Computing @ Brockwell

Introduction

At Brockwell we aim to give **all** children access to an engaging and inclusive STEM curriculum (Computing and D&T) focussing on high quality 'computational thinking' and reasoning skills. Keeping safe in an ever-changing, digital world underpins our entire STEM curriculum and is taught implicitly across all areas of the curriculum. We aim for all children to be able to succeed in the digital world, by the end of KS2. Children will develop an acute awareness of the dangers faced in the digital world and gain the necessary skills to deal with these appropriately.

Through real, relevant problems, within a variety of contexts and STEM projects, all children have the opportunity to explore systems and gain an understanding of how they can use technology to **change the world**. At Brockwell, we ensure all children have access to the internet and online resources. Children who do not have access at home will be allowed supervised time online in school.

At Brockwell, we are beginning to combine elements of the Computing and Design Technology curriculum to pioneer a new KS2 STEM curriculum. Children will explore STEM projects throughout the year; making, designing and coding physical systems that can be used in the real world. The STEM curriculum encapsulates all the key principles of the computing and DT curriculum.

Computing is broken down into three core principles: Computer Science, Information Technology and Digital Literacy. Design and Technology is broken down into the core principles: Design, Make, and Evaluate.

Intent

Through teaching Computing, we intend to equip our children to participate in a rapidly changing world where work and leisure activities are increasingly transformed by technology. Computing encompasses a whole range of interconnected disciplines required to help understand and change the world. We believe that 'Digitally Proficiency' and 'Computational thinking' are skills children must be taught, if they are to be able to participate effectively and safely in this digital world. We want all pupils at Brockwell to experience the magnificence, power and enjoyment of Computing and to develop a sense of inquisitiveness about the subject. We acknowledge the importance of these skills being coupled with a clear understanding of digital literacy. We want to harness the power of computing and technology to inspire and instil a sense of wonder. Children will use technology to '*understand seemingly very complex things in one's environment'*. A high-quality computing education equips pupils to use 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. At Brockwell, computational thinking underpins the entire curriculum. Children are encouraged to celebrate mistakes and 'debug' their own thinking. Throughout KS2, children are introduced to a wide range of programming tools and languages, allowing them to continually practice and improve the skills they learn. At Brockwell, the children have access to iPads and a computing suite to provide them with regular access to up to date technology. This ensures they become

digitally literate so that they are able to express themselves and develop their ideas through information and computer technology– at a level suitable for the future workplace and as active participants in a digital world. At Brockwell, children will follow the NCCE scheme of work, which is supplemented by additional STEM projects and themed days.

Children are exposed to a curriculum that enables children to become effective users of technology who can:

- Understand and apply the essential principles and concepts of Computer Science, including logic, algorithms and data representation;
- Analyse problems in computational term, and have repeated practical experience of writing computer programs in order to solve such problems;
- Evaluate and apply information technology analytically to solve problems;
- Communicate ideas well by utilising appliances and devices throughout all areas of the curriculum.

Implementation

At Brockwell, STEM is taught using two different approaches; a blocked curriculum approach in Year 6 and weekly STEM lessons in Years 3, 4 and 5. This ensures children are able to develop depth in their knowledge and skills over the duration of each of their computing topics. STEM coordinators have used the NCCE 'Teach Computing' scheme, alongside other resources, as a starting point for the planning of the new STEM curriculum. Where possible, staff are encouraged to make links with other subject areas such as reading and maths. We have a computing suite and access to 120 iPads across school, to ensure that all year groups have the opportunity to use a range of devices and programs for many purposes across the wider curriculum. Employing cross-curricular links motivates pupils and supports them to make connections and remember the steps they have been taught.

The implementation of the curriculum also ensures a balanced coverage of computer science, information technology and digital literacy. The children will have experiences of all three strands in each year group, but the subject knowledge imparted becomes increasingly specific and in depth, with more complex skills being taught, thus ensuring that learning is built upon. For example, children in Lower Key Stage 2 learn what algorithms are, which leads them to the design stage of programming and in Upper Key Stage 2, where they design, write and debug programs, explaining the thinking behind their algorithms. All Year groups have access to physical programmable devices, ranging from Blockly (Dot and Dash) to Micro:bit and Crumble Controller. Design and Technology skills are embedded, where appropriate, with physical programming lessons, such as building buggies and making robot masks. All year groups develop their designing and building skills during engaging K'Nex challenge days. Food technology is introduced in LKS2, focussing on knife skills and the healthy living plate. In UKS2 children will work in and open a school 'restaurant'.

Impact

We encourage our children to enjoy and value the curriculum we deliver. We will constantly ask the WHY behind their learning and not just the HOW. We want learners to discuss, reflect and appreciate the impact computing has on their learning, development and well being. Finding the right balance with technology is key to an effective education and a healthy life-style. We feel the way we implement computing helps children realise the need for the right balance and one they can continue to build on in their next stage of education and beyond. We encourage regular discussions between staff and pupils to best embed and understand this. The way pupils showcase, share, celebrate and publish their work will best show the impact of our curriculum. We also look for evidence through reviewing pupil's knowledge and skills digitally through Seesaw. Progress of our computing curriculum is demonstrated through outcomes and the record of coverage in the process of achieving these outcomes.