Knowledge Ladders: COMPUTING

Key:

Retrieval of knowledge from prior year / learning

Greater Depth expectation

Knowledge Ladders Computing

Learning Strand	Year 1			
Year 1	**Computer science** Algorithms and programming, Data & Systems	**Information technology** Digital artefacts and Computing contexts	**Digital Literacy** Mechanics, Searching/Selecting Information	**Online safety** (part of Digital Literacy)
Autumn 1: Computing Systems and Networks – Technology Around Us **(NC 1.4, 1.5 & 1.6)**		Know how to identify technology Know what a computer is and its main parts Know how to use a mouse in different ways Know how to use a keyboard to type on a computer Know how to use the keyboard to edit text Know the rules for using technology responsibly		To retrieve facts I learnt last academic year. To complete a start of Year Quiz. To recognise behaviours that can upset others.
Autumn 2: Creating Media – Digital Painting **(NC 1.4)**		Know what different freehand tools do Know how to use the shape tool and the line tools Know to make careful choices when painting a digital picture Know why I chose the tools I used Know how to use a computer on my own to paint a picture Know how to make comparisons painting a picture on a computer and on paper		To know to speak to a trusted adult when upset by things online. To know rules that keep me safe online.
Spring 1: Programming A – Moving a Robot **(NC 1.1, 1.2, 1.3 & 1.5)**	Know what a given command will do Know how to act out a given word Know how to combine forwards and backwards commands to make a sequence Know how to combine four direction commands to make sequences Know how to plan a simple program Know how to find more than one solution to a problem			To know what my personal information is and that I keep it private.
Spring 2: Data and information- Grouping Data **(NC 1.4 & 1.6)**		Know how to label objects Know that objects can be counted Know how to describe objects in different ways Know how to count objects with the same properties Know how to compare groups of objects Know how to answer questions about groups of objects		To know I ask before sharing information online.
Summer 1:		Know how to use a computer to write Know how to add and remove text on a computer		To know work I create using technology belongs to me.

Knowledge Ladders Computing

Creating Media – Digital Writing **(NC 1.4 & 1.6)**		Know that the look of text can be changed on a computer Know to make careful choices when changing text Know why I used the tools that I chose Know how to compare typing on a computer to writing on paper	To know it is important to be polite in online communication.
Summer 2: Programming B – Introduction to Animation **(NC 1.1, 1.2, 1.3 & 1.4)**	Know how to choose a command for a given purpose Know that a series of commands can be joined together Know the effect of changing a value Know that each sprite has its own instructions Know how to design the parts of a project Know how to use my algorithm to create a program		To know how to search for information online To retrieve facts I have learnt through the year.

Vocabulary Expectations: Year 1:

CS: Algorithms, background, backwards, Bee-Bot, block/s, change, clear, command/s, delete, design, directions, effect, forwards, go, instructions, joining start block, left, plan, predict, program programming, programming area, programming blocks, reset, right, route, run, scratch Junior, sprite, turn, value

IT- Backspace, Bold, Brush size and style, Capital letters, Colour, Computers, Data set, Erase, Fewest, Fill, Font, Google Docs, Group, Image, Italic, Keyboard/ keys, Label, Less, Letters, Microsoft Word, More, Most, Numbers, Object, Paint program, Paintbrush, Primary colours, Search, Shape tools, Size, Spacebar, Text cursor, The same, Tool/ toolbar, Underline, Undo, Word processor

DL- Capital letter, Click and drag, Click/ Double-click, Computer, Drag, Draw, Full stop, Input device, Keyboard, Mouse/trackpad, Responsibly Technology. Safely, Screen, Shift, Space bar, Technology

