COMPUTING LONG TERM PLANNING DOCUMENT

Computing is one subject where there is a scheme in place. For computing, the scheme of work is through teaching computing https://teachcomputing.org

Curriculum Intent Statement

The 2014 National Curriculum introduced a new subject, Computing, which replaced ICT. This represents continuity and change, challenge and opportunity. It gives schools the chance to review and enhance current approaches in order to provide an even more exciting and rigorous curriculum that addresses the challenges and opportunities offered by the technologically rich world in which we live.

Computing is concerned with how computers and computer systems work, and how they are designed and programmed. Pupils studying computing will gain an understanding of computational systems of all kinds, whether or not they include computers. Computational thinking provides insights into many areas of the curriculum, and influences work at the cutting edge of a wide range of disciplines.

The Acceptable Use of ICT Policy and the E-Safety Policies should also be read in conjunction with this policy.

The new National Curriculum presents the subject as one lens through which pupils can understand the world. There is a focus on computational thinking and creativity, as well as opportunities for creative work in programming and digital media. The introduction makes clear the three aspects of the computing curriculum: computer science (CS), information technology (IT) and digital literacy (DL).

The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate, able to use, and express themselves and develop their ideas through, information and communication technology at a level suitable for the future workplace and as active participants in a digital world.

Aims and Objectives

Through teaching Computing we equip children to participate in a rapidly changing world where work and leisure activities are increasingly transformed by technology. We enable them to find, explore, analyse and exchange and present information. We also focus on developing the skills necessary for children to be able to use information in a critical and effective way. Computing skills are a major factor in enabling children to be confident, creative and independent learners.

Our Aims Are:

- To provide all pupils and staff with opportunities to develop their computing capabilities.
- To allow pupils and staff to gain confidence and enjoyment from their computing activities and to develop skills which extend and enhance their learning throughout the curriculum.
- To develop pupils awareness of the use of computers not only in the classroom but in everyday life.
- To allow pupils to evaluate the potential of computers and also their limitations e.g. to learn about issues of security, confidentiality and accuracy.
- To develop logical thinking and problem solving.
- To provide opportunities for pupils to gain knowledge of a variety of computing tools and equipment.
- To encourage pupils to become autonomous, independent, users of computing both as a learning resource and as a discipline in its own right.
- To develop a whole school approach to computing ensuring continuity and progression.

LONG TERM PLAN

Cycle B - KS1

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Data and information	Data and information	Programming A	Programming A	Programming B	Programming B
Grouping data	Pictograms	Moving a robot	Robot algorithms	Introduction to animation	Introduction to quizzes

Cycle A - KS1

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Computer systems and networks	Computer systems and networks	Creating media	Creating media	Creating media	Creating media
Technology around us	IT around us	Digital painting	Digital writing	Digital photography	Making music

Cycle A – LKS2

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Data and information	Data and information	Programming A	Programming A	Programming B	Programming B
Branching databases	Data logging	Sequence in music	Repetition in shapes	Events and actions	Repetition in music

Cycle B – LKS2

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Computer systems and networks	Computer systems and networks	Creating media	Creating media	Creating media	Creating media
Connecting computers	The internet	Animation	Desktop publishing	Audio editing	Photo editing

Cycle A – UKS2

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Data and information	Data and information	Programming A	Programming A	Programming B	Programming B
Flat file databases	Spreadsheets	Selection in physical computing	Variables in games	Selection in quizzes	Sensing

Cycle B – UKS2

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Computer systems and networks	Computer systems and networks	Creating media	Creating media	Creating media	Creating media
Sharing information	Internet communication	Video editing	Vector drawing	Web page creation	3D modelling

