Broadway Junior School

Subject: Computing Topic: Introduction to Python Year: 6 Term: Spring 2

NC Purpose of Study
A high-quality computing education equips 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 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, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – 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.

Intent	Implementation	Impact
Our vision at Broadway Junior School is that all pupils should enjoy Computing and become confident, passionate and responsible users of technology both inside and outside of school. Through interesting, relevant and inclusive lessons, they will be able to leave Year 6 with a good understanding of how computers and the Internet work, along with being able to complete tasks on them creatively, independently and reflectively for a range of purposes and audiences. The Computing curriculum at Broadway is designed to enable pupils to embrace and utilise new technologies through the application of essential knowledge, principles and concepts. Technology is everywhere and will play a pivotal part in students' lives, therefore, we want to model and educate our pupils on how to use technology positively, responsibly and safely. We want our pupils to be creators, not just consumers of content and our broad curriculum encompassing 'Coding & Computational Thinking', 'Information Technology', 'Computing Systems & Networks' and 'Online Safety' reflects this. We recognise that the best prevention for a lot of issues we currently see with technology and social media is through education.	Computing skills are taught explicitly at Broadway with every pupil receiving dedicated Computing lessons throughout each half-term. Each half-term has a focus on either Information Technology, Coding & Computational Thinking or Computing Systems & Networks with Online Safety lessons also included throughout each half-term. The skