High View Primary Learning Centre

Computing Curriculum

Intent

Computing High View Primary Learning Centre intends to develop 'thinkers of the future' through a modern, ambitious and relevant education in computing. We want to equip pupils to use computational thinking and creativity that will enable them to become active participants in the digital world. It is important to us that the children understand how to use the ever-changing technology to express themselves, as tools for learning and as a means to drive their generation forward into the future. Whilst ensuring they understand the advantages and disadvantages associated with online experiences, we want children to develop as respectful, responsible and confident users of technology, aware of measures that can be taken to keep themselves and others safe online. Our aim is to provide a computing curriculum that is designed to balance acquiring a broad and deep knowledge alongside opportunities to apply skills in various digital contexts. Beyond teaching computing discreetly, we will give pupils the opportunity to apply and develop what they have learnt across wider learning in the curriculum.

Implementation

Our scheme of work for Computing is delivered on through the use of NCCE Curriculum and covers all aspects of the National Curriculum. This scheme was chosen as it has been created by subject experts and based on the latest pedagogical research. It provides an innovative progression framework where computing content (concepts, knowledge, skills and objectives) has been organised into interconnected networks called learning graphs. The curriculum aims to equip young people with the knowledge, skills and understanding they need to thrive in the digital world of today and the future. The curriculum can be broken down into 3 strands: computer science, information technology and digital literacy, with the aims of the curriculum reflecting this distinction.

The national curriculum for computing aims to ensure all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation (Computer science)

- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems (Computer science)

- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems (Information technology)

- are responsible, competent, confident and creative users of information and communication technology. (Digital literacy)

Digital Literacy **is the ability and skill to find, evaluate, utilise, share, and create content using information technologies and the Internet**

Computer science **is the study of computers and computational systems.**

Information technology **is the study or use of systems (especially computers and telecommunications) for storing, retrieving, and sending information.**

Overview of Topics							
	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Autumn	Understanding the world - continuous provision	Computing Systems & Networks - Technology around us. **Autumn 2**	Computing Systems & Networks - IT around **Autumn 2**	Computing Systems & Networks - Connecting Computers. **Autumn 1**	Computing Systems & Networks - The Internet **Autumn 1**	Computing Systems & Networks - Systems and searching **Autumn 1**	Programming A - Variables in games. **Autumn 1**
Spring		Programming A - Moving a Robot. **Spring 2**	Programming **Spring 2**	Data & Information - Branching databases **Spring 1**	Creating Media - audio production **Spring 1**	Data & Information - Flat file databases **Spring 2**	Data & Information - Introduction to spreadsheets. **Spring 2**
Summer		Creating Media (digital writing **Summer 2**	Data & Information - Pictograms **Summer 2**	Programming B - Events and actions in programs **Summer 1**	Programming B - Repetition in games. **Summer 1**	Programming B - Selection in quizzes. **Summer 2**	Computing Systems & Networks - Communication and collaboration. **Summer 2**

Progression of knowledge breakdown of 3 pillars of computing

Information Technology

Foundation Stage	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Understanding the World	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.		use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.			
		recognise common uses of information technology beyond school		understand computer networks including the internet; how they can provide multiple services, such as the world wide web.	use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	understand computer networks including the opportunities they offer for communication and collaboration
Understanding the World Knows how to operate simple age-appropriate technology Knows that technology is used at home and school Use technology toys in role-play Use technology to record my play and learning. To develop an understanding of how to use online technology in a respectful way To know that information can be retrieved from computers To select and use technology for particular purposes	**Technology around us** To know how to identify technology that comes in different forms- computers, mobile phones, cars, bikes. To know how to identify a computer and its main parts – screen, mouse, tower, keyboard. To know how to use a mouse in different ways – click and drag, left button to select and twice quickly to open files and programs. Right click to give us options. Holding the left button down allows us to drag things. To know how to use a keyboard to type To know how to use the keyboard to edit text To know how to create rules for using technology responsibly.	**Information technology around us** To know how to recognise the uses and features of information – What information technology means. Features of information provide details and provide a use. To know how to identify information technology in the home – Internet, games consoles, cooking appliances. To know how to identify technology beyond school. This would include traffic lights, tills and scanners within summer markets, use of communication i.e email. To know how to explain how information technology benefits us. To make things quick and easier i.e with self scanners in the supermarket. Help us stay safe – traffic lights. Communicate – emails, texts and social media apps. To know how to show how to use information technology safely. The key rules to focus on are: -Ensuring games and apps are age appropriate. -Always sit when using a device to ensure it isn't broken.	**Connecting computers** To know how to explain how digital devices function – to know that they have an input, process and output. To know how to identify input and output devices – Input is something that sends a message to a device. Output is something that is sent out by the device To know how to recognise how digital devices can change the way we work – allowing us to send and share information quickly and easily. To know how to explain how a computer network can be used to share information – using the internet and data. To know how to explore how digital devices can be connected – through fixed cables, data, wifi or and internal intranet. To recognise the physical components of a network – network , switch, server, wireless bn access point.	**The Internet** To know how to describe how networks physically connect to other networks – using a router which connects all different devices together. To know how to recognise how networked devices make up the internet - the internet is a network of networks that are all connected together. To know how to outline how websites can be shared via the World Wide Web – found using a web address to lead to web pages which then shares further information. To know how to describe how the content of the WWW is created by people – the information is called content. It belongs to people or companies. To know how to evaluate the consequences of unreliable content – expressing that this maybe due to people misunderstanding or lying.	**Sharing information** To know how to explain that computers can be connected together to form systems To know how to recognise the role of computer systems in our lives – house hold appliances, entertainment and safety. To know how to recognise how information is transferred over the internet through the use of IP addresses, protcols and packets. All of which contain information. To know how to explain how sharing information online lets people in different places work together To know how to contribute to a shared project online knowing this is called collaboration. How working as a team is important and taking responsibilities of different roles. To know how to evaluate different ways of working together online- the use of the internet to complete this and how. Using a chat function to share information in real time. Cloud spaces to store and share information with easy access.	**Communication** To know how to identify how to use a search engine – that this is a webpage where key words will be typed into the search bar. To know how to describe how search engines, select results – to know this uses a program which is called crawler. This uses the key words that have been typed into the search bar. To know how to explain how search results are ranked – results are ranked by using algorithms which then gives a score to each page. This is all linked to the key words and specifics typed into the search bar. To know how to recognise why the order of results is important, and to whom – the order is important to ensure key information is shared with a wide range of people. It is important to users for them to gain information quickly and webpage designers to ensure returns of users. To know how to recognise how we communicate using technology – completed through public and private

