

Brompton and Sawdon CP Whole School Computing Curriculum

Rationale

- It is our duty at Brompton & Sawdon CP, as a mainstream school, to provide a curriculum that is **ambitious** and **challenging** for **all** learners (where practical).
- This curriculum must fulfil the requirements set out in the **National Curriculum**. However, at Brompton, we go **beyond** these expectations, delivering a **deep**, as well as a **broad and balanced**, curriculum, which also reflect the needs, **rural context** and interests of our pupils.
- Whilst it is important that students have the opportunity to experience this depth of learning and experience their year group's curriculum and expectations, this should not be at the expense of **mastery** and **long-term retention**.
- When a student has not mastered a year group's curriculum, it is important that leaders and teachers **adapt** their curriculum, resources and practice. This may require teachers to 'secure' previous year group's expectations.
- At Brompton & Sawdon CP we firmly believe that **mixed-aged classes** are a benefit and not a necessity or hindrance; they allow students to progress at their own rate, whether that is allowing students to build on their strengths and looking at the next years' curricula or allowing students the time and support to secure understanding of previous year groups' curricula.
- We recognise, at Brompton, that students' **starting points** and previous educational experiences vary significantly. Our curriculum allows all students, especially the **disadvantaged**, to achieve their potential.

The following whole-school Computing curriculum reflects the above rationale. It also sets out how Brompton & Sawdon CP plan for and deliver **(and go beyond)** the National Curriculum. This is a 'working document'; teachers and leaders adapt the following based on the 'impact' on students.

This plan outlines what is taught (Intent), as well as when, where, why, how it is taught (Implementation). It breaks down the school's Art and Design curriculum into each dimension of the subject and then by year group. This allows teachers to clearly see the progression and sequence that skills need to be taught, so they can adapt their practice (if required).

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KS1 Computing

<p style="text-align: center;">Intent - What is taught? (Objectives) Beyond?</p>	<p style="text-align: center;">Implementation – When, How, Where and Why?</p>
<p><u>Year 1 and 2 Students will:</u></p> <ul style="list-style-type: none"> • 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 • use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school <p>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</p>	<p><u>Class 1 – Year 1</u></p> <p>Computing is woven throughout our entire curriculum and children in Year 1 are exposed to technology multiple times throughout the school day.</p> <p>Use technology purposefully - Continuing on from EYFS, children are taught in short, stand-alone lessons how to use the basic functions of technology we have available throughout the school. Children have access to a class computer which allows them to become familiar with the simple processes of turning on, logging on, selecting a program and interacting with this program using a mouse and keyboard. Children use a range of 2simple software, including Simple City to manipulate, create and store content. For example - the children will create their own zoo scene that can be saved onto the desktop.</p> <p>Children also have access to an iPad which allows them to engage with apps through touch-screen, clearing of cache data and taking screenshots of information they would like to store for a use at a later date.</p> <p>We also allow children to be independent as much as possible with the technology, for example turning on the IWB using the</p>

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remote, using the IWB for class dojos and moving between screens (rather than an adult doing it for the child).

Algorithms - In Year 1 we develop the fundamental skills of algorithms and de-bugging through an understanding of creating processes and change. This includes creating algorithms using pens and paper, writing instructions and creating basic flow charts. For example the children create a superhero board game that used simple processes (forward, left, right) to move a lego man across the board to rescue his friend. Children also engage with technology such as Beebots within maths lessons, programming the beebot to move around a grid on the floor. We link these to our Talk4 Write stories and walk the Beebot through our story maps. They then use these skills to engage with apps online that follow the same virtual coding methods such as *Beebot app*.

Common uses of technology - Children are encouraged to identify the technology we have around the school and become familiar with recognising how it can make things quicker or easier for us. For example, using the motion-censored flush system in our toilets or photocopying their work in the school office.

Use technology safely - In Year 1 we have stand-alone lessons that support children to understand how to protect themselves online through videos *Hector's World*. The children also receive a

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Year 1 and 2 Students will:

- 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
- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- recognise common uses of information technology beyond school

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

visit from the NSPCC Team who provide children with information through an assembly.

Class 2 - Year 2 & Year 3

students use iPad technology to understand the step by step process of algorithms, following precise instructions in order to complete a task (A.L.E.X). Children also learn how to create and debug programs using the app Kodable. Students develop skills that use sequence and repetition in programs.

This is then recorded with screen grabs for the children's books and children writing explanations of their processes.

Both of these apps help student's logical processing in predicting results of their actions.

Students use laptops to create Microsoft Office documents including Word and PowerPoint – as part of this they create documents, store them in a folder, retrieve and manipulate them, including use of font size and colour, varying types of font and copying and pasting items from one document to another.

Students are taught the use of computers outside of school, such as televisions, games consoles, washing machines, phones,

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cameras, toothbrushes and how information technology is everywhere.

Students are taught how to use search engines to find specific information (details of volcanoes as part of Geography work) as a form of research (cross curricular as part of many different subjects).

