

Herne Junior School's Computing Curriculum Progression

Our high-quality computing curriculum is planned as a 4-year journey across the school and equips our pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which our 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, our pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that our pupils become digitally literate – that is, that they are 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.

By the end of key stage 2, our pupils will have been taught to apply and understand the matters, skills and processes specified in the relevant programme of study.

Pupils are taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

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	LKS2 Year 3 Year 4	UKS2 Year 5 Year 6
Programming	<ul style="list-style-type: none"> Solve open ended problems with a floor robot, screen turtle and other programmable devices. Design, write and run executable programs using a programming language e.g. that used for a floor robot, Scratch, Kodu, Espresso Coding. Be able to debug an algorithm (set of instructions) and correct any errors. Use repetition in programs to make them more efficient. E.g. Rpt4[FD5 RT90] to draw a square with Roamer. Be able to explore the effect of changing variables. Use them to make and test predictions. <p>Use 'selection' in a programming sequence i.e. use 'if... then... else...' type actions or statements e.g. if a character is touching a wall then bounce back, else move forward.</p>	<ul style="list-style-type: none"> Predict how a provided algorithm will behave before testing it (e.g. write a program or procedure in symbols and ask pupils to 'write the story' of the outcome before testing it.) Represent an algorithm symbolically (e.g. as a flow chart) to plan a procedure. Develop algorithms which include 'if' statements (e.g. if the temperature drops below...) and loops (e.g. repeat [an instruction] 4 times) Develop more complex flow diagrams and procedures that draw on others (e.g. program traffic lights either end of a narrow bridge so that cars don't collide) Refine procedures (algorithms) to improve efficiency and achieve desired outcomes. Create a program which includes a method of scoring (e.g. each time a sprite bumps into a particular object increase the score and each time it bumps into another object decrease the score). Create a program that requires a timer and set the variables as appropriate to the program (e.g. set a timer for a contestant to solve a maze within 30 seconds).

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| <ul style="list-style-type: none"> • Follow a simple search to find specific information from a web site or CD ROM. • Develop key questions and key words to search for specific information to answer a problem (e.g. a question such as where could we go on holiday? would become holiday destinations). • Save and retrieve accessed information through the use of Favourites, History, and Save As... • Use found information purposefully to complete specific tasks e.g. copy, paste and edit relevant information. • Understand the dynamics of search engines and know that there are different search engines - some within sites, and some for the whole of the Internet (e.g. Google). Use them appropriately. • Use search engines for different media (e.g. Google Image Search, video, www.findsounds.com). • Skim read and sift information to check its relevance and modify search strategies if necessary. • Be able to explain that the computers in the classroom are part of the school network. That they are connected by wires (or wirelessly) to a main computer called the server. Other devices such as printers, projectors and visualisers may also be connected. Draw or a label a diagram to show this. • Be able to explain that the server is connected to the Internet, which is made up of a global network and is able to communicate with other servers to share resources and data. Draw or a label a diagram to show this. • Access a given website by typing in the URL (Uniform Resource Locator) into the address bar of a browser and be able to explain what the different parts of the 'address' (URL) refer to. • Be able to explain what the school's monitoring software does and why it has been installed. | <ul style="list-style-type: none"> • Use a range of internet search technologies efficiently • Search using appropriate keywords and search syntax e.g. "Winston Churchill", python+monty, police-"rock band" • Use a range of search terms in different search engines to find the most appropriate results • Be able to critically evaluate search results and identify factors (algorithms) which affect ranking e.g. some search engines ignore common words, others use word order. • Be able to identify when search results are being influenced by commercialism, advertising or filtering • Check the results of any searches by referring to other sources whether digital or paper-based • Select an appropriate search engine to find information related to a topic. • Develop strategies for finding information (using different keywords, cross checking with other websites, referring to other sources such as books, people, etc). • Consider the effectiveness of search results and refine where necessary. • Discuss issues of copyright and downloading material e.g. mp3s, images, videos, etc. • Develop skills to question where web content might originate from and understand that this gives clues to its authenticity and reliability (by looking at web address, author, linked pages, etc.) • Skim and select information checking for bias and different viewpoints. • Check plausibility of information by using a variety of sources on the same topic. • Appropriately reference sources used in their work. • Copy, paste, save and use pictures, text and sound and be able to import into a document for a specific audience or task. • write some basic HTML to edit websites • write basic HTML to create a simple web page. Log on to an email account, open emails, create and send appropriate replies. • Create and send an email to a prearranged partner, selecting the recipient from a class address book. • Create own address book/add to an existing one. • Attach different files to emails. • Use and refine their skills while independently creating, sending and responding to emails, blogs and forums. (With appropriate supervision and due regard for e safety) |
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		<ul style="list-style-type: none"> Produce formal or informal messages appropriate to a task or to solve problems (requesting information, sharing data, etc.) Contribute to discussion forums, blogs and surveys. Create own discussions, blogs and surveys.
Word Processing	<ul style="list-style-type: none"> Use different font sizes, colour and effects to communicate meaning for a given audience. Use different keyboard shortcuts to make them more efficient. Use Cut, copy and paste to refine and reorder content. Recognise key features of layout and use design features such as text boxes, columns, borders, bullets and numbering Use layout, format, graphics and illustrations for different purposes or audiences. Insert and edit simple tables. Use page setup to select different page sizes and orientations. Use appropriate editing tools to ensure their work is clear and error free (using tools such as spell checker, thesaurus, find and replace). Select and import graphics and prepare for use (cropping, resizing, editing). Create a range of hyperlinks and produce a non-linear, interactive presentation. 	<ul style="list-style-type: none"> Develop their use of hyperlinks to produce more effective interactive, non-linear presentations. Make effective use of transitions and animations in presentations. Consider the effect on the audience and the appropriateness of such devices. Independently select and import images and video from digital cameras, graphics packages and other sources and prepare it for processing using ICT. Format and edit work to improve clarity and mood, use a range of tools e.g. cut and paste, justify, tabs, insert and replace. Make use of reviewing tools in word processors to collaborate in evaluating each other's work. <p>Through peer and self-evaluation, children evaluate their design, and make improvements.</p>

