The National Curriculum and the Centre for Computing History

Ways in which a visit to CCH supports the aims of specific NC subjects at the Key Stage 3

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Contents:

KS 3 : Computing

KS 3 references	**Supported by visit to CCH through:**
KS3 ● design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems ● understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem ● use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions ● understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal]	Workshops: coding and controlling devices Megaprocessor for Boolean logic, binary, adders

KS 3 : Science

KS 3 references	Supported by visit to CCH through:
KS 3 Light waves: the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface	(June 2017) Connected World display in main gallery Optic fibres a way to use light to communicate Main gallery exhibits Use of light as a means to store data: CDs, Laser Discs
KS 3 Current electricity: ● electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge ● potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current ● differences in resistance between conducting and insulating components (quantitative)	Workshops: controlling devices, using the Makey Makey Megaprocesor: driven by relatively small currents, usefulness of parallel connections, overall current consumption of complex circuits - processors, heat and the design of the ARM processor.
KS 3 Magnetism: ● magnetic poles, attraction and repulsion ● magnetic fields by plotting with compass, representation by field lines ● Earth's magnetism, compass and navigation ● the magnetic effect of a current, electromagnets, DC motors (principles only)	Main gallery exhibits Use of properties of magnetism to 'write' data onto tape and discs Core store - that used principles of magnetism to store a 1 or 0

KS 3 : Maths

KS 3 references	Supported by visit to CCH through:
KS 3 Solve problems: begin to model situations mathematically and express the results using a range of formal mathematical representations	Workshops: Expressing mathematical models using a programming language
KS 3 Number: use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals	Workshops: Expressing mathematical models using a programming language
KS 3 Number ● round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures] ● use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a<x\leq b$	Workshops: Potential for error when representing decimal values in binary
KS 3 Number use a calculator and other technologies to calculate results accurately and then interpret them appropriately	Workshops: Accuracy and interpretation of computer generated results

KS 3 Algebra ● understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors ● model situations or procedures by translating them into algebraic expressions or formulae and by using graphs	Workshops: Use of algebra within programming environment to obtain results

KS 3 DT

KS 3 references	**Supported by visit to CCH through:**
KS 3 Evaluate: ● analyse the work of past and present professionals and others to develop and broaden their understanding ● investigate new and emerging technologies ● understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists	Main gallery: Presented with the development of personal computing
KS 3 Technical knowledge: ● understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs] ● apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors] and control outputs [for example, actuators] using programmable components [for example, microcontrollers]	Main gallery: Workshops: MicroBit Megaprocessor: embedded processors

KS 3 History

KS 3 references	Supported by visit to CCH through:
KS 3 challenges for Britain, Europe and the wider world 1901 to the present day social, cultural and technological change in post-war British society	Main gallery: History of computing