Students learn about social media and keeping personal information safe. Learn via Lee and Kim e-safety video on YouTube, create an advertising poster displaying the 4 rules to internet safety and answer hypothetical questions to display their understanding.

As part of Inventions and Inventors topic, the children learn about the invention of the computer with Charles Babbage, through to modern pioneers such as Tim Berners-Lee and Bill Gates. Students are taught about the advent of Social Media, its benefits and dangers and how to act responsibly, gaining an understanding of what is acceptable and what is not acceptable behaviour online.

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<p><u>IMPACT:</u></p> <ul style="list-style-type: none"> • 	<p><u>FUTURE FOCI (to inform action plan or SIP):</u></p>
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KS2 Computing

Intent - What is taught? (Objectives) Beyond?	Implementation – When, How, Where and Why?
<p><u>Year 3, 4, 5 and 6 Students will:</u></p> <ul style="list-style-type: none"> • 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 	<p><u>Class 2 – Year 3</u></p> <p>As part of A.L.E.X, children design and debug their own programs to enable the robot to reach its destination. This includes debugging as a process of trial and error, using logical reasoning, decomposing instructions into smaller parts to obtain the goal. As a result, the students can detect any errors and make the relevant corrections, noting in their workbooks the processes they followed.</p> <p>Students are taught how to select items for transferring via controlling keyboard to highlight specific areas and how to follow a specific sequence when transferring this input and output. Students are introduced to communication methods used via the internet, including e-mail, social media and text messaging, with focus on the safe usage of any form of communication and what constitutes acceptable or unacceptable behaviour online.</p>

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- 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.

Students also use technology as part of their everyday tasks, including researching subjects for Geography (volcanoes), History (famous figures such as Queen Victoria, Florence Nightingale, Edith Cavell etc.), Art (Salvador Dali), as well as helping with English and Maths activities.

Class 3 - Year 4, 5 & 6

The Computing Curriculum in these classes are taught through the following projects, although, towards the end of this section there is some explanation as to how Computing is used practically in other elements of the curriculum:

MicroBits – Students code physical device (computer chipboard) which can perform many functions. Students take part in projects that require them to use software and programming language (incl. JavaScript) to control the physical device to produce outputs such as: sending messages to other devices; developing games; enabling devices to display codewords; enabling devices to be used as a measuring tool for investigations, such as conductivity testing or reaction time testing.

During the above projects, students will need to design, write and debug programs to achieve these goals. They will also become familiar with sequencing, selection and repetition, using computing language such as 'IF, THEN, ELSE' in their algorithms.

Code.org – Students design their own 'apps' using programming (incl. JavaScript). This uses 'Scratch' as a foundation, to help

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support the fundamentals of sequencing, selection and variables to input/output of the given program.

This project also delves into the purpose of programming teaching and its application to the modern world.

iPad Coding (apps incl. 'Robot' and 'CargoBot') – The apps are used to teach 'debugging' and efficiency specifically by students being posed problems that require programs to use repeating algorithms. For example, students have to control a 'simulated' cargo crane that needs to move cargo in a specific order in the most efficient method – these programs often need debugging and adapting to meet the desired criteria.

Paper-based coding – To support their understanding of coding, especially the language used in this, students take part in paper-based reasoning activities. For example, they have to 'program' a piece of paper or set of instructions to make an unbeatable game of *Noughts and Crosses*, using programming language, such as 'IF, THEN, ELSE'.

CEOP E-safety – to develop the safe use of technology, students are introduced through videos from CEOP which outline the safe use of technology as well as the dangers that can be presented through the use of social media, for example. This is supported by students creating two of their own (paper-based) social media sites – a good example and a bad example – with explanation of the privacy and safety settings, as well as an option to report unacceptable behaviour.

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General ICT usage – Students use technology alongside their everyday lessons and school life to accomplish a multitude of tasks.

For example, they develop their knowledge of search engines when using these to research subjects in class or to filter information that is appropriate for their age and safe to look at (e-safety link).

Students present information by combining a range of programs and software. For example, they may use the Internet to research information, but then use this in presentations alongside the use of images/photos they have taken using iPads. Students also present findings to maths/science investigations using spreadsheets and tabling/graphing tools, for example, in science students compare the gestation periods of different mammals by creating line graphs.

Students store and retrieve their work safely by using the school's internal network.

For distance/remote learning, students understand that ClassDojo can be used to communicate their work across the Internet network, using a range of media to support learning during school closure or illness.

Year 6 students at Greater Depth will (key stage 3):

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<ul style="list-style-type: none">• use two 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]	<p>Students start to develop their knowledge of JavaScript (as stated above) if they are very secure with the pre-created 'block' programming devices, used to introduce programming concepts.</p> <p>Students are extended to use further Boolean logic and language during MicroBit projects (as stated above), in addition to 'IF, THEN, ELSE' already introduced. This allows students to access more complex programming scenarios, where they can control their physical system/chipboard to perform more advanced tasks.</p>
<p><u>IMPACT:</u></p>	<p><u>FUTURE FOCI (to inform action plan or SIP):</u></p>