|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Our school computing curriculum is based on the NCCE computing themes and Project Evolve.****This document provides a clear progression of skills/ knowledge to enable staff to implement computing in the best possible way to develop, support and challenge our pupils in this digital world.****There are 3 main areas of the computing curriculum:** **Information Technology, Computer Science and Digital Literacy.**

|  |  |  |
| --- | --- | --- |
| **Information Technology** | **Computer Science** | **Digital Literacy** |
| Some are taught discretely, and the rest is taught creatively within our cross curricular approach. These should be closely linked to Digital Literacy to ensure suitability for safety & audience | Computational Thinking is solving problems with or without a computer; ‘sequence’ then how can it be solved; ‘technical skills.’Programming-write algorithms and implement as code then debug. They evaluate & find best/most appropriate way to reach goal. | Developing effective strategies to navigate staying safe online by being aware of theirs & other’s behaviours, their influences & consequences. |
| Multimedia: * Word Processing/Typing
* Sound
* Presentations, Creating eBooks and Web Design
* Photography and Digital Art
* Creating Video
* Augmented Reality and Virtual Reality
* Animation

Data Handling | Computational Thinking/ Unplugged Coding/ProgrammingComputer Systems & Networks | Self-Image and IdentityOnline RelationshipsOnline ReputationOnline BullyingManaging Online Information Health, Wellbeing and Lifestyle Privacy and Security Copyright and Ownership |

**Computing is taught in explicit lessons, tinkering lessons, and is used in as many cross curricular ways as we can where it will enhance the teaching of our termly ‘enquiry based big questions.’** |
| **Nursery and Reception**By the end of EYFS, children should be able to:* Recognise that a range of technology is used in places such as homes and schools.
* Select and use technology for particular purposes.
 |
| **COMPUTING SYSTEMS & NETWORKS** | **CREATING MEDIA** | **DATA & INFORMATION** | **PROGRAMMING** |
| * To recognise some ways in which the internet can be used to communicate.
* To give examples of how I (might) use technology to communicate with people I know.
* To talk about how I can use the internet to find things out.
* To identify devices to use to access information on the internet.
* To give simple examples of how to find information (e.g., search engine, voice activated searching).
 | **Word processing*** To play on a touch screen game and use computers/keyboards/mouse in role play.
* To type letters with increasing confidence using a keyboard and tablet.
* To dictate short, clear sentences into a digital device.

**Ebooks*** To record my voice over a picture.
* To create a simple digital collage.
* To move and resize images with my fingers or mouse.

**Animation*** To animate a simple image to speak in role.
* To create a simple animation to tell a story including more than one character.

**Video*** To know the difference between a photography and video.
* To record a short film using the camera.
* To record and play a film.
* To watch films back.

**Photography*** To take a photograph.
* To take a photograph and use it in an app.
* To use a painting app and explore the paint and brush tools.

**Sounds*** To record sounds with different resources.
* To find ways to change your voice (tube, tin can, shouting to create an echo).
* To record sounds/voices in storytelling and explanations.
 | * To identify a chart.
* To sort physical objects, take a picture, and discuss what has been done.
* To present simple data on a digital device.
 | **Computational Thinking*** To follow simple oral algorithms.
* To spot simple patterns.
* To sequence simple familiar tasks.

**Programming*** To use a mouse, touch screen or appropriate access device to target and select options on screen.
* To input a simple sequence of commands to control a digital device with support (BeeBot).
 |
| Links to Characteristics of Effective Learning:Table  Description automatically generatedLinks to Prime Areas of Learning:Table  Description automatically generated with medium confidenceTable  Description automatically generated |
| **Key vocabulary** |
| Technology, computer, mouse, keyboard, iPad, phone, IWB, radio, CD Player, video player, MP3, traffic lights, robot, button, press, movement, internet, online, search, information, share, create, image/ picture, photo, animation, pattern, robot, instructions, record, paint, share, collect, sort, count, object, chart |
| **Year 1 and 2**By the end of KS1, children should be able to:* 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
* 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 on the internet or other online technologies
 |
|  | **COMPUTING SYSTEMS & NETWORKS** | **CREATING MEDIA** | **DATA & INFORMATION** | **PROGRAMMING** |
| **Year1** | **Technology around us**To identify technologyTo identify a computer and its main parts To use a mouse in different waysTo use a keyboard to typeTo use the keyboard to edit textTo create rules for using technology responsibly | **Digital painting**To describe what different freehand tools do To use the shape tool and the line toolsTo make careful choices when painting a digital picture To explain why I chose the tools I usedTo use a computer on my own to paint a pictureTo compare painting a picture on a computer and on paper**Digital writing**To use a computer to writeTo add and remove text on a computerTo identify that the look of text can be changed on a computerTo make careful choices when changing text To explain why I used the tools that I choseTo compare writing on a computer with writing on paper | **Grouping data**To label objectsTo identify that objects can be counted To describe objects in different waysTo count objects with the same properties To compare groups of objectsTo answer questions about groups of objects | **Moving a robot**To explain what a given command will do To act out a given wordTo combine forwards and backwards commands to make a sequenceTo combine four direction commands to make sequences To plan a simple programTo find more than one solution to a problem**Introduction to animation**To choose a command for a given purposeTo show that a series of commands can be joined together To identify the effect of changing a valueTo explain that each sprite has its own instructions To design the parts of a projectTo use my algorithm to create a program |
| **Year2** | **Information technology around us**To recognise the uses and features of information technologyTo identify information technology in the home To identify information technology beyond schoolTo explain how information technology benefits us To show how to use information technology safelyTo recognise that choices are made when using information technology | **Digital photography**To know what devices can be used to take photographs To use a digital device to take a photographTo describe what makes a good photograph To decide how photographs can be improved To use tools to change an imageTo recognise that images can be changed**Making music**To say how music can make us feelTo identify that there are patterns in musicTo describe how music can be used in different ways To show how music is made from a series of notes To create music for a purposeTo review and refine our computer work | **Pictograms**To recognise that we can count and compare objects using tally chartsTo recognise that objects can be represented as pictures To create a pictogramTo select objects by attribute and make comparisonsTo recognise that people can be described by attributesTo explain that we can present information using a computer | **Robot algorithms**To describe a series of instructions as a sequenceTo explain what happens when we change the order of instructionsTo use logical reasoning to predict the outcome of a program (series of commands)To explain that programming projects can have code and artworkTo design an algorithmTo create and debug a program that I have written**Introduction to quizzes**To explain that a sequence of commands has a startTo explain that a sequence of commands has an outcome To create a program using a given designTo change a given designTo create a program using my own design To decide how my project can be improved |
| **Key vocabulary** |
| **Year1** | trackpaddouble-clicktyping | paint programtoolpaintbrusherasefillundo shape/ line/ fill toolsbrush style/ size | word processorkeyboardkeyslettersMicrosoft Wordnumbersspacebackspacetext cursorcapital letterstoolbarbold, italic, underlinefontmouse | objectlabel groupsearchimagepropertycolour, size, shapevaluedata setmore/less, most/ fewest/ the same | forwardsbackwardsturncleargocommandsinstructionsdirectionsleft rightplanalgorithmprogramrouteplan | ScratchJrbee-botspritecompareprogrammingblockjoiningstart blockrunbackgroundresetpredicteffectchangevaluedelete |
| **Year2** | information technologybarcodescanner/ scan | devicecameraphotographcaptureimagedigitallandscapeportraitframingsubject composelight sourcesflashfocusbackgroundeffectsfilterformat | musicfeelings, emotionspatternrhythmpulse/ beatpitchtemponotesinstrumentcreateopenedit | more than/ less thanmost/ leastorganisedataobjecttally chartvotestotalprogramenterdatacomparecountexplainmore common/ least commonattributegroupsame/ differentmost/ least popularconclusionblock diagramsharing | sequenceclearunambiguousprogramsequenceorder predictiondesignroutedebugging | commandoutcomeactionsmodifychangebuildmatchfeaturesevaluation |
| **Year 3 and 4**By the end of lower KS2, children should be beginning to:* Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
* Use sequence, selection, and repetition in programs, work with variables and various forms of input and output
* Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
* Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration
* Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
* Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including 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
 |
|  | **COMPUTING SYSTEMS & NETWORKS** | **CREATING MEDIA** | **DATA & INFORMATION** | **PROGRAMMING** |
| **Year3** | **Connecting computers**To explain how digital devices function To identify input and output devicesTo recognise how digital devices can change the way we workTo explain how a computer network can be used to share informationTo explore how digital devices can be connected To recognise the physical components of a network | **Stop-frame animation**To explain that animation is a sequence of drawings or photographsTo relate animated movement with a sequence of images To plan an animationTo identify the need to work consistently and carefully To review and improve an animationTo evaluate the impact of adding other media to an animation**Desktop publishing**To recognise how text and images convey information To recognise that text and layout can be editedTo choose appropriate page settingsTo add content to a desktop publishing publicationTo consider how different layouts can suit different purposes To consider the benefits of desktop publishing | **Branching databases**To create questions with yes/no answersTo identify the object attributes needed to collect relevant dataTo create a branching databaseTo identify objects using a branching databaseTo explain why it is helpful for a database to be well structuredTo compare the information shown in a pictogram with a branching database | **Sequence in music**To explore a new programming environmentI can identify that each sprite is controlled by the commands I chooseTo explain that a program has a startTo recognise that a sequence of commands can have an orderTo change the appearance of my project To create a project from a task description**Events and actions**To explain how a sprite moves in an existing project To create a program to move a sprite in four directions To adapt a program to a new contextTo develop my program by adding features To identify and fix bugs in a programTo design and create a maze-based challenge |
| **Year4** | **The internet**To describe how networks physically connect to other networksTo recognise how networked devices make up the internet To outline how websites can be shared via the World Wide WebTo describe how content can be added and accessed on the World Wide WebTo recognise how the content of the WWW is created by peopleTo evaluate the consequences of unreliable content | **Audio editing**To identify that sound can be digitally recorded To use a digital device to record soundTo explain that a digital recording is stored as a fileTo explain that audio can be changed through editingTo show that different types of audio can be combined and played togetherTo evaluate editing choices made**Photo editing**To explain that digital images can be changed To change the composition of an imageTo describe how images can be changed for different uses To make good choices when selecting different toolsTo recognise that not all images are realTo evaluate how changes can improve an image | **Data logging**To explain that data gathered over time can be used to answer questionsTo use a digital device to collect data automaticallyTo explain that a data logger collects ‘data points’ from sensors over timeTo use data collected over a long duration to find information To identify the data needed to answer questionsTo use collected data to answer questions | **Repetition in shapes**To identify that accuracy in programming is important To create a program in a text-based languageTo explain what ‘repeat’ meansTo modify a count-controlled loop to produce a given outcomeTo decompose a program into partsTo create a program that uses count-controlled loops to produce a given outcome**Repetition in games**To develop the use of count-controlled loops in a different programming environmentTo explain that in programming there are infinite loops and count controlled loopsTo develop a design which includes two or more loops which run at the same timeTo modify an infinite loop in a given program To design a project that includes repetition To create a project that includes repetition |
| **Key vocabulary** |
| **Year3** | digital deviceinputoutputprocessdigital deviceconnectionnetworknetwork switchserverWireless Access Point (WAP) | animationflip bookstop frame animationframestoryboardsequenceimagephotographsettingcharactereventsonion skinningevaluationdeletemediaimport transition | textimagesadvantages/ disadvantagescommunicatefont styletemplateorientationplaceholderlayoutcontentdesktop publishingcopy pastepurposebenefits | attributevaluequestionstable branching databasedatabaseequal, even, separatestructureorderorganiseselectingpictograminformationdecision tree | Scratchcodecostumestagebackdropmotionturnpoint in directiongo toglideeventtaskrun the codenotechordbugdebug | logicmoveresizeextension blockpen upset uppeneventactionerrorssetuptest |
| **Year4** | internetrouternetwork securitywebsiteweb pageweb addressroutingroute tracingbrowserworld wide webcontentweb pagelinksfilescontentdownloadsharingownershippermissioninformationaccuratehonestadverts | audiorecordplaybackmicrophonespeakerheadphonesinputoutputstartpausestoppodcastsavefileopeneditselectionmixingtime shiftexportmp3evaluatefeedback | arrangedigitalcropundosavesearchcopyrightcompositionpixelscroprotateflipadjustmentseffectshue/saturationsepiaversionillustratorvignetteretouchrecolourmagic wandadjustsharpenbrightenfakealterbackgroundforegroundpublicationpublicationelementsborderlayer | datainput devicesensordata loggerloggingdata pointintervalanalysedata setimportexportcollectionconclusion | turtlecommandscode snippetlogo (see commands)patternrepeatrepetitioncount-controlled loop valuerepetitiontracedecomposeprocedure | loopvalueforeverinfinite loopcostumeanimateduplicatemodifydesignrefineevaluate |
| **Year 5 and 6**By the end of KS2, children should be able to:* Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
* Use sequence, selection, and repetition in programs, work with variables and various forms of input and output
* Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
* Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration
* Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
* Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including 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
 |
|  | **COMPUTING SYSTEMS & NETWORKS** | **CREATING MEDIA** | **DATA & INFORMATION** | **PROGRAMMING** |
| **Year5** | **Systems and Searching**To explain that computers can be connected together to form systemsTo recognise the role of computer systems in our livesTo identify how to use a search engineTo describe how search engines select resultsTo explain how search results are rankedTo recognise why the order of results is important, and to whom**new** | **Video editing**To recognise video as moving pictures, which can include audioTo identify digital devices that can record video To capture video using a digital deviceTo recognise the features of an effective videoTo identify that video can be improved through reshooting and editingTo consider the impact of the choices made when making and sharing a video**Vector drawing**To identify that drawing tools can be used to produce different outcomesTo create a vector drawing by combining shapes To use tools to achieve a desired effectTo recognise that vector drawings consist of layers To group objects to make them easier to work with To evaluate my vector drawing | **Flat-file databases**To use a form to record informationTo compare paper and computer-based databasesTo outline how grouping and then sorting data allows us to answer questionsTo explain that tools can be used to select specific dataTo explain that computer programs can be used to compare data visuallyTo apply my knowledge of a database to ask and answer real-world questions | **Selection in physical computing**To control a simple circuit connected to a computerTo write a program that includes count-controlled loopsTo explain that a loop can stop when a condition is met, e.g., number of timesTo conclude that a loop can be used to repeatedly check whether a condition has been metTo design a physical project that includes selectionTo create a controllable system that includes selection**Selection in games**To explain how selection is used in computer programsTo relate that a conditional statement connects a condition to an outcomeTo explain how selection directs the flow of a program To design a program which uses selectionTo create a program which uses selection To evaluate my program |
| **Year6** | **Communication& collaboration**To explain the importance of internet addressesTo recognise how data is transferred across the internetTo explain how sharing information online can help people to work togetherTo evaluate different ways of working together onlineTo recognise how we communicate using technologyTo evaluate different methods of online communication**new** | **Web page creation**To review an existing website and consider its structure To plan the features of a web pageTo consider the ownership and use of images (copyright) To recognise the need to preview pagesTo outline the need for a navigation pathTo recognise the implications of linking to content owned by other people**3D modelling**To use a computer to create and manipulate three- dimensional (3D) digital objectsTo compare working digitally with 2D and 3D graphics To construct a digital 3D model of a physical objectTo identify that, physical objects can be broken down into a collection of 3D shapesTo design a digital model by combining 3D objectsTo develop and improve a digital 3D model | **Spreadsheets**To identify questions which can be answered using data To explain that objects can be described using dataTo explain that formula can be used to produce calculated dataTo apply formulas to data, including duplicating To create a spreadsheet to plan an eventTo choose suitable ways to present data | **Variables in games**To define a ‘variable’ as something that is changeable To explain why a variable is used in a programTo choose how to improve a game by using variables To design a project that builds on a given example To use my design to create a projectTo evaluate my project**Sensing**To create a program to run on a controllable deviceTo explain that selection can control the flow of a program To update a variable with a user inputTo use a conditional statement to compare a variable to a valueTo design a project that uses inputs and outputs on a controllable deviceTo develop a program to use inputs and outputs on acontrollable device |
| **Key vocabulary** |
| **Year5** | systemconnectiondigitalinputprocessprotocoladdress packetchatexploreslide deckreuseremixcollaboration | vectordrawing toolsshapesobjectsiconstoolbarmoveresizecolourrotateduplicate/ copyorganizezoomselectrotatealignment gridhandlesmodifylayersfront, backorderungroupvector drawingreusemanipulate objectsimprovementevaluatealternatives | audiorecordingscriptsoundtrackdialoguecapturestoragetapeAV (audiovisual)videographer, video techniques: zoom, pan, tilt, anglelightingyoutuberaudio/soundcamera angleexportMicrosoft Movie Makersplittrim/ cliptitlesend creditstimelinetransitionsretake/ reshootspecial effectstitle screenexportconstructive feedbackGreenscreen | fieldsortordergroupsearchcriteriagraphchartaxiscomparefilterpresentation | microcontrollercrumblecontrollercomponentsLEDsparklecrocodile clipsbattery boxrepetition infinite loopoutput devicesmotorconditiontrue/ falseinput | selectionconditionoutcomesconditional statementimplement |
| **Year6** | search engineGoogle/ Bing/ Yahoo!, Swisscows, DuckDuckGorefineindexcrawlerbotrankingoptimisationweb crawlerscontent creatorselectionrankingcommunicationpublic/ privateone-way/ two-wayone-to-one/ one-to-manySMSemailWhatsAppblogTwitter | websiteweb pagebrowsermediaHypertext Markup Language (HTML)logolayoutheaderpurposecopyrightfair usehome pagepreviewgoogle sitesbreadcrumb trailnavigationhyperlinksubpageimplicationexternal linkembednavigation | spreadsheetdata headingdata set/ itemcellscolumnsrowsapplicationformatcommon attributeformulacalculationcell referenceoperationrangeduplicatesigmaproposegraphresultssoftware | variablechangenamevalueset eventtaskproject | micro: bitMakeCodeprocessflashingUSBconditionif then elserandomsensingaccelerometercompassdirectionnavigationstep counter |