

Progression of Computing skills at Carlinghow Academy

COMPUTING IN THE EARLY YEARS

<p>Three and Four Year Olds</p>	<p><u>PSED</u></p> <ul style="list-style-type: none"> Remember rules without needing an adult to remind them. <p><u>Physical Development</u></p> <ul style="list-style-type: none"> Match their developing physical skills to tasks and activities in the setting. <p><u>Understanding the World</u></p> <ul style="list-style-type: none"> Explore how things work
<p>Reception</p>	<p><u>PSED</u></p> <ul style="list-style-type: none"> Show resilience and perseverance in the face of a challenge. Know and talk about the different factors that support their overall health and wellbeing: <ul style="list-style-type: none"> - sensible amounts of 'screen time'. <p><u>Physical Development</u></p> <ul style="list-style-type: none"> Develop their small motor skills so that they can use a range of tools competently, safely and confidently. <p><u>Expressive Arts and Design</u></p> <ul style="list-style-type: none"> Explore, use and refine a variety of artistic effects to express their ideas and feelings.
<p>ELG</p>	<p><u>PSED</u></p> <ul style="list-style-type: none"> Managing Self - Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. <p><u>Expressive Arts and Design</u></p> <ul style="list-style-type: none"> Creating with Materials - Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

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AIMS

The national curriculum for computing aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology.

At Carlinghow Academy we ensure the aims are met by teaching the following skills:

COMPUTER SCIENCE PROBLEM SOLVING AND PROGRAMMING	
Year 1	<ul style="list-style-type: none"> • Describe algorithms as sequences of instructions in everyday contexts. • Plan a sequence of steps to solve real-life problems. • Program floor robots using sequences of instructions (using directional language) to implement an algorithm. • Create programs for floor robots and sprites on the screen using a number of steps in order before pressing the Go button. • Begin to use conditional language like "if" and "when."
Year 2	<p>As above plus:</p> <ul style="list-style-type: none"> • Describe algorithms as sequences of instructions or sets of rules in everyday contexts; understand the importance of order and accuracy of these. • Program on screen using sequences of instructions to implement an algorithm. • Create programs as sequences of instructions when programming on screen, correcting any errors.

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	<ul style="list-style-type: none"> • Begin to experiment with variables
Year 3	<p>As above plus:</p> <ul style="list-style-type: none"> • Design and write a program using a block language (programs to include movement, dialogue, sound effects, stages, sprites, loops and variables) without user interactions. • Use sequence in programs. • Write a program to produce output on screen. • Explain how loops and random numbers are used in a program. • Explain how conditional statements are used in a program. • Understand what it means to decompose an algorithm and decompose a program into smaller parts.
Year 4	<p>As above plus:</p> <ul style="list-style-type: none"> • Design and write a program using a block language to a given brief, including simple interaction (programs to include variables, stages, artificial intelligence and a scoring system). • Use sequence and repetition in programs. • Write a program that accepts keyboard input and produces on-screen output. • Develop their own simulation of a simple physical system on screen.
Year 5	<p>As above plus:</p> <ul style="list-style-type: none"> • Design, write and debug a program using a block language based on their own ideas (programs to include multiple sprites, multiple variables, sensors and conditional statements). • Use sequence, selection and repetition in programs. • Write a program that accepts keyboard and mouse input and produces output on screen and through speakers. • Develop their own simple computer control application. • Plan a solution to a problem using decomposition.
Year 6	<p>As above plus:</p> <ul style="list-style-type: none"> • Design, write and debug a program using a second programming language based on their own ideas (using loops, sprites that move in a variety of ways, allowing them to disappear and appear randomly, manipulate variables and use operators that determine an outcome of a conditional statement). • Use sequence, selection, repetition and variables in programs.

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	<ul style="list-style-type: none"> • Write a program that accepts inputs other than keyboard and mouse and produces outputs other than screen or speakers. • Design, write and debug their own computer control application. Solve problems using decomposition, tackling each part separately. • Understand that coding is the use of programming languages to make games, programs and computers things. • Write and adapt programmes using Javascript and Python (print command, run button, input command, random command).
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COMPUTER SCIENCE LOGICAL REASONING	
Year 1	<ul style="list-style-type: none"> • Explain what they think a program will do.
Year 2	<p>As above plus:</p> <ul style="list-style-type: none"> • Give logical explanations of what a program will do under given circumstances, including some attempt at explaining why it does what it does.
Year 3	<p>As above plus:</p> <ul style="list-style-type: none"> • Use logical reasoning to predict outcomes and detect errors in programs. • Use and explain a simple, sequencebased algorithm in their own words.
Year 4	<p>As above plus:</p> <ul style="list-style-type: none"> • Use logical reasoning to detect and correct errors in programs. • Explain an algorithm using sequence and repetition in their own words.
Year 5	<p>As above plus:</p> <ul style="list-style-type: none"> • Explain a rule-based algorithm in their own words. • Use logical reasoning to detect errors in algorithms.
Year 6	<p>As above plus:</p> <ul style="list-style-type: none"> • Give clear and precise logical explanations of a number of algorithms. • Use logical reasoning to detect and correct errors in algorithms (and programs).

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COMPUTER SCIENCE NETWORKS AND SEARCH ENGINES	
Year 2	<ul style="list-style-type: none"> • Explain and understand how an email is sent.
Year 3	<p>As above plus:</p> <ul style="list-style-type: none"> • Understand that email and videoconferencing are made possible through the internet.
Year 4	<p>As above plus:</p> <ul style="list-style-type: none"> • Use and explain how search engines work. • Explain how the internet makes the web possible. • Understand that search engines rank pages according to relevance. • Create a webpage and explain how web pages are created and transmitted.
Year 5	<p>As above plus:</p> <ul style="list-style-type: none"> • Explain how search engines are ranked. • Understand how data routing works on the internet. • Explain how web pages are created and transmitted in their own words.
Year 6	<p>As above plus:</p> <ul style="list-style-type: none"> • Understand how mobile phone or other networks operate. • Understand how domain names are converted into IP addresses on the internet. • Appreciate that search engines rank pages based on the number and quality of in-bound links.

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INFORMATION TECHNOLOGY SEARCHING	
Year 3	<ul style="list-style-type: none"> • Search for information within a single site. • Describe how search engines select pages according to keywords found in the content.
Year 4	<p>As above plus:</p> <ul style="list-style-type: none"> • Use a standard search engine to find information using a range of strategies to be more successful in finding reliable information.
Year 5	<p>As above plus:</p> <ul style="list-style-type: none"> • Use filters to make more effective use of a standard search engine. • Understand that search engines use a cached copy of the crawled web to select and rank results
Year 6	<p>As above plus:</p> <ul style="list-style-type: none"> • Make use of a range of search engines appropriate to finding information that is required.

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DIGITAL LITERACY (INCLUDING E-SAFETY)	
Year 1	<ul style="list-style-type: none"> • Identify what personal information is. • Identify what to do if they see disturbing content online at home or at school. • Identify ways to keep themselves safe while using digital technology. • Understand that information on the internet can be seen by others. • Describe some of the risks that occur on the internet. • Show an awareness of how IT is used for communication beyond school.
Year 2	<p>As above plus:</p> <ul style="list-style-type: none"> • Explain what personal information is and develop awareness of why it is special and should not be shared. • Explain what to do if they have concerns about content or contact online. • Keep safe and show respect to others while using digital technology. • Identify ways they can use the Internet to communicate with family and friends. • Show an awareness of how IT is used for a range of purposes beyond school.
Year 3	<p>As above plus:</p> <ul style="list-style-type: none"> • Identify who they can trust and share their personal information with online. • Use digital technology safely and show respect for others when working online. • Identify how to report concerns and inappropriate behaviour in school. • Recognise unacceptable behaviour when using digital technology. • Decide whether a web page is relevant for a given purpose or question. • Use email and videoconferencing in class appropriately. • Explain and understand online protocols, in order to stay safe on the web. • To identify cyberbullying and its consequences. • Identify the risks on online gaming and know how to protect themselves.
Year 4	<p>As above plus:</p> <ul style="list-style-type: none"> • Demonstrate that they can act responsibly when using computers.

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	<ul style="list-style-type: none"> • Identify and explain the differences between acceptable and unacceptable behaviours when using digital technology. • Know who to talk to about concerns and inappropriate behaviour at home or in school. • Decide whether digital content is relevant for a given purpose or question. • Collaboratively communicate with peers on a shared wiki appropriately. • Begin to use a range of online communication tools, such as forums, email and polls in order to formulate, develop and exchange ideas. • Describe the meaning of copyright and the importance of acknowledging sources
Year 5	<p>As above plus:</p> <ul style="list-style-type: none"> • Demonstrate that they can act responsibly when using the internet. • Discuss the consequences of particular behaviours when using digital technology. • Know how to report concerns and inappropriate behaviour in a range of contexts. • Decide whether digital content is reliable and unbiased. • Work collaboratively with peers on a class website or blog. • Explain what is meant by copyright
Year 6	<p>As above plus:</p> <ul style="list-style-type: none"> • Show that they can think through the consequences of their actions when using digital technology. • Identify principles underpinning acceptable use of digital technologies. • Know a range of ways to report concerns and inappropriate behaviour in a variety of contexts. • Articulate an opinion about the effectiveness of digital content. • Use online tools to plan and carry out a collaborative project successfully.