Knowledge Ladders Computing

Learning Strand	Year 2			
Year 2	**Computer science** Algorithms and programming, Data & Systems	**Information technology** Digital artefacts and Computing contexts	**Digital Literacy** Mechanics, Searching/Selecting Information	**Online safety** (part of Digital Literacy)
Autumn 1: Computing Systems and Networks – IT Around Us **(NC 1.4, 1.5 & 1.6)**		Know the uses and features of information technology Know the uses of information technology in the school Know information technology beyond school Know how information technology helps us Know how to use information technology safely Know that choices are made when using information technology		To retrieve facts I learnt last academic year. To complete a start of Year Quiz. To know what bullying is and how it can hurt people
Autumn 2: Creating Media – Digital photography **(NC 1.4, 1.5 & 1.6)**		Know how to use a digital device to take a photograph Know how to make choices when taking a photograph Know what makes a good photograph Know how photographs can be improved Know how to use tools to change an image Know that photos can be changed		To know people my act differently online to off line. To say rules for keeping me safe online and how they keep me safe
Spring 1: Programming A – Robot Algorithms **(NC 1.1, 1.2, 1.3 & 1.4)**	Know how to describe a series of instructions as a sequence Know what happens when we change the order of instructions Know how to logical reasoning to predict the outcome of a program (series of commands) Know that programming projects can have code and artwork Know how to design an algorithm Know how to create and debug a program that I have written			I can explain what 'keeping things private' means and the rules for keeping my information private.
Spring 2: Data and information- Pictograms **(NC 1.4 & 1.6)**		Know that we can count and compare objects using tally charts Know that objects can be represented as pictures Know how to create a pictogram Know how to select objects by attribute and make comparisons Know that people can be described by attributes Know that we can present information using a computer		To know information put online lasts for a long time and can be seen by others
Summer 1: Creating media – Making Music **(NC 1.4)**		Know how music can make us feel Know that there are patterns in music Know how music is made from a series of notes Know how music is made from a series of notes		To know why other peoples work online belongs to them. To know how I can communicate with other online.

		Know how to create music for a purpose Know how to review and refine our computer work		
<u>Summer 2:</u> Programming B – An introduction to Quizzes **(NC 1.1, 1.2 & 1.3)**	Know that a sequence of commands has a start Know that a sequence of commands has an outcome Know how to create a program using a given design Know how to change a given design Know how to create a program using my own design Know how my project can be improved			I can use key words to find information using a search engine. To retrieve facts I have learnt through the year. To complete the end of Year quiz.

Vocabulary Expectations Year 2:

CS- Actions, Artwork, Build, Compare, Debugging, Evaluate, Features, Mat, Match, Modify, Order, Outcome, Sequence, Start, Unambiguous

IT- Block diagram, Camera, Capture, Common attribute, Compare, Conclusion, Create, Data, Device, Digital, Edit/ Editing, Enter, Field of view, Filter, Focal point, Focus, Focus background, Foreground, Format, Framing, Horizontal, Image/s, Instrument, Landscape/ Portrait, Natural/Artificial Lighting, Flash, Notes, Open, Organise, Pattern, Photograph, Pictogram, Pitch, Pixlr, Pulse/beat, Rhythm, Subject matter , Tally chart, Tempo, Vertical

DL- Barcode, Information technology (IT), Scanner/scan

Knowledge Ladders Computing

Learning Strand	YEAR 3			
Year 3	**Computer science** Algorithms and programming, Data & Systems	**Information technology** Digital artefacts and Computing contexts	**Digital Literacy** Mechanics, Searching/Selecting Information	**Online safety** (part of Digital Literacy)
<u>Autumn 1:</u> Computing Systems and Networks – Connecting Computers **(NC 2.2, 2.4 & 2.6)**	Know how digital devices function Know how to identify input and output devices Know how digital devices can change the way we work Know how to explain how a computer network can be used to share information Know how digital devices can be connected Know the physical components of a network			To retrieve facts I learnt last academic year. To complete a start of Year Quiz. To describe appropriate ways to behave online and give examples of bullying.
<u>Autumn 2:</u> Creating media- animation **(NC 2.6 & 2.7)**		Know that animation is a sequence of drawings or photographs Know how to relate animated movement with a sequence of images Know how to plan an animation Know and understand the need to work consistently and carefully Know how to review and improve an animation Know how to evaluate the impact of adding other media to an animation		To know what identity means and how I can represent myself in different ways online. To know how spending too long online can have a negative impact on someone.
<u>Spring 1:</u> Programming A- sequence in music **(NC 2.1, 2.2, 2.3 & 2.6)**	Know how to explore a new programming environment Know that commands have an outcome Know how to explain that a program has a start Know that a sequence of commands can have an order Know how to change the appearance of my project Know how to create a project from a task description			To know what a strong password is and why it is important.
<u>Spring 2:</u> Data & Information: Branching Database **(NC 2.6)**		Know how to create questions with yes/no answers Know how to identify the object attributes needed to collect relevant data Know how to create branching database Know how to explain why it is helpful for a database to be well structured		To know what sort of information I should and should not share online. To know why copying someone else work from the internet isn't fair.

