Science & Technology

Deanwood Computing

Curriculum 2023-24

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Science & Technology aims to deepen a respect and sense of wonder for the world through practical activity and a developing inquisitive nature. Science & Technology curriculum comprises of:

- Science
- Design & Technology
- Computing

Deanwood School Values

Our Science & Technology Curriculum underpins our school values in the follow way:

Happy exploring the possibilities of their imagination, whilst discovering the scientific outcomes and putting these to use in computing, design and technology and science.

Successful To be challenging and spark excitement - unlocking the potential. Learners, taking initial ideas through the technical and scientific processes to outcomes that inspire and are celebrated.

Safe children can experiment with technology and implement their findings. Thus learning the importance of independent and team work which are vital in creating inspirational projects.

How Do We Teach Computing?

We have the scheme '*Teach Computing*' which supports teacher's subject knowledge and scaffolds the learning.

The Teaching of Computing follows a specific routemap which builds up the knowledge of their unit in small steps.

1. Re-Activating

The term will begin with the children recapping on previous knowledge, both from previous years and from previous units in this academic year. The Learning Journey Map is used to show the children where they have been and where their learning is going.

2. Explore Real World Concepts

The first stage is looking at computing in the real world and its applications. This allows the children to understand the concepts around the unit. It will show the pupils the fundamental groundwork of the unit and what they will be learning about. They will be introduced to the concepts and ideas.

Lead with concepts

Support pupils in the acquisition of knowledge, through the use of key concepts, terms, and vocabulary, providing opportunities to build a shared and consistent understanding. Glossaries, concept maps, and displays, along with regular recall and revision, can support this approach.

Unplug, unpack, repack

Teach new concepts by first unpacking complex terms and ideas, exploring these ideas in unplugged and familiar contexts, then repacking this new understanding into the original concept. This approach, called 'semantic waves', can help pupils develop a secure understanding of complex concepts

3. Developing the Knowledge

The pupils will developing an understanding of the computing concepts and how the programming work. The learning will be practical and allow the pupils to experiment and work together in exploring these concepts. Over the course of the topic, they will become more familiar with the concept and how it works.

Model everything

Model processes or practices — everything from debugging code to binary number conversions — using techniques such as worked examples and live coding. Modelling is particularly beneficial to novices, providing scaffolding that can be gradually taken away.

Get hands-on

Use physical computing and making activities that offer tactile and sensory experiences to enhance learning. Combining electronics and programming with arts and crafts (especially through exploratory projects) provides pupils with a creative, engaging context to explore and apply computing concepts.

Challenge misconceptions

Use formative questioning to uncover misconceptions and adapt teaching to address them as they occur. Awareness of common misconceptions alongside discussion, concept mapping, peer instruction, or simple quizzes can help identify areas of confusion

Foster program comprehension

Use a variety of activities to consolidate knowledge and understanding of the function and structure of programs, including debugging, tracing, and Parson's Problems. Regular comprehension activities will help secure understanding and build connections with new knowledge

Read and explore code first

When teaching programming, focus first on code 'reading' activities, before code writing. With both block-based and text-based programming, encourage pupils to review and interpret blocks of code. Research has shown that being able to read, trace, and explain code augments pupils' ability to write code.

Work together

Encourage collaboration, specifically using pair programming and peer instruction, and also structured group tasks. Working together stimulates classroom dialogue, articulation of concepts, and development of shared understanding.

Add variety

Provide activities with different levels of direction, scaffolding, and support that promote learning, ranging from highly structured to more exploratory tasks. Adapting your instruction to suit different objectives will help keep all pupils engaged and encourage greater independence.

Structure lessons

Use supportive frameworks when planning lessons, such as PRIMM (*Predict, Run, Investigate, Modify, Make*) and (*Use-Modify-Create*). These frameworks are based on research and ensure that differentiation can be built in at various stages of the lesson.