Key Skill for Year 1 and 2

Key Skill	Coverage Year 1/2 Cycle A	Coverage Year 1/2 Cycle B
1. Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions	Autumn Spring	Autumn Spring
2. Create and debug simple programs	Autumn Spring	Autumn Spring
3. Use logical reasoning to predict the behaviour of simple programs	Autumn Spring	Autumn Spring
4. Use technology purposefully to create, organise, store, manipulate and retrieve digital content	Autumn Summer	 Spring Summer
5. Recognise common uses of information technology beyond school	Autumn Spring Summer	Autumn Spring Summer
6. 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.	Autumn Spring Summer	Autumn Spring Summer

Key Skills for Year 3, 4 , 5 and 6

Key Skill	Coverage Year 3/4 Cycle A	Coverage Year 3/4 Cycle B	Coverage Year 5/6 Cycle A	Coverage Year 5/6 Cycle B
1. design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	Summer Spring	Summer	Summer	Summer
2. use sequence, selection, and repetition in programs; work with variables and various forms of input and output	Summer Spring	Spring Summer	Summer	Summer
3. use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	Summer Spring	Autumn Spring Summer	Summer	Summer

4. 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	Autumn	Autumn Spring Summer	Autumn Spring	Autumn Spring
5. use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	Autumn Summer	Autumn	Autumn Spring	Autumn Spring
6. 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	Autumn Spring Summer	Autumn Spring Summer	Autumn Spring	Autumn Spring
7. use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Autumn Spring Summer	Autumn B Spring Summer	Autumn	Autumn Spring

KNOWLEDGE AND SKILLS LADDER	EYFS	Years 1 and 2	Years 3 and 4	Years 5 and 6
Multimedia and word processing NC KS1 -use technology purposefully to create, organise, store, manipulate and retrieve digital content - recognise common uses of information technology beyond school) NC KS2 -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)	Develop early mouse and keyboard skills (familiarity with letters, numbers, backspace, arrow keys and spacebar) Use touch-screen technologies - interactive whiteboards and tablets. Explore changing text style, size and colour (using an appropriate simple software) Explore a teacher-selected website. Print out work using appropriate software Recognise common uses of information technology beyond school (traffic lights, tills, printer etc.)	Develop accurate mouse skills and familiarity with the keyboard – spacebar, backspace, shift, enter, insert words and sentences) Add text to photographs, graphics (images) and sound e.g. captions, labelling and simple sentences through the use of e.g. *2create A Story* Use pre-defined layouts or templates for different purposes Begin to word process short narrative and non-narrative texts (Yr 2) Save, print, retrieve and amend their work (Yr 2) Develop basic editing skills including different presentational features (font size, colour and style) Begin to explain reasons why choices have been made to teacher or talk partner (Yr 2 - how it may enhance or change the mood and atmosphere of their presentation and make changes where appropriate)	Evaluate a range of printed and electronic texts, appropriate to task e.g newspaper, poster, webpage Select and import graphics from digital cameras, graphics packages and the Internet Select suitable sounds (including recording with a microphone) and visual effects Through peer assessment and self-evaluation, evaluate design and make suitable improvements Recognise the difference and the advantages and disadvantages between electronic media and printed media and select key features when designing publications With support, plan structure and layout of document/ presentation Organise and present information for a specific audience (e.g. use font sizes and effects appropriately to fit purpose of text) Recognise key features of layout and design such as text boxes, columns, borders, WordArt Develop further basic drafting and editing skills Cut, copy and paste between applications (use keyboard short cuts) Use spell checker Delete, insert and replace text using mouse or arrow keys Begin to use more than two fingers to enter text (touch typing skills) Through peer assessment and self-evaluation, evaluate work both during and after completion, and make suitable improvements	Evaluate a range of electronic multimedia, and understand the implications appropriate to their given task e.g. key features of layout and design Plan structure and layout of presentation for a specific audience Evaluate and select suitable information and media from a range of electronic resources Create a range of hyperlinks to produce a non-linear presentation (links within a PowerPoint presentation) Choose appropriate techniques to create an effective and well polished presentation considering intended audience. **When word processing children should:** • format text to indicate relative importance. • justify text where appropriate. • cut and paste between applications. • delete/insert and replace text to improve clarity and mood. • make corrections using a range of tools (eg spell check, find and replace) • develop confidence using both hands when typing (touch typing)