		Know how to identify objects using a branching database Know how to compare the information shown in a pictogram with a branching database		
Summer 1: Creating media - desktop publishing **(NC 2.5 & 2.6)**	Know how text and images convey information Know that text and layout can be edited Know to choose appropriate page settings Know how to add content to a desktop publishing publication Know how different layouts can suit different purposes Know the benefits of desktop publishing			To know the difference between 'knowing' someone online and knowing them offline.
Summer 2: Programming B events and actions **(NC 2.1, 2.2, 2.3 & 2.6)**	Know how a sprite moves in an existing project Know how to create a program to move a sprite in four directions Know how to adapt a program to a new context Know how to develop my program by adding features Know how to identify and fix bugs in a program Know how to design and create a maze-based challenge			To use key phrases in a search engine to gather more accurate results To retrieve facts I have learnt through the year. To complete the end of Year quiz

Vocabulary Expectations: Year 3:

CS- Backdrop, Chord, Code, Costume, Errors, Event, Extension block, Glide, Logic, Motion, Note, Pen up, Point in direction, Run the code, Scratch, Set up, Stage, Task, Test

IT- Animation, Attribute, Branching database, Character, Communicate, Consistency, Copy, Database, Delete, Desktop publishing, Evaluation, Even, Events, Flip book, Information, Import, J2data, Layout, Onion skinning, Order, Paste, Photograph, Questions, Selecting, Separate, Sequence, Setting, Stop frame, Structure, Table, Template, Transition, Value

DL- Digital device, Input/ Output, Process, Program Connection Network, Network switch, Server, Wireless access point (WAP)

Knowledge Ladders Computing

Learning Strand	YEAR 4			
Year 4	**Computer science** Algorithms and programming, Data & Systems	**Information technology** Digital artefacts and Computing contexts	**Digital Literacy** Mechanics, Searching/Selecting Information	**Online safety** (part of Digital Literacy)
Autumn 1: Computing systems and networks – The internet **(NC 2.4, 2.5, 2.6 & 2.7)**	Know how networks physically connect to other networks Know how networked devices make up the internet Know how websites can be shared via the World Wide Web (WWW) Know how content can be added and accessed on the World Wide Web (WWW) Know how the content of the WWW is created by people Know how to evaluate the consequences of unreliable content			To retrieve facts I learnt last academic year. To complete a start of Year Quiz. To be able to describe ways people can be bullied online.
Autumn 2: Creating media – Audio editing **(NC 2.5, 2.6 & 2.7)**		Know that sound can be digitally recorded Know a digital device to record sound Know how to explain that a digital recording is stored as a file Know that audio can be changed through editing Know that different types of audio can be combined and played together Know how to evaluate editing choices made		To explain how I can change my identity when going online and why I might do this. To know times when I need to limit my amount of time on technology.
Spring 1: Programming A – Repetition in Shapes **(NC 2.1, 2.2, 2.3 & 2.6)**	Know that accuracy in programming is important Know how to create a program in a text-based language Know what 'repeat' means Know how to modify a count-controlled loop to produce a given outcome Know how to decompose a task into small steps Know how to create a program that uses count-controlled loops to produce a given outcome			To create strong passwords and to know devices collect information about me when I use them.
Spring 2: Data & Information: Data Logging **(NC 2.2 & 2.6)**	Know that data gathered over time can be used to answer questions Know to use a digital device to collect data automatically Know that a data logger collects 'data points' from sensors over time. Know that data is collected over a long duration to find information. Know to identify the data needed to answer questions Know to use collected data to answer questions.			To know how to find information about other by searching online.
Summer 1:	Know that digital images can be changed Know to change the composition of an image			To know save my work in a named folder so others know it belongs to me.

Knowledge Ladders Computing

Creating media – Photo editing **(NC 2.5 & 2.6, & 2.7)**	Know how images can be changed for different uses Know to make good choices when selecting different tools Know that not all images are real Know how changes can improve an image.			To know I need to be careful with who I trust to share information with online.
Summer 2: Programming B Repetition in Games **(NC 2.1, 2.2 & 2.3)**	Know how to use count-controlled loops in a different programming environment. Know that in programming there are infinite loops and count controlled loops Know how a design that includes two or more loops which run at the same time. Know an infinite loop in a given program. Know how to design a project that includes repetition. Know how to create a project that includes repetition.			To know how the internet is used to encourage us to buy things online. To retrieve facts I have learnt through the year. To complete the end of Year quiz

Vocabulary Expectations: Year 4:

CS- Code snippet, count controlled loop, Decompose, Duplicate, Event block, Forever, Infinite loop, Loop, Pattern, Procedure, Refine, Repeat, Repetition, Trace