4. Design & Make Activity

At the end of the unit, the pupils will be given the opportunities to apply their knowledge to demonstrate that they have made progress in their knowledge. As well, this, the children will be able to complete an end of term assessment to show their knowledge they have acquired.

Make concrete

Bring abstract concepts to life with real-world, contextual examples, and a focus on interdependencies with other curriculum subjects. This can be achieved through the use of unplugged activities, proposing analogies, storytelling around concepts, and finding examples of the concepts in pupils' lives.

Create projects

Use project-based learning activities to provide pupils with the opportunity to apply and consolidate their knowledge and understanding. Design is an important, often overlooked aspect of computing. Pupils can consider how to develop an artefact for a particular user or function, and evaluate it against a set of criteria.

Online Safety

IT is an important part of the curriculum in teaching the children how to keep themselves safe. We ensure that pupils understand their 'Digital Tattoo' and that children grown up in a world saturated with technology and advertising. Even from birth, children have a digital tattoo and we need to ensure that pupils are keeping yourself safe.

As part of our Safeguarding Curriculum, in the final week of every term, the classes undertake a lesson on Online safety, which looks at various aspects of the children's life in relation to the Four Cs:

Content	being exposed to illegal, inappropriate or harmful material
Contact	being subjected to harmful online interaction with other users
Conduct	personal online behaviour that increases the likelihood of, or causes, harm
Commerce	being exposed to online gambling, inappropriate advertising, phishing and or financial scams.

Teaching of Vocabulary

At the start of each lesson, the vocabulary for the session will be shared. The pupils will be taught the meanings and definitions of the words at the start of the lesson. At the end of the lesson, the target vocabulary will be recapped and the children will be able to share their learning and understanding of the vocabulary.

Knowledge Organisers

The pupils will all have a knowledge organiser which will give an overview of the learning and the vocabulary for the topic. The Knowledge organisers are referred back to throughout the lessons and so the children are familiar with the concepts.

How Do We Adapt Learning To Support Pupils In Computing?

Non-Negotiables that need to be in place in all lessons/classrooms when teaching

1. Dual coded displays/resources available to all pupils
2. Ensure outcomes are either open ended or pupils have a choice of how to present their work within that objective
3. All pupils given a means of expressing their view and opinions whether written, recorded, drawn etc.

Cognition and Learning

Subject Challenges	Provision for SEND
Accessing the programmes for the curriculum – understanding how to use them.	Differentiation in action during lessons Scaffolding or small group support with teacher/TA
Processing or cognitive difficulties including literacy needs	Choice of programme – using Sphero for voice coding/ drawing coding. Stem sentences / key vocabulary Screen readers

Communication and Interaction

Subject Challenges	Provision for SEND
Understanding order to complete the task Key vocabulary understanding and ability to process language	Visual representation of instructions/task Opportunities to work with or ask a friend or the teacher. Stem sentences / key vocabulary displayed clearly with dual coding Working collaboratively across different devices Google Translate for all websites Screen readers

Physical and sensory

Subject Challenges	Provision for SEND
Bright lights on the computer	Adjustable brightness
Noisy	Headphones available
websites/applications	Individual logins with
Font and font size	personalised font/font size
Keyboard skills	Voice to text add-ons

Social Emotional and Mental Health

Subject Challenges	Provision for SEND
Finding things tough – particularly when error messages occur or something doesn't work	If unsure, always click cancel
Internet safety	Clear instructions to support difficult processes
	Using programs that can help with mental health issues - Ollee

How Is The Computing Sequenced Throughout The School?

The Computing knowledge for the pupil is sequenced to build up not only in year but also in four key themes over each year.

