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| **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/Programming  Computer Systems & Networks | Self-Image and Identity  Online Relationships  Online Reputation  Online Bullying  Managing 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 generated  Links 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 technology  To identify a computer and its main parts  To use a mouse in different ways  To use a keyboard to type  To use the keyboard to edit text  To create rules for using technology responsibly | | **Digital painting**  To describe what different freehand tools do  To use the shape tool and the line tools  To make careful choices when painting a digital picture  To explain why I chose the tools I used  To use a computer on my own to paint a picture  To compare painting a picture on a computer and on paper  **Digital writing**  To use a computer to write  To add and remove text on a computer  To identify that the look of text can be changed on a computer  To make careful choices when changing text  To explain why I used the tools that I chose  To compare writing on a computer with writing on paper | | | **Grouping data**  To label objects  To identify that objects can be counted  To describe objects in different ways  To count objects with the same properties  To compare groups of objects  To answer questions about groups of objects | | **Moving a robot**  To explain what a given command will do  To act out a given word  To combine forwards and backwards commands to make a sequence  To combine four direction commands to make sequences  To plan a simple program  To find more than one solution to a problem  **Introduction to animation**  To choose a command for a given purpose  To show that a series of commands can be joined together  To identify the effect of changing a value  To explain that each sprite has its own instructions  To design the parts of a project  To use my algorithm to create a program | |
| **Year2** | **Information technology around us**  To recognise the uses and features of information technology  To identify information technology in the home  To identify information technology beyond school  To explain how information technology benefits us  To show how to use information technology safely  To 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 photograph  To describe what makes a good photograph  To decide how photographs can be improved  To use tools to change an image  To recognise that images can be changed  **Making music**  To say how music can make us feel  To identify that there are patterns in music  To 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 purpose  To review and refine our computer work | | | **Pictograms**  To recognise that we can count and compare objects using tally charts  To recognise that objects can be represented as pictures  To create a pictogram  To select objects by attribute and make comparisons  To recognise that people can be described by attributes  To explain that we can present information using a computer | | **Robot algorithms**  To describe a series of instructions as a sequence  To explain what happens when we change the order of instructions  To use logical reasoning to predict the outcome of a program (series of commands)  To explain that programming projects can have code and artwork  To design an algorithm  To create and debug a program that I have written  **Introduction to quizzes**  To explain that a sequence of commands has a start  To explain that a sequence of commands has an outcome  To create a program using a given design  To change a given design  To create a program using my own design  To decide how my project can be improved | |
| **Key vocabulary** | | | | | | | | | |
| **Year1** | trackpad  double-click  typing | | paint program  tool  paintbrush  erase  fill  undo  shape/ line/ fill tools  brush style/ size | word processor  keyboard  keys  letters  Microsoft Word  numbers  space  backspace  text cursor  capital letters  toolbar  bold, italic, underline  font  mouse | | object  label  group  search  image  property  colour, size, shape  value  data set  more/less, most/ fewest/ the same | | forwards  backwards  turn  clear  go  commands  instructions  directions  left  right  plan  algorithm  program  route  plan | ScratchJr  bee-bot  sprite  compare  programming  block  joining  start block  run  background  reset  predict  effect  change  value  delete |
| **Year2** | information technology  barcode  scanner/ scan | | device  camera  photograph  capture  image  digital  landscape  portrait  framing  subject  compose  light sources  flash  focus  background  effects  filter  format | music  feelings, emotions  pattern  rhythm  pulse/ beat  pitch  tempo  notes  instrument  create  open  edit | | more than/ less than  most/ least  organise  data  object  tally chart  votes  total  program  enter  data  compare  count  explain  more common/ least common  attribute  group  same/ different  most/ least popular  conclusion  block diagram  sharing | | sequence  clear  unambiguous  program  sequence  order  prediction  design  route  debugging | command  outcome  actions  modify  change  build  match  features  evaluation |