IT- Audio, Analyse, Background/Foreground, Border, Brighten, Clone, Collection, Composition, Copyright, Crop, Cut, Data logger, Data point, Data set, Effects, Elements, Export, Fake/ Real, File, Flip, Headphones, Hue/saturation, Illustrator, Input/ Output, Input device, Interval, Layer, Logging, Magic wand, Microphone, Mixing, MP3, Original, Pause, Pixels, Playback, Podcast, Publication, Recolour, Record, Retouch, Review, Rotate, Save, Select/ Selection, Sensor, Sepia, Sharpen, Sound, Speaker, Start/ Stop, Time shift, Version, Vignette

DL- Accurate, Adverts, Browser, Content, Download, Files, Honest, Information, Internet, Internet Router, Links, Network security, Ownership, Permission, Route tracing, Router, Routing, Sharing, Use, Web address, Web page, Website, World Wide Web

Knowledge Ladders Computing

Learning Strand	YEAR 5			
Year 5	**Computer science** Algorithms and programming, Data & Systems	**Information technology** Digital artefacts and Computing contexts	**Digital Literacy** Mechanics, Searching/Selecting Information	**Online safety** (part of Digital Literacy)
Autumn 1: Computing systems and networks – Sharing information **(NC 2.1, 2.2, 2.4, 2.6 & 2.7)**	Know that computers can be connected together to form systems Know the role of computer systems in our lives Know how information is transferred over the internet Know how sharing information online lets people in different places work together Know how to contribute to a shared project online Know how to evaluate different ways of working together online			To retrieve facts I learnt last academic year. To complete a start of Year Quiz. To know how to get help for someone who is being bullied online. To know services to block abusive users.
Autumn 2: Creating media – Video editing **(NC 2.5, 2.6 & 2.7)**		Know what makes a video effective Know how to identify digital devices that can record video Know how to capture video using a range of techniques Know how to create a storyboard Know that video can be improved through reshooting and editing Know the impact of the choices made when making and sharing a video		To explain how online identity can be copied and altered. To describe ways technology can affect health and well-being both positively and negatively
Spring 1: Programming A - Selection in Physical Computing **(NC 2.1, 2.2, 2.3 & 2.6)**	Know how to control a simple circuit connected to a computer Know how to write a program that includes count-controlled loops Know that a loop can stop when a condition is met Know that a loop can be used to repeatedly check whether a condition has been met Know how to design a physical project that includes selection Know how to create a program that controls a physical computing project			To know strategies for creating and keeping strong passwords private. To describe ways that information about someone online can be used to make judgments about an them and why these may be incorrect
Spring 2: Data & Information: Flat File Databases **(NC 2.5, 2.6)**	Know how to use a form to record information. Know how to compare paper and computer-based databases. Know how grouping and sorting data allows us to answer questions. Know tools can be used to select specific data. Know that computer programs can be used to compare data visually. Know how to apply my knowledge of a database to ask and answer real-world questions.			To describe why other people's work belongs to them.

Knowledge Ladders Computing

Summer 1: Creating Media Vector Drawing **(NC 2.6)**		Know that drawing tools can be used to produce different outcomes. Know how to create a vector drawing by combining shapes. Know how to use tools to achieve a desired effect. Know that vector drawings consist of layers. Know how to group objects to make them easier to work with. Know how to evaluate my vector drawing.		To describe strategies for safe and fun experiences in online social environments. To know that there are some people they communicate with online who may want to do them or their friends harm (includes sending nudes and semi-nudes referenced as pics).
Summer 2: Programming B Selection in Quizzes **(NC 2.1, 2.2, 2.3 & 2.6)**	Know how selection is used in computer programs. Know that a conditional statement connects a condition to an outcome. Know how selection directs the flow of a program. Know how to design a program which uses selection. Know how to create a program which uses selection. Know to evaluate my program			To explain key concepts including: data, information, fact opinion belief, true, false, valid, reliable and evidence. To know why some information they find online may not be honest, accurate or legal To retrieve facts I have learnt through the year. To complete the end of Year quiz.

Vocabulary Expectations: Year 5:

CS- Battery box, Components, Condition, Conditional statement – the linking together of a condition and output, Connect, Constructive, Crocodile clips, Crumble controller, False, Implement, Input, LED, Microcontroller, Motor, Output device, Selection, Share, Sparkle, Switch, True

IT- Alignment grid, Alternatives, Angle, AV (audio-visual), Axis, Camera angle, Capture, Chart, Content, Criteria, Dialogue, Duplicate, End credits, Field, Graph, Handles, Icons, Improvement, Microsoft Movie Maker, Pan, Paste, Presentation, Recording, Resize, Retake/reshoot (choose agreed language), Reuse, Script, Sort, Soundtrack, Storage, Storyboard, Tape, Tilt, Timeline, Title screen, Transitions, Trim/clip, Ungroup, Vector, Video techniques, special effects, Videographer, YouTuber, Zoom