Computing systems & Networks

Creating Media

Data & Information

Programming

	Key Theme 1 **Computing systems & Networks**	Key Theme 2 **Creating Media**		Key Theme 3 **Data and Information**	Key Theme 4 **Programming**	
N						
R						
1	**Technology around us** Recognising technology in school and using it responsibly.	**Digital painting** Choosing appropriate tools in a program to create art, and making comparisons with working non-digitally.	**Digital writing** Using a computer to create and format text, before comparing to writing non-digitally	**Grouping data** Exploring object labels, then using them to sort and group objects by properties.	**Moving a robot** Writing short algorithms and programs for floor robots, and predicting program outcomes.	**Programming animations** Designing and programming the movement of a character on screen to tell stories.
2	**Information technology around us** Identifying IT and how its responsible use improves our world in school and beyond.	**Digital photography** Capturing and changing digital photographs for different purposes.	**Digital music** Using a computer as a tool to explore rhythms and melodies, before creating a musical composition.	**Pictograms** Collecting data in tally charts and using attributes to organise and present data on a computer.	**Robot algorithms** Creating and debugging programs, and using logical reasoning to make predictions.	**Programming quizzes** Designing algorithms and programs that use events to trigger sequences of code to make an interactive quiz.
3	**Connecting computers** Identifying that digital devices have inputs, processes, and outputs, and how devices can be connected to make networks.	**Stop-frame animation** Capturing and editing digital still images to produce a stop-frame animation that tells a story	**Desktop publishing** Creating documents by modifying text, images, and page layouts for a specified purpose.	**Branching databases** Building and using branching databases to group objects using yes/no questions	**Sequencing sounds** Creating sequences in a block-based programming language to make music.	**Events and actions in programs** Writing algorithms and programs that use a range of events to trigger sequences of actions
4	**The internet** Recognising the internet as a network of networks including the WWW, and why we should evaluate online content.	**Audio production** Capturing and editing audio to produce a podcast, ensuring that copyright is considered.	**Photo editing** Manipulating digital images, and reflecting on the impact of changes and whether the required purpose is fulfilled.	**Data logging** Recognising how and why data is collected over time, before using data loggers to carry out an investigation.	**Repetition in shapes** Using a text-based programming language to explore count-controlled loops when drawing shapes.	**Repetition in games** Using a block-based programming language to explore count-controlled and infinite loops when creating a game.
5	**Systems and searching** Recognising IT systems in the world and how some can enable searching on the internet.	**Video production** Planning, capturing, and editing video to produce a short film.	**Introduction to vector graphics** Creating images in a drawing program by using layers and groups of objects.	**Flat-file databases** Using a database to order data and create charts to answer questions.	**Selection in physical computing** Exploring conditions and selection using a programmable microcontroller	**Selection in quizzes** Exploring selection in programming to design and code an interactive quiz.
6	**Communication and collaboration** Exploring how data is transferred by working collaboratively online.	**Webpage creation** Designing and creating webpages, giving consideration to copyright, aesthetics, and navigation.	**3D modelling** Planning, developing, and evaluating 3D computer models of physical objects.	**Introduction to spreadsheets** Answering questions by using spreadsheets to organise and calculate data.	**Variables in games** Exploring variables when designing and coding a game.	**Sensing movement** Designing and coding a project that captures inputs from a physical device.

These are delivered in the following Terms.

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 5
N						
R						
1	Computing systems and networks – Technology around us	Creating media – Digital painting	Programming A – Moving a robot	Data and information – Grouping data	Creating media – Digital writing	Programming B - Programming animations
2	Computing systems and networks – IT around us	Creating media – Digital photography	Programming A – Robot algorithms	Data and information – Pictograms	Creating media - Digital music	Programming B - Programming quizzes
3	Computing systems and networks – Connecting computers	Creating media - Stop-frame animation	Programming A - Sequencing sounds	Data and information – Branching databases	Creating media – Desktop publishing	Programming B - Events and actions in programs
4	Computing systems and networks – The Internet	Creating media - Audio production	Programming A – Repetition in shapes	Data and information – Data logging	Creating media – Photo editing	Programming B – Repetition in games
5	Computing systems and networks - Systems and searching	Creating media - Video production	Programming A – Selection in physical computing	Data and information – Flat-file databases	Creating media – Introduction to vector graphics	Programming B – Selection in quizzes
6	Computing systems and networks - Communication and collaboration	Creating media – Web page creation	Programming A – Variables in games	Data and information - Introduction to Spreadsheets	Creating media – 3D Modelling	Programming B - Sensing movement

Substantive (*Know…*) & Disciplinary (*Know how…*) Computing Knowledge

Assessment Question 1. What do the pupils need to learn? Assessment Question 2. What do the pupils understand?