Data	<ul style="list-style-type: none"> • Generate and compare different charts and graphs (using graphing software, database or spreadsheet) and understand that different graphs are used for different purposes. • Create and use a branching database to organise and sort data to answer questions. • Determine the data needed to answer a specific question; organise, present, analyse and interpret the data in tables, diagrams, tally charts, pictograms and bar charts, using ICT where appropriate. • Begin to develop skills to identify clearly what data needs to be collected and design a questionnaire or use a input device (e.g. data logger) to aid its collection. • Use a spreadsheet to explore simple patterns (eg in a number square). • Enter labels and numbers into a spreadsheet. • Enter formulae into a spreadsheet and modify the data, (simple calculations + - × ÷). • Use 'SUM' to calculate the total of a set of numbers in a range of cells. • Identify and enter the correct formulae into cells, modify the data, make predictions of changes and test them. • Copy formulae to create tables of results. • Use a spreadsheet to draw a graph to help answer specific questions. 	<ul style="list-style-type: none"> • Design questions using key words, to search a large pre-prepared database. • Use complex searches (and/or, is greater/less than) to search data when looking for relationships and patterns in data. • Modify a search pattern in order to find specific information. • Check for accuracy by checking data, using different views, search tools, and graphing. Identify and correct inaccuracies. • Solve complex enquiries involving selecting, processing, and presenting data; drawing conclusions from the process (e.g. is there a relationship between mini-beast habitats and diets?). • Collect appropriate data, enter it into a database and use the database to answer simple questions and provide information. • Raise questions of the data and translate them into search criteria. • Construct, refine and interpret frequency tables; bar charts with grouped discrete data; line graphs; interpret pie charts. • Make predictions and changes and check results. • Change data and formulae in a spreadsheet to answer 'what if...?' questions and check predictions. • Use more advanced formulae (Sum, average, mode etc). • Use information from the analysis of data to present findings in another application.
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Digital Creativity	<ul style="list-style-type: none"> • Use ICT to select and record voice and sounds – (e.g. Dictaphone, digital voice recorder, Sound recorder in IWB software). • Use recorded sound files in other applications. • Locate and use sound files from Internet, CD ROM, learning platform and Multimedia software (e.g. IWB software). • Select, import and edit existing sound files in sound editing software (e.g. Audacity). • Use music software to experiment capturing, repeating and reordering sound patterns. • Use ICT to create and perform sounds or music that would otherwise not be possible live – e.g. playing a multi-part piece or a very fast piece. • Acquire, store and retrieve images from cameras, scanners and the internet and begin to use paint packages or photo-manipulation software to change an image (e.g. apply different effects) • Begin to independently capture, store, retrieve and edit a digital image. • Develop greater control over the digital stills video camera and use the enhanced tools (Macro, Landscape, Zoom). • Discuss and evaluate the quality of their own and others' captured images and make decisions (e.g. keep, delete, change). 	<ul style="list-style-type: none"> • Import music and stills into video editing software and add to film projects. • Add simple titles and credits • Plan and create a short animated sequence to communicate a specific idea, using a storyboard and timeline. • Make use of transitions and special effects in video editing software and understand the effect they have on the audience. • Export movies in a variety of formats and use them in multimedia presentations. • Create a short animated sequence from captured images in simple storyboarding software, to communicate a specific idea. • Create their own sounds and compositions to add to their presentations / films / images / photos. • Use ICT to perform sounds or music that would otherwise not be possible live (eg playing a multi-track or a very fast piece) • Use ICT to produce music for a specific purpose, considering the impact on the audience (eg length, style, genre etc.) • Combine stills, video and sound using a video editing package.
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