Graphics, Music and Sound	Use paint programs for mark making Change tools such as brush size and colour Fill sections using fill tool Use a stamp tool Use a paint program to communicate their ideas Make and listen to and change sounds using simple programs and devices • Use buttons to play sounds • Record sounds and speech • Choose pre-recorded sounds in a piece of software	With support, Select appropriate images and add pictures they have created/ from the internet Use a paint package to create a picture to communicate their ideas • Explore shape, line and colour to communicate a specific idea • Talk about their use of a paint package and their choice of tools Talk about the differences (and advantages and disadvantages of) between a graphics package and paper based art activities (undo, changes quickly and easily made) To animate an image (eg using 2Simple) To print To save with help Begin to select, control or record a sound to add to my work (use stop, record and playback functions) e.g. Talk Pods, tape recorder, MP3 recorder, microphone and 2create a story Talk about their music when they share their recordings with the rest of the class	Build up images by selecting, copying and pasting within the image Explore and begin to use the more advanced features in the paint package, e.g. colour picker, colour replacer (if available) Use a range of visual effects such as filters, hues and painting over photographs. Save images and use them as part of other multimedia and desktop publishing work Use ICT to select and record sounds in multimedia software Use music software to organise and reorganise sounds Locate, record, save and retrieve sounds Listen to a variety of radio programmes, evaluating their style Add sounds from different sources.	Select, copy and paste within and between photographs Explore "airbrush" techniques to improve photographs, such as used in magazines with celebrities Record sounds using sound editing software Collect sounds from a variety of sources (online, digital sound recorder) Import sounds into sound editing software (extend to layer and edit sounds)
Digital Imagery	Explore using digital cameras and audio recorders to capture information (using buttons such as play, stop and pause) Examine objects using a visualiser or microscope	Use a digital still or video camera to take a picture or record their work Talk about the images or film they have taken and the tools used Label an image they have created Begin to discuss the quality of their image and make decisions (e.g delete a blurred / bad image) Begin to change or enhance photographs and pictures (crop, re-colour) Create a sequence of still images which together form a short animated sequence Upload their images on the learning platform	To use still and video cameras, independently To take photographs with a digital microscope To evaluate quality of footage taken To understand the need to frame shots and keep the camera still To download still images and video To sequence still images and video and use simple editing techniques to create a presentation Create a simple animation either by using stop-motion techniques with a webcam, or by using animation software Evaluate and improve work with a view to audience and purpose	Plan a video or animation by drawing a storyboard To use different filming techniques and camera angles e.g. zoom, panning, wide shot etc to create different mood/perspective Use a range of sound effects, music and voice-overs to create mood/ atmosphere Select and edit sounds, text, movie clips and other effects to suit purpose and audience Evaluate and improve work with a view to purpose and audience

Communication and Collaboration (Digital Literacy) (NC KS2 -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)	Be able to use simple login details with support to access our network and subscription software. Use different forms of electronic communication in free play e.g. walkie talkies, phones, sound recording devices, (with support email) Use a range of software to enhance learning in all areas.	Look at the different ways that messages can be sent, forums, letters, telephone, email, Stickies, text, instant messaging, walkie talkies Contribute ideas to a class email or respond to a message or forum on the learning platform Use login details with support to access our network and subscription software. Contribute ideas to a class blog, forum or web page Compare all the different ways of using electronic communications can be sent and start to consider their advantages and disadvantages Consider who can see their contributions on the learning platform	Begin to experience other forms of online discussion, such as blogs, wikis, quizzes, surveys and video conferencing **Begin** to personalise your own Learning Platform page, adding a photo and favourite web links (SeeSaw) Access a shared space to follow web links and read instructions for work upload work to a shared space (Student Share) Select from your best work to save and share through an e-portfolio Select from your best work to save and share through an e-portfolio To start to think about the different styles of language layout and format of online communications sent to different people (eg. when it is appropriate to use "text language").	Initiate and take part in collaborative learning using at least two of o email o discussions o quizzes o surveys o blogs o wikis o web quests o video conferencing o shared online folders o other
Handling Data	Collect information by taking photographs Begin to sort, classify, group or sequence objects on screen Produce simple pictograms with help and answer simple questions based on pictograms	Use ICT to sort objects into groups according to a given criterion (e.g. yes/ no questions) Understand that ICT can create and modify charts quickly and easily Talk about how ICT helps them to organise their information Use a pictogram/ graphs to create/ represent simple data and help answer questions Understand the difference between questions and answers - Ask questions that comply with the rule that it can only have a yes or no answer	To choose, print and annotate appropriate graphs, to answer simple questions e.g. bar charts, or pie charts and interpret data Collect information by designing and using a simple questionnaire to record numbers, text and choices. As a class, design what information needs to go on record cards Create record cards to store collected information Use a database to generate bar charts and graphs to answer questions (Purple Mash) Answer questions by searching and sorting the database To compare how different graphs can be used for different purposes Explore some real-life examples of branching databases, such as keys for animal identification	Use graphs to provide supporting evidence for their conclusions **D**esign questions using key words, to search a large pre-prepared database Search using and/or (complex searches) Search using greater and less than To collect data in an efficient and accurate way To organise data by designing fields and records in a database To identify a problem which can be solved by collecting data Present results of database research for a specific audience To justify reasons for their choices and explain why other methods were not appropriate

| Research

(NC KS2
-use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content) | Explore a teacher-selected website.
Use hyperlinks and navigation buttons
Use a shortcut e.g. an icon on the desktop to navigate to a specific programme. | Talk about their use of ICT and other methods to find information

Talk about how ICT can give access quickly to a wide variety of resources

Use web based resources to find answers to questions (Enter text into a search engine to find specific given web sites)

Use hyperlinks and navigation buttons e.g. Select a specific part of the CBeebies site to find an activity
Access different types of information from different sources e.g. using CD players, web sites, TV, video, DVD etc.

Recognise that not all information is useful some information is more useful (Yr 2)

Begin to manipulate information using copy and paste for a specific purpose (Yr 2)

Understand that web sites have a specific address e.g. www.bbc.co.uk/ | Develop key questions to search for specific information to answer a problem

Identify key words to narrow searches

Begin to understand how a search engine locates information and that information is not always suitable

Use a range of techniques to navigate a given site

Use given information to answer specific questions, and evaluate how appropriate a site is
Understand the term 'copyright'.

Access suitable sites selected by the teacher by following links; share suitable sites with others in the class
Use information found online to inform presentation work, without copying and pasting text | Search the internet for specific information

Skim read and sift information

Check information for accuracy
Identify irrelevant, biased, implausible and inappropriate information

Present findings to a specific audience

Use a range of search engines and select the most appropriate

Use information found online to inform presentation work, without copying and pasting text
Save and use pictures, text and sound and video, and be able to import into a document for presentation |
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| Modelling and Simulation | Explore simple simulations and find out what happens if…

Use software to represent real life situations/environments

Compare real life and virtual situations | Using an art package or drag and drop software to create a representation of a real or a fantasy situation

Add backgrounds stamps/motifs or clip art to a scene

Explore a simulation to support a given topic and talk about what happens and why

Explore the effects of changing the variables in simulations and use them to make and test predictions e.g. BBC science clips or using an art package
Discuss their use of simulations and compare with reality | Enter data into a computer simulation to explore the effect of changing the variables in simulations and use them to make and test predictions (Coding)

Enter data into a spreadsheet

Change data and observe changes in results

Use results to solve problems | To identify and enter the correct formulae into cells, modify the data, make predictions of changes and check them

To change variables in a spreadsheet to solve problems

To make predictions and changes and check results.