| **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 devices  To recognise how digital devices can change the way we work  To explain how a computer network can be used to share information  To 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 photographs  To relate animated movement with a sequence of images  To plan an animation  To identify the need to work consistently and carefully  To review and improve an animation  To 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 edited  To choose appropriate page settings  To add content to a desktop publishing publication  To consider how different layouts can suit different purposes  To consider the benefits of desktop publishing | | | **Branching databases**  To create questions with yes/no answers  To identify the object attributes needed to collect relevant data  To create a branching database  To identify objects using a branching database  To explain why it is helpful for a database to be well structured  To compare the information shown in a pictogram with a branching database | | **Sequence in music**  To explore a new programming environment  I can identify that each sprite is controlled by the commands I choose  To explain that a program has a start  To recognise that a sequence of commands can have an order  To 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 context  To develop my program by adding features  To identify and fix bugs in a program  To design and create a maze-based challenge | |
| **Year4** | **The internet**  To describe how networks physically connect to other networks  To recognise how networked devices make up the internet  To outline how websites can be shared via the World Wide Web  To describe how content can be added and accessed on the World Wide Web  To recognise how the content of the WWW is created by people  To evaluate the consequences of unreliable content | | **Audio editing**  To identify that sound can be digitally recorded  To use a digital device to record sound  To explain that a digital recording is stored as a file  To explain that audio can be changed through editing  To show that different types of audio can be combined and played together  To evaluate editing choices made  **Photo editing**  To explain that digital images can be changed  To change the composition of an image  To describe how images can be changed for different uses  To make good choices when selecting different tools  To recognise that not all images are real  To evaluate how changes can improve an image | | | **Data logging**  To explain that data gathered over time can be used to answer questions  To use a digital device to collect data automatically  To explain that a data logger collects ‘data points’ from sensors over time  To use data collected over a long duration to find information  To identify the data needed to answer questions  To 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 language  To explain what ‘repeat’ means  To modify a count-controlled loop to produce a given outcome  To decompose a program into parts  To 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 environment  To explain that in programming there are infinite loops and count controlled loops  To develop a design which includes two or more loops which run at the same time  To 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 device  input  output  process  digital device  connection  network  network switch  server  Wireless Access Point (WAP) | | animation  flip book  stop frame animation  frame  storyboard  sequence  image  photograph  setting  character  events  onion skinning  evaluation  delete  media  import  transition | text  images  advantages/ disadvantages  communicate  font style  template  orientation  placeholder  layout  content  desktop publishing  copy  paste  purpose  benefits | | attribute  value  questions  table  branching database  database  equal, even, separate  structure  order  organise  selecting  pictogram  information  decision tree | | Scratch  code  costume  stage  backdrop  motion  turn  point in direction  go to  glide  event  task  run the code  note  chord  bug  debug | logic  move  resize  extension block  pen up  set up  pen  event  action  errors  setup  test |
| **Year4** | internet  router  network security  website  web page  web address  routing  route tracing  browser  world wide web  content  web page  links  files  content  download  sharing  ownership  permission  information  accurate  honest  adverts | | audio  record  playback  microphone  speaker  headphones  input  output  start  pause  stop  podcast  save  file  open  edit  selection  mixing  time shift  export  mp3  evaluate  feedback | arrange  digital  crop  undo  save  search  copyright  composition  pixels  crop  rotate  flip  adjustments  effects  hue/saturation  sepia  version  illustrator  vignette  retouch  recolour  magic wand  adjust  sharpen  brighten  fake  alter  background  foreground  publication  publication  elements  border  layer | | data  input device  sensor  data logger  logging  data point  interval  analyse  data set  import  export  collection  conclusion | | turtle  commands  code snippet  logo (see commands)  pattern  repeat  repetition  count-controlled loop value  repetition  trace  decompose  procedure | loop  value  forever  infinite loop  costume  animate  duplicate  modify  design  refine  evaluate |