			-Don't use devices at social times. i.e meal times. -stick to technology at agreed times. To know how to recognise the choices are made when using information technology. Choosing what is interacted with ie websites and apps. That can be used for good but also can have negative effects if choices or negative.				communication ie with all or some people. One way communication where information is just given (youtube) or two way (zoom and skype). To know how to evaluate different methods of online communication – this needs to be done based on what you are needing to communicate and why, how safe you can communicate this information and how private the information can be shared i.e encrypted or secure emails.
	On, off, technology. Press, lift, push, pull, mouse, screen, keyboard, camera, QR codes	Technology, Man-made, digital, screen, mouse, keyboard, program, click/drag, cursor	Information Technology, computer, device, barcode, scanner, communication, entertainment, appliances, signal, e-safety	Digital device, Input, process, output, connection, network, network switch, server, WAP, E-safety	Network, internet, world wide web, Router, Security, website, webpage, browser, domain, reliable	System, Input, process, output, protocol, ipput address, packet, reuse, explore, collaboration	Internet, world wide web, search engine, browser, keyword, google, Tim Berners-Lee, Ranking, crawlers, Algorithm

NC		use technology purposefully to create, organise, store, manipulate and retrieve digital		use technology safely, respectfully and responsibly. To be responsible, competent, confident and creative users of information and communication technology. To understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation			
Digital Literacy	**Understanding the world.** Safely use and explore a variety of materials, tools and techniques experimenting with function	**Digital Writing** To use a computer to write, using a keyboard and exploring where hands should be placed on the keyboard. To add and remove text on a computer- using the delete and cursor tools. To identify that the look of text can be changed on a computer – this text increase and decrease in size button, colour, font type. To make careful choices when changing text- taking into account how easy it is to read in relation to size and font type. To explain why I used the tools that I chose – what improvements did it make. To compare writing on a computer with writing on paper. How it looks different and why.	**Pictograms** To know how to recognise that we can count and compare objects using tally charts. To know how to recognise that objects can be represented as pictures To know how to create a pictograms, using the correct symbols. To know how to select objects by attribute and make comparisons To know how to recognise that people can be described by attributes and what this means. To know how to explain that we can present information using a computer and that this can be presented in different ways.	**Branching databases** know how to To know how to identify the object attributes needed to collect relevant data. Knowing what is in similar and what is different. To know how to create a branching database To know how to identify objects using a branching database To know how to explain why it is helpful for a database to be well structured. To know that for it to be effective the questions being asked will help separate the different data based on their attributes. To know how to compare the information shown in a pictogram with a branching database.	**Audio editing** To identify that sound can be digitally recorded – what these means in terms of being recorded onto a device. To use a digital device to record sound – what is the device smartphone, tablet or computer. To explain that a digital recording is stored as a file. That a file means an area that store specific information. To explain that audio can be changed through editing. Editing can make it sound better, worse or different to the original. To show that different types of audio can be combined and played together also known as mixing. To evaluate editing choices made, giving reasons why it was changed.	**Flat- file database** To know how to use a form to record information To know how to compare paper and computer-based databases To know how to outline how grouping and then sorting data allows us to answer questions. Related to categories i.e colour, age. This then filters out unrelated data to the question. To know how to explain that tools can be used to select specific data – search, filter and sort functions buttons or options on mouse menu. To know how to explain that computer programs can be used to compare data visually. To know this can be presented in graphs or charts to help find answers quickly and easily. To know how to apply my knowledge of a database to ask and answer real-world questions. Relating this to how they are used currently in different environments. Linking this to school registers.	**Spreadsheets** To know how to identify questions which can be answered using data To know how to explain that objects can be described using data To know how to explain that formula can be used to produce calculated data To know how to apply formulas to data, including duplicating. Developing a knowledge of the symbols which relate to mathematical operations. How it can help support calculate large amounts of data and create multiple copies of this using short cut keys. To know how to create a spreadsheet to plan an event. Using it to compare resources and costings to explore expenditure. To know how to choose suitable ways to present data to allow ease of reading and presentation.

