using selection TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of progress during main task, class discussions and plenary. Focus on pupil understanding of the concept of selection and the correct use of the two types selection commands in their program.
Vocabulary	Data, collection, analysis, evaluation, spreadsheet, solution, modelling, data values, prediction, algorithms Logic, sequence, systematic, errors, debug, reasoning, simulation, decomposition, generalization, abstraction, variable, code, condition, evaluation, input, output, selection, sequence, repetition, loop, Coding, Scratch, Sprite, Sequence, command, algorithm, program, programming, input, output, steps, animation,	Selection, program, command prompt, input, output, Logic, sequence, systematic, errors, debug, reasoning, simulation, decomposition, generalization, abstraction, variable, code, condition, evaluation, input, output, selection, sequence, repetition, loop, Coding, Scratch, Sprite, Sequence, command, algorithm, program, programming, input, output, steps, animation,
Project / Outcome	Pizza!	Scratch based maths quiz – saved for Summer 2

Summer 2

	Week 1 & 2	Week 3 & 4	Week 5, 6 & 7
LO		To be able to solve problems with coding programming	
Resources	Scratch Maths Quiz Variables (Staff Share) Curriculum Links to: Maths Computer Science Concepts: Variables, Selection, Programming. In this activity pupils learn about variables and how they can be used in programs. Pupils learn to use variables in Scratch to make a scoring system for the maths quiz they made in the introduction to selection activity (Use selection in programs – maths quiz). PUPIL OBJECTIVES: I can explain what a variable is. I can use variables in a program. TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of during main task, class discussions and plenary. Formal summative assessment of Scratch projects. Focus of assessment on understanding on what a variable is, and how it can be used in a program. This is evidenced by their use of code to alter their scoring variables.	Logical Number Sequencing (Staff Share) Curriculum Links to: Maths Computational Thinking Concepts & Approaches: Persevering, collaborating, logic, patterns, algorithms In this activity pupils explain the rule for a number sequence and predict which numbers come next. In doing so, they extend their knowledge of simple rule-based algorithms. They also use logical reasoning as they work out and explain their algorithms. PUPIL OBJECTIVES: I can use logical reasoning to explain how some simple algorithms work. TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of pupils' progress during main task, class discussion and plenary (focusing on asking pupils to explain the rule for a sequence and how they worked out the rule).	Code Cracking (Staff Share) Curriculum Links to: History, PSHE, English, Maths Computational Thinking Concepts & Approaches: Persevering, Debugging, Creating, Collaborating, Logic, Evaluation, Algorithms, Decomposition This unit of six lessons (choose 3) introduces pupils to the history of computing and, in particular, how computers were used as code-cracking devices in World War II. Pupils learn about Alan Turing and become code crackers themselves. They then create their own movie about code cracking. PUPIL OBJECTIVES: I can collaborate as part of a team, using logic and decomposition to solve code-cracking problems I can collaborate as a team to research, create and present a presentation about Alan Turing I can create a simple algorithm, in the form of a movie storyboard I can create the props, set and scripts for a movie I can tinker and use movie-making software and equipment to create a movie about code cracking I can present finished work to an audience and evaluate my own and others' work using specified criteria TEACHING ASSESSMENT OPPORTUNITIES: Informal teacher assessment of progress during the lessons (for example - deciphered code), and formal, summative assessment of movies produced. Focus on: fact files and presentations, storyboard algorithms, movies and evaluation sheets Peer assessment of presentations and completed movie
Vocabulary	Logic, sequence, systematic, errors, debug, reasoning, simulation, decomposition, generalization, abstraction, variable, code, condition, evaluation, input, output, selection, sequence, repetition, loop, Coding, Scratch, Sprite, Sequence, command, algorithm, program, programming, input, output, steps, animation,		
Project / Outcome	Children become problem solvers in computing technology that they are able to apply elsewhere.		

Glossary

Abstraction   Taking the detail out of a 'problem' to make it easier to solve

Algorithm   Steps to follow to achieve a task

Boolean   A variable whose value can only be true or false

Browser   A computer program used to access the World Wide Web

Checksum   The total number of packets sent to/from a router

Code   See Program

Computer   A device that takes input, processes it, then produces output

Computational Thinking   An analytical approach to 'problem' solving (involving abstraction, decomposition, logical thinking, pattern, evaluation, generalisation)

Condition   Something that is either true or false

CSS   Cascading Style Sheets – How web content is styled (Eg. font, colour etc.)

Debug   Finding and correcting errors

Data   Numbers that represent images, video, text and sound

Decomposition   Splitting things into smaller parts

Evaluation   Is this 'good'? Can it be improved?

FTP   File Transfer Protocol. A service for moving files

Function   A set of commands in computer programs that are grouped together and given a name so that they can be used more than once in a program

Generalisation   Adapting solutions already found to solve new problems

Hub   A device that joins a group of computers together

HTML   Hyper Text Markup Language: the 'code' used to create and lay out web pages

Information   Data processed and/or presented to users in a meaningful way. For example, a large list of numbers is meaningless unless it is presented as, say, the ages of pupils in a class

Input	A method of computers receiving data (Eg. keyboard, mouse, touch, sensors etc,)
Internet	A network of connected computers
IP Address	Numerical label assigned to each device on a computer network
ISP	Internet Service Provider. The company you pay to connect you to the Internet
LAN	Local Area Network. Computers connected together that are geographically close to each other (e.g. home or school)
Logical Reasoning/Thinking	Using rules to solve problems
Network	A group of computers that are connected (including the Internet)
Output	A response made by computers to the user (Eg. audio (sound), visual (images), motion)
Packet	Small pieces of data (text, pictures, sound)
Pattern	Finding and using repetition
Program	Instructions written in a language (code) computers can understand
Repetition	Instructions that can be repeated until a condition is met – i.e. a loop
Search	Finding data that satisfies condition(s)
Selection	A way in computer programs to make choices (e.g. IF..THEN)
Sequence	A set of instructions that are followed in order
Simulate	Using computers to imitate real-world scenarios
Software	Computer programs and applications (apps)
TCP/IP	Language computers use to communicate
URL	Uniform Resource Locator: a nickname (address) for a website
Variables	Names given to things we want the computer to store (remember). Eg. scores.
WAN	Wide Area Network. Computers connected together that are geographically far apart, even in different countries. The Internet is an example.
Web Server	A computer connected to the Internet that provides access to (hosts) websites

Web Site   A collection of web pages

World Wide Web (WWW)   All of the web pages on the Internet, accessed using a web browser

Wired   Devices that are connected using wires, usually cables

Wireless   Devices that are connected without wires or cables. They communicate via radio waves