| **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 systems  To recognise the role of computer systems in our lives  To identify how to use a search engine  To describe how search engines select results  To explain how search results are ranked  To recognise why the order of results is important, and to whom  **new** | | **Video editing**  To recognise video as moving pictures, which can include audio  To identify digital devices that can record video  To capture video using a digital device  To recognise the features of an effective video  To identify that video can be improved through reshooting and editing  To 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 outcomes  To create a vector drawing by combining shapes  To use tools to achieve a desired effect  To 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 information  To compare paper and computer-based databases  To outline how grouping and then sorting data allows us to answer questions  To explain that tools can be used to select specific data  To explain that computer programs can be used to compare data visually  To 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 computer  To write a program that includes count-controlled loops  To explain that a loop can stop when a condition is met, e.g., number of times  To conclude that a loop can be used to repeatedly check whether a condition has been met  To design a physical project that includes selection  To create a controllable system that includes selection  **Selection in games**  To explain how selection is used in computer programs  To relate that a conditional statement connects a condition to an outcome  To explain how selection directs the flow of a program  To design a program which uses selection  To create a program which uses selection  To evaluate my program | |
| **Year6** | **Communication& collaboration**  To explain the importance of internet addresses  To recognise how data is transferred across the internet  To explain how sharing information online can help people to work together  To evaluate different ways of working together online  To recognise how we communicate using technology  To 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 page  To consider the ownership and use of images (copyright)  To recognise the need to preview pages  To outline the need for a navigation path  To 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 objects  To compare working digitally with 2D and 3D graphics  To construct a digital 3D model of a physical object  To identify that, physical objects can be broken down into a collection of 3D shapes  To design a digital model by combining 3D objects  To 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 data  To explain that formula can be used to produce calculated data  To apply formulas to data, including duplicating  To create a spreadsheet to plan an event  To 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 program  To 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 project  To evaluate my project  **Sensing**  To create a program to run on a controllable device  To explain that selection can control the flow of a program  To update a variable with a user input  To use a conditional statement to compare a variable to a value  To design a project that uses inputs and outputs on a controllable device  To develop a program to use inputs and outputs on a  controllable device | |
| **Key vocabulary** | | | | | | | | | |
| **Year5** | system  connection  digital  input  process  protocol  address  packet  chat  explore  slide deck  reuse  remix  collaboration | | vector  drawing tools  shapes  objects  icons  toolbar  move  resize  colour  rotate  duplicate/ copy  organize  zoom  select  rotate  alignment grid  handles  modify  layers  front, back  order  ungroup  vector drawing  reuse  manipulate objects  improvement  evaluate  alternatives | audio  recording  script  soundtrack  dialogue  capture  storage  tape  AV (audiovisual)  videographer, video techniques: zoom, pan, tilt, angle  lighting  youtuber  audio/sound  camera angle  export  Microsoft Movie Maker  split  trim/ clip  titles  end credits  timeline  transitions  retake/ reshoot  special effects  title screen  export  constructive feedback  Greenscreen | | field  sort  order  group  search  criteria  graph  chart  axis  compare  filter  presentation | | microcontroller  crumble  controller  components  LED  sparkle  crocodile clips  battery box  repetition infinite loop  output devices  motor  condition  true/ false  input | selection  condition  outcomes  conditional statement  implement |
| **Year6** | search engine  Google/ Bing/ Yahoo!, Swisscows, DuckDuckGo  refine  index  crawler  bot  ranking  optimisation  web crawlers  content creator  selection  ranking  communication  public/ private  one-way/ two-way  one-to-one/ one-to-many  SMS  email  WhatsApp  blog  Twitter | | website  web page  browser  media  Hypertext Markup Language (HTML)  logo  layout  header  purpose  copyright  fair use  home page  preview  google sites  breadcrumb trail  navigation  hyperlink  subpage  implication  external link  embed  navigation | | | spreadsheet  data heading  data set/ item  cells  columns  rows  application  format  common attribute  formula  calculation  cell reference  operation  range  duplicate  sigma  propose  graph  results  software | | variable  change  name  value  set  event  task  project | micro: bit  MakeCode  process  flashing  USB  condition  if then else  random  sensing  accelerometer  compass  direction  navigation  step counter |