DL- Address, Chat, Collaboration, Connection, Explore, Packet, Process, Protocol, Remix, Slide deck, System

Knowledge Ladders Computing

Learning Strand	YEAR 6			
Year 6	**Computer science** Algorithms and programming, Data & Systems	**Information technology** Digital artefacts and Computing contexts	**Digital Literacy** Mechanics, Searching/Selecting Information	**Online safety** (part of Digital Literacy)
Autumn 1: Computing systems and networks – Communication **(NC 2.1, 2.4, 2.5, 2.6 & 2.7)**	Know how to use a search engine Know how search engines select results Know how search results are ranked Know why the order of results is important, and to whom Know how we communicate using technology Know how to evaluate different methods of online communication			To retrieve facts I learnt last academic year. To complete a start of Year Quiz. To explain how to report online bullying on apps and platforms I use.
Autumn 2: Creating media – 3D modelling **(NC 2.6 & 2.7)**		Know how to use a computer to create and manipulate three-dimensional (3D) digital objects Know how to compare working digitally with 2D and 3D graphics Know how to construct a digital 3D model of a physical object Know that physical objects can be broken down into a collection of 3D shapes Know how to design a digital model by combining 3D objects Know how to develop and improve a digital 3D model		To describe ways the media an shape ideas about gender and know to reject inappropriate messages about gender I see online. To describe common systems that regulate age related content and describe their purpose.
Spring 1: Programming A – Variables in Games **(NC 2.1, 2.2, 2.3 & 2.6)**	Know a 'variable' as something that is changeable Know why a variable is used in a program Know how to improve a game by using variables Know how to design a project that builds on a given example Know how to use my design to create a project Know how to evaluate my project			To explain what app permissions are and give some examples from the technology I use. To describe simple ways to increase privacy on apps I use.
Spring 2: **Data & Information Spreadsheets** (NC 2.6)		Know questions which can be answered using data. Know that objects can be described using data. Know that formulas can be used to produce calculated data. Know how to apply formulas to data, including duplicating. Know how to create a spreadsheet to plan an event.		To explain strategies for creating a positive online reputation and ways I can protect my 'digital personality' and online reputation, including degrees of anonymity.

Knowledge Ladders Computing

		Know how to choose suitable ways to present data		
Summer 1: Creating media web page creation **(NC 2.5, 2.6 & 2.7)**	Know how to review an existing website and consider its structure. Know to plan the features of a web page. Know to consider the ownership and use of images (copyright) Know the need to preview pages Know the need for a navigation path Know the implications of linking to content owned by other people.			To recognise that the content on the internet may belong to other people. To explain their responsibilities for the well-being of others in their online social group. To explain how they would support others (including those who are having difficulties) online (includes sending nudes and semi-nudes as pics).
Summer 2: Programming B: Sensing (NC 2.1, 2.2, 2.3, 2.6	Know how to create a program to run on a controllable device Know how to explain that selection can control the flow of a program Know how to update a variable with a user input Know that a conditional statement to compare a variable to a value Know how to design a project that uses inputs and outputs on a controllable device Know how to develop a program to use inputs and outputs on a controllable device			To explain how search engines work and how results are selected and ranked. To define the terms 'influence', 'manipulation' and 'persuasion' and explain how they might encounter these online. To know how to identify, flag and report inappropriate content. To retrieve facts I have learnt through the year. To complete the end of Year quiz.

Vocabulary Expectations: Year 6:

CS- Accelerometer, Compass, Flashing, Improve, Make code, Microbit, Output, Process, Random, Step counter, USB, Variable

IT-2D, 3D object, 3D space, Breadcrumb trail, Browser, Cells, Columns, Data heading, Data item, Design, Dimensions, Embed, External link, Fair use, Formula, Google Sites, Header, Hole, Home page, Hyperlink, Hypertext Markup, Language (HTML) Web page, Implication, Layout, Lift, Logo, Media, Modify, Navigation, Operation, Placeholder, Preview, Range, Rows, Sigma, Spreadsheet, Subpage Web page

DL- BBC Newsround, Bing, Blog, Bot, Communication, Content creator, Crawler, DuckDuckGo. Email, Google, Index, Links, one-to-many, one-to-one, one-way, Optimisation, Private, Public, Ranking, refine, Search, Search engine, selection, SMS, Swisscows, Twitter, Two-way, Web crawlers, WhatsApp, Yahoo!, YouTube