Year N

C.N.1. Computer Systems and networks – Technology around us

i. ?

Vocabulary

?

C.N.2. Creating Media

i. ?

Vocabulary

?

C.N.3. Programming

i. ?

Vocabulary

?

C.N.4. Data and Information

i. ?

Vocabulary

?

Linked Texts

???

Year R

C.R.1. Computer Systems and networks – Technology around us

ii. ?

Vocabulary

?

C.R.2. Creating Media

i. ?

Vocabulary

?

C.R.3. Programming

i. ?

Vocabulary

?

C.R.4. Data and Information

i. ?

Vocabulary

?

Linked Texts

???

Year 1

National Curriculum – Computing

e. recognise common uses of information technology beyond school

C.1.1. Computer Systems and networks – Technology around us

III. Know what technology is
IV. know what a computer is and its main parts
V. Know how to use a mouse in different ways
VI. Know how to use a keyboard to type on a computer
VII. Know how to use the keyboard to edit text
VIII. Know how to create rules for using technology responsibly

Vocabulary
technology, computer, mouse, trackpad, keyboard, screen, double-click, typing.

d. use technology purposefully to create, organise, store, manipulate and retrieve digital content

C.1.2. Creating Media A - Digital Painting

II. Know what different freehand tools do
III. Know how to use the shape tool and the line tools
IV. Know how to make careful choices when painting a digital picture
V. Know why I chose the tools I used
VI. Know how to use a computer on my own to paint a picture
VII. Know how to compare painting a picture on a computer and on paper

Vocabulary
paint program, tool, paintbrush, erase, fill, undo, shape tools, line tool, fill tool, undo tool, colour, brush style, brush size, pictures, painting, computers

Creating Media B – Digital Writing

VIII. Know how to use a computer to write
IX. Know how to add and remove text on a computer
X. Know that the look of text can be changed on a computer
XI. Know how to make careful choices when changing text
XII. Know how to explain why I used the tools that I chose
XIII. Know how to compare typing on a computer to writing on paper

Vocabulary
word processor, keyboard, keys, letters, type, numbers, space, backspace, text cursor, capital letters, toolbar, bold, italic, underline, mouse, select, font, undo, redo, format, compare, typing, writing.

a. understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
b. create and debug simple programs
c. use logical reasoning to predict the behaviour of simple programs

C.1.3. Programming A – Moving a Robot

I. Know what a given command will do
II. Know how to act out a given word
III. Know how to combine forwards and backwards commands to make a sequence
IV. Know how to combine four direction commands to make sequences
V. Know how to plan a simple program
VI. Know how to find more than one solution to a problem

Vocabulary
Bee-Bot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program.

Programming B – Animations

VII. Know how to choose a command for a given purpose
VIII. Know that a series of commands can be joined together
IX. Know the effect of changing a value
X. Know how to explain that each sprite has its own instructions
XI. Know how to design the parts of a project
XII. Know how to use my algorithm to create a program

Vocabulary
ScratchJr, command, sprite, compare, programming, area, block, joining, start, run, program, background, delete, reset, algorithm, predict, effect, change, value, instructions, design.

C.1.4. Data and Information – Grouping Data

i. Know how to label objects
ii. Know how to identify that objects can be counted
iii. Know how to describe objects in different ways
iv. Know how to count objects with the same properties
v. Know how to compare groups of objects
vi. Know how to answer questions about groups of objects

Vocabulary
object, label, group, search, image, property, colour, size, shape, value, data set, more, less, most, fewest, least, the same

Linked Texts
???

Year 2

C.2.1. Computing systems and networks – IT around us

i. Know the uses and features of information technology
ii. Know the uses of information technology in the school
iii. Know information technology beyond school
iv. Know how information technology helps us
v. Know how to explain how to use information technology safely
vi. Know that choices are made when using information technology

Vocabulary
Information technology (IT), computer, barcode, scanner/scan

C.2.2. Creating media A – Digital photography

I. Know how to use a digital device to take a photograph
II. Know how to make choices when taking a photograph
III. Know how to describe what makes a good photograph
IV. Know how photographs can be improved
V. Know how to use tools to change an image
VI. Know that photos can be changed

Vocabulary
music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat, instrument, open, edit.

Creating media B - Digital music

VII. Know how music can make us feel
VIII. Know that there are patterns in music
IX. Know how to experiment with sound using a computer
X. Know how to use a computer to create a musical pattern
XI. Know how to create music for a purpose
XII. Know how to review and refine our computer work

Vocabulary
music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat, instrument, open, edit.

C.2.3. Programming A – Robot algorithms

I. Know how to describe a series of instructions as a sequence
II. Know what happens when we change the order of instructions
III. Know how to use logical reasoning to predict the outcome of a program
IV. Know that programming projects can have code and artwork
V. Know how to design an algorithm
VI. Know how to create and debug a program that I have written

Vocabulary
instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, artwork, design, route, mat, debugging, decomposition

Programming B - Programming quizzes

VII. Know that a sequence of commands has a start
VIII. Know that a sequence of commands has an outcome
IX. Know how to create a program using a given design
X. Know how to change a given design
XI. Know how to create a program using my own design
XII. Know how my project can be improved

Vocabulary
sequence, command, program, run, start, outcome, predict, blocks, design, actions, sprite, project, modify, change, algorithm, build, match, compare, debug, features, evaluate, decomposition, code.

C.2.4. Data and information – Pictograms

I. To recognise that we can count and compare objects using tally charts
II. To recognise that objects can be represented as pictures
III. To create a pictogram
IV. To select objects by attribute and make comparisons
V. To recognise that people can be described by attributes
VI. To explain that we can present information using a computer

Vocabulary
more than, less than, most, least, common, popular, organise, data, object, tally chart, votes, total, pictogram, enter, data, compare, objects, count, explain, attribute, group, same, different, conclusion, block diagram, sharing

Linked Texts
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Substantive (*Know…*) & Disciplinary (*Know how…*) **Computing** Knowledge

Assessment Question 1. What do the pupils need to learn? *Assessment Question 2. What do the pupils understand?*

Year 3

National Curriculum – Computing

d. 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

e. use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

C.3.1. Computing systems and networks - Connecting computers

I. To explain how digital devices function
II. To identify input and output devices
III. To recognise how digital devices can change the way we work
IV. To explain how a computer network can be used to share information
V. To explore how digital devices can be connected
VI. To recognise the physical components of a network

Vocabulary
digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets

f. 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

C.3.2. Creating media A - Stop-frame animation

I. To explain that animation is a sequence of drawings or photographs
II. To relate animated movement with a sequence of images
III. To plan an animation
IV. To identify the need to work consistently and carefully
V. To review and improve an animation
VI. To evaluate the impact of adding other media to an animation

Vocabulary
animation, flip book, stop-frame, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition.

Creating media B – Desktop publishing

VII. To recognise how text and images convey information
VIII. To recognise that text and layout can be edited
IX. To choose appropriate page settings
X. To add content to a desktop publishing publication
XI. To consider how different layouts can suit different purposes
XII. To consider the benefits of desktop publishing

Vocabulary
text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits.

a. design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

b. use sequence, selection, and repetition in programs; work with variables and various forms of input and output

c. use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

C.3.3. Programming A - Sequencing sounds

I. To explore a new programming environment
II. -To identify that commands have an outcome
III. -To explain that a program has a start
IV. -To recognise that a sequence of commands can have an order
V. -To change the appearance of my project
VI. -To create a project from a task description

Vocabulary
Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task, design, run the code, order, note, chord, algorithm, bug, debug, code.