	On, off, technology. Press, lift, push, pull, mouse, screen, keyboard, camera, QR codes	Text, word processor, font, keyboard, text cursor, enter, spacebar, toolbar, font, icon	Information, data, pictogram, group, tally, tally chart, program, properties, present, proble	Information, data, attributes, group, branching, database, multiple, classify, structure, present	Audio, input, output, microphone, speaker, podcast, waveform, jingle, track, presenter.	Information, data, collection, database, search, sort, filter, software, fields, records	Information, data, spreadsheet, format, formula, accounting, filter, software, tax, business
Computer Science	Foundation Stage	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Understanding the world	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		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			
	Understanding the world To develop problem solving skills within a team	**Moving a robot** To explain what a given command will do. Knowing a command is the instruction they are asking the robot to complete. To act out a given word related to programming. Recognising forward, backwards, left and right to be able to relate this to when the robot moves. To combine forwards and backwards commands to make a sequence To plan a simple program To find more than one solution to a problem. Knowing that programming will only follow what has been inputted and this may require changing to overcome obstacles.	**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	**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. Knowing that the same format can not be used if the desired outcome is different. This will result in it requiring a change of input to get a different output. To develop my program by adding features. Knowing that a feature will allow the program to perform a different action. This will then change the process the program will follow. To identify and fix bugs in a program. Whilst understanding a bug is a problem within the program and how to overcome this.	**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. That an infinite loop will mean it continues until a human stops it compared to a count controlled loop that they will place a value into the program to complete X amount of times. 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. Knowing that input is required to end the loop. To design a project that includes repetition, using a thought process of the actions that can be used within this.	**Selection in games** To explain how selection is used in computer programs. Knowing that different conditions can create different outcomes based on the different actions and commands. To relate that a conditional statement connects a condition to an outcome To explain how selection directs the flow of a program. The selection of a command or an action then directs the outcome that will happen during the program. To design a program which uses selection To create a program which uses selection To evaluate my program, expressing what went well and	**Variables in games** To define a variable as something that is changeable To explain why a variable is used in a program, what its purpose is and why this is needed. To choose how to improve a game by using variables. Being able to explain why it requires improvement, and how does it make it better. To design a project that builds on a given example. Being able to use prior knowledge to recognise things can always be improved. To use my design to create a project based on a given brief to be able to work within given parameters to aid focus.

				To design and crate a maze-based challenge	To create a project that includes repetition of a certain action.	what is required to be improved.	To evaluate my project, recognising positives and areas for improvement.
	problem solve, overcome, explore,	Programmed, robot, algorithm, button, direction, forward, backward, left, right, route	Programming, scratch jr, sprite, quiz, command, block, debugging, sequence, algorithm, outcome	Programming, scratch, blocks, commands, code, events, motion, sequence, trialling, debugging.	Programming, scratch, blocks, commands, code, events, motion, sequence, trialling, debugging.	Programming, scratch, logical, commands, algorithm, condition, selection, sequence, trialling, debugging.	Programming, variable, scratch, events, code, LED, algorithm, motor, modify, debugging

Appendix

Cross-Curricular links with Computing

Y1 Cross Curricular	Digital Paining – Art	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
	Grouping Data – Maths	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
Y2 Cross Curricular	Digital Photography – Art	To use a digital device to take a photograph To make choices when taking 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 photos can be changed

	Making Music – Music	To say how music can make us feel – happy, sad, energetic. To identify that there are patterns in music – repeating notes or sounds. This could increase or decrease in pattern. To describe how music can be used in different ways – advertising, parties, radio. To show how music is made from a series of notes. These notes are individual and collectively put together to make a piece of music. To create music for a purpose – link this to the emotions it makes you feel. What is the music used for – advert, game. To review and refine our computer work..
Y3 Cross Curricular	Creating Media – Desktop Publishing – Literacy	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
Y4 Cross Curricular	Programming A- Repetition in shapes – Maths	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 task into small steps To create a program that uses count-controlled loops to produce a given outcome.
	Data Logging – Maths	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 recognise how a computer can help us analyse data To identify the data needed to answer questions To use data from sensors to answer questions
Y5 Cross Curricular	Vector Graphics – Art	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 apply what I have learned about vector drawings
Y6 Cross Curricular	Sensing Movement - DT	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 an 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