To enter formulae for the four operations (+-x/) into a spreadsheet

To use 'SUM' to calculate the total of a set of numbers in a range of cells

To change data in a spreadsheet to answer 'what if…?' questions and check predictions

To use a spreadsheet to draw a graphs and answer questions

Using a simple layout demonstrated by the teacher, create a simple spreadsheet model and use it to solve problems |

Control and Monitoring (NC KS1 - 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) (NC KS2 - 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)	Explore toys that simulate control devices with the intention of finding out how they work e.g. traffic light, till, microwave, scanner Operate simple programmable devices (using basic directional language) e.g. Bee-Bots. Control simple games on screen using the arrow keys	Talk about how everyday devices can be controlled Explore a range of control toys and devices Create and follow instructions to move a around a course (physical and virtual). Create a sequence of instructions to control a programmable robot to carry out a pre-determined route to include direction, distance and turn (on screen or floor robot) On a computer predict what will happen once the next command is entered. Explore outcomes when individual buttons are pressed on a robot e.g. Bee-Bots. Have experiences of controlling other devices such as sound recording devices, music players, video recording equipment and digital cameras	As part of a class investigation, experience the use of a data logger attached to an interactive whiteboard Interpret the graph created by the data logger and make predictions Coding Year 3: To begin to design and write commands that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller To write a list of commands to produce a pre-drawn shape To use 'pen down' and 'pen up' to move a sprite To use the repeat key to produce shapes more efficiently Coding Year 4: To use the repeat command To use and change a pre-written procedure Write a procedure that uses other procedures to produce a result Write and record a procedure to produce simple shapes Build a procedure (e.g. hexagon) and name it. Write a procedure calling other smaller procedures (e.g. produce a flower by repeatedly drawing a hexagon and turning 20 degrees)	Plan an investigation using data logging technology Interpret results, draw conclusions and analyse the effectiveness of the technology Capture data readings over time Spot trends from readings Coding: • Use move commands to move sprites • Use rotate commands to rotate sprites • Use several blocks to build a simple script • Use wait command in scripts • Edit scripts and change the way the sprites moves • Use a keyboard to control movements of sprites • Alter the size of sprites • Produce a script that uses sounds • Create scripts that are activated when a sprite is clicked. • Copy scipts • Edit scripts to make desired changes • Combine sprites, backgrounds, sounds and movements • Use coordinates in 4 quadrants to identify position of sprites • Use sensors to control actions/sounds • Write a procedure to fit a scenario where sensors will be used • Create scripts to move sprites a set of predetermined movements Create own simple interactive game/activities
E-safety (NC KS1 -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.)	Begin to understand that all kinds of ICT tools are used for different modes of communication. Using age appropriate websites and stories to develop an understanding of online safety.	Discuss keeping personal information and keeping it private. Talk about who can see pages on the learning platform and see their work at home (out of school) Begin to understand they have to abide by school rules on Internet safety e.g. only navigate to given pages Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	To understand the schools e-safety policy: appropriate to their age – 'KS2 Think then click' Understand that comments made online that are hurtful or offensive are the same as bullying. Understand passwords are used to log in to access some web content and why these should be kept private To have an awareness of copyright of images age appropriate and relevant to their use	Develop and understand rules for personal internet safety To understand and abide by the schools e-safety policy: appropriate to their age – 'KS2 Think then click' Understand passwords are used to log in to access some web content and why these should be kept private To have an awareness of copyright of images age appropriate and relevant to their use

(NC KS2 -use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.)			To understand that electronic messages have to be sent to a specific electronics address/recipient To understand the different methods of communication e.g. blogging, instant messaging, forums, twitter and when these could be used	