Programming B - Events and actions in programs

VII. -To explain how a sprite moves in an existing project
VIII. -To create a program to move a sprite in four directions
IX. -To adapt a program to a new context
X. -To develop my program by adding features
XI. -To identify and fix bugs in a program
XII. -To design and create a maze-based challenge

Vocabulary
motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, action, debugging, errors, setup, code, test, debug, actions.

f. 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

C.3.4. Data and information – Branching databases

I. -To create questions with yes/no answers
II. -To identify the attributes needed to collect data about an object
III. -To create a branching database
IV. -To explain why it is helpful for a database to be well structured
V. -To plan the structure of a branching database
VI. -To independently create an identification tool

Vocabulary
attribute, value, questions, table, objects, branching, database, objects, equal, even, separate, structure, compare, order, organise, selecting, information, decision tree.

Linked Texts
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Year 4

C.4.1. Computing systems and networks – The Internet

I. -To describe how networks physically connect to other networks
II. -To recognise how networked devices make up the internet
III. -To outline how websites can be shared via the World Wide Web (WWW)
IV. -To describe how content can be added and accessed on the World Wide Web (WWW)
V. -To recognise how the content of the WWW is created by people
VI. -To evaluate the consequences of unreliable content

Vocabulary
internet, network, router, security, switch, server, wireless access point (WAP), website, web page, web address, routing, web browser, World Wide Web, content, links, files, use, download, sharing, ownership, permission, information, accurate, honest, content, adverts

C.4.2. Creating media A - Audio production

I. -To identify that sound can be recorded
II. -To explain that audio recordings can be edited
III. -To recognise the different parts of creating a podcast project
IV. -To apply audio editing skills independently
V. -To combine audio to enhance my podcast project
VI. -To evaluate the effective use of audio

Vocabulary
audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback.

Creating media B – Photo editing

VII. -To explain that the composition of digital images can be changed
VIII. -To explain that colours can be changed in digital images
IX. -To explain how cloning can be used in photo editing
X. -To explain that images can be combined
XI. -To combine images for a purpose
XII. -To evaluate how changes can improve an image

Vocabulary
image, edit, digital, crop, rotate, undo, save, adjustments, effects, colours, hue, saturation, sepia, vignette, image, retouch, clone, select, combine, made up, real, composite, cut, copy, paste, alter, background, foreground, zoom, undo, font.

C.4.3. Programming A – Repetition in shapes

I. -To identify that accuracy in programming is important
II. -To create a program in a text-based language
III. -To explain what 'repeat' means
IV. -To modify a count-controlled loop to produce a given outcome
V. -To decompose a task into small steps
VI. -To create a program that uses count-controlled loops to produce a given outcome

Vocabulary
Logo (programming environment), program, turtle, commands, code snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled loop, value, trace, decompose, procedure.

Programming B – Repetition in games

VII. -To develop the use of count-controlled loops in a different programming environment
VIII. -To explain that in programming there are infinite loops and count controlled loops
IX. -To develop a design that includes two or more loops which run at the same time
X. -To modify an infinite loop in a given program
XI. -To design a project that includes repetition
XII. -To create a project that includes repetition

Vocabulary
Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify, design, algorithm, debug, refine, evaluate.

C.4.4. Data and information – Data logging

I. -To explain that data gathered over time can be used to answer questions
II. -To use a digital device to collect data automatically
III. -To explain that a data logger collects 'data points' from sensors over time
IV. -To recognise how a computer can help us analyse data
V. -To identify the data needed to answer questions
VI. " -To use data from sensors to answer questions

Vocabulary
data, table, layout, input device, sensor, logger, logging, data point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.

Linked Texts
???

Year 5

National Curriculum – Computing

d. 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

e. use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

C.5.1. Computing systems and networks - Systems and searching

I. -To explain that computers can be connected together to form systems
II. -To recognise the role of computer systems in our lives
III. -To experiment with search engines
IV. -To describe how search engines select results
V. -To explain how search results are ranked
VI. -To recognise why the order of results is important, and to whom

Vocabulary
system, connection, digital, input, process, storage, output, search, search engine, refine, index, bot, ordering, links, algorithm, search engine optimisation (SEO), web crawler, content creator, selection, ranking.

f. 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

C.5.2. Creating media A - Video production

I. -To explain what makes a video effective
II. -To identify digital devices that can record video
III. -To capture video using a range of techniques
IV. -To create a storyboard
V. -To identify that video can be improved through reshooting and editing
VI. -To consider the impact of the choices made when making and sharing a video

Vocabulary
video, audio, camera, talking head, panning, close up, video camera, microphone, lens, mid-range, long shot, moving subject, side by side, angle (high, low, normal), static, zoom, pan, tilt, storyboard, filming, review, import, split, trim, clip, edit, reshoot, delete, reorder, export, evaluate, share

Creating media B – Introduction to vector graphics

I. -To identify that drawing tools can be used to produce different outcomes
II. -To create a vector drawing by combining shapes
III. -To use tools to achieve a desired effect
IV. -To recognise that vector drawings consist of layers
V. -To group objects to make them easier to work with
VI. -To apply what I have learned about vector drawings

Vocabulary
vector, drawing tools, object, toolbar, vector drawing, move, resize, colour, rotate, duplicate/copy, zoom, select, align, modify, layers, order, copy, paste, group, ungroup, reuse, reflection

a. design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

b. use sequence, selection, and repetition in programs; work with variables and various forms of input and output

c. use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

C.5.3. Programming A – Selection in physical computing

I. -To control a simple circuit connected to a computer
II. -To write a program that includes count-controlled loops
III. -To explain that a loop can stop when a condition is met
IV. -To explain that a loop can be used to repeatedly check whether a condition has been met
V. -To design a physical project that includes selection
VI. -To create a program that controls a physical computing project

Vocabulary
microcontroller, USB, components, connection, infinite loop, output component, motor, repetition, count-controlled loop, Crumble controller, switch, LED, Sparkle, crocodile clips, connect, battery box, program, condition, Input, output, selection, action, debug, circuit, power, cell, buzzer

Programming B – Selection in quizzes

I. -To explain how selection is used in computer programs
II. -To relate that a conditional statement connects a condition to an outcome
III. -To explain how selection directs the flow of a program
IV. -To design a program which uses selection
V. -To create a program which uses selection
VI. -To evaluate my program

Vocabulary
Selection, condition, true, false, count-controlled loop, outcomes, conditional statement, algorithm, program, debug, question, answer, task, design, input, implement, test, run, setup, operator

f. 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

C.5.4. Data and information – Flat-file databases

I. -To use a form to record information
II. -To compare paper and computer-based databases
III. -To outline how you can answer questions by grouping and then sorting data
IV. -To explain that tools can be used to select specific data
V. -To explain that computer programs can be used to compare data visually
VI. -To use a real-world database to answer questions

Vocabulary
database, data, information, record, field, sort, order, group, search, value, criteria, graph, chart, axis, compare, filter, presentation.

Linked Texts
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Year 6

C.6.1. Computing systems and networks - Communication and collaboration

I. -To explain the importance of internet addresses
II. -To recognise how data is transferred across the internet
III. -To explain how sharing information online can help people to work together
IV. -To evaluate different ways of working together online
V. -To recognise how we communicate using technology
VI. -To evaluate different methods of online communication

Vocabulary
communication, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, one-way, two-way, one-to-one, one-to-many.

C.6.2. Creating media A – Web page creation

I. -To review an existing website and consider its structure
II. -To plan the features of a web page
III. -To consider the ownership and use of images (copyright)
IV. -To recognise the need to preview pages
V. -To outline the need for a navigation path
VI. -To recognise the implications of linking to content owned by other people

Vocabulary
website, web page, browser, media, Hypertext Markup Language (HTML), logo, layout, header, media, purpose, copyright, fair use, home page, preview, evaluate, device, Google Sites, breadcrumb trail, navigation, hyperlink, subpage, evaluate, implication, external link, embed.

Creating media B – 3D Modelling

I. -To recognise that you can work in three dimensions on a computer
II. -To identify that digital 3D objects can be modified
III. -To recognise that objects can be combined in a 3D model
IV. -To create a 3D model for a given purpose
V. -To plan my own 3D model
VI. -To create my own digital 3D model

Vocabulary
TinkerCAD, 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, cube, cuboid, sphere, cone, prism, pyramid, placeholder, hollow, choose, combine, construct, evaluate, modify.

C.6.3. Programming A – Variables in games

I. -To define a 'variable' as something that is changeable
II. -To explain why a variable is used in a program
III. -To choose how to improve a game by using variables
IV. -To design a project that builds on a given example
V. -To use my design to create a project
VI. -To evaluate my project

Vocabulary
data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, spreadsheet, input, output, operation, range, duplicate, sigma, propose, question, data set, organised, chart, evaluate, results, sum, comparison, software, tools.

Programming B - Sensing movement

I. -To create a program to run on a controllable device
II. -To explain that selection can control the flow of a program
III. -To update a variable with a user input
IV. -To use a conditional statement to compare a variable to a value
V. -To design a project that uses inputs and outputs on a controllable device
VI. -To develop a program to use inputs and outputs on a controllable device

Vocabulary
data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, spreadsheet, input, output, operation, range, duplicate, sigma, propose, question, data set, organised, chart, evaluate, results, sum, comparison, software, tools.

C.6.4. Data and information – Spreadsheets

I. -To create a data set in a spreadsheet
II. -To build a data set in a spreadsheet
III. -To explain that formulas can be used to produce calculated data
IV. -To apply formulas to data
V. -To create a spreadsheet to plan an event
VI. -To choose suitable ways to present data

Vocabulary
data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, spreadsheet, input, output, operation, range, duplicate, sigma, propose, question, data set, organised, chart, evaluate, results, sum, comparison, software, tools.

Linked Texts
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How Do We Assess In Computing?

Assessment Question 1. What do I need to teach?

Curriculum Overview
The previous years knowledge is outlines in this Curriculum Booklet. We look back at the units in the themes and so they are able to see the previous learning.

Previous Learning
Staff are able to look at the pupils' books and the Assessment information in Arbor to see which children had met the expected standard and which would need additional support.

Assessment Question 2. What do the pupils understand?

Use of Questioning
Use of questioning to check whole class understanding - Avoiding closed questions

- Probing questions – finding out what the child and unpicking their thoughts
- Prompting questions – help direct pupils and draw attention to specific aspects
- Promoting questions – open ended sparking discussion and allow to explore and deepen thinking

Live Feedback
All staff give in the moment marking/feedback is in the lesson when working with the child.
Whole Class Feedback sheets are used to track the pupils who require more support in the later sessions.

Marking and moving on comments
Marking and moving on comments in books – time given for children to respond (*Adults use a coloured pen, children respond in purple*).

Mini- Quizes
Adults will use mini-quizes at the end of a lesson or in a mini-plenary. These will be verbal or physically moving such as 'true or false' or 'point to the answer'

Key Performance Indicators
The staff will use the KPIs to ensure that the key Sticky

Assessment Question 3. What can the pupils apply?

End Unit Assessment
At the end of the unit, the pupils will be set a task to apply their knowledge from the unit in a task or test in line with the theme of the topic. The task will allow them to show the key knowledge which the children can apply. Staff will use the Key Performance Indicators (*KPI*) to assess the task and to The KPIs will be used to inform planning and future learning. When using the assessment from the scheme, it will also give an overview of the pupils achievement.

End of Year Expectations in Computing show pupils can

Assessment Question 3. What can the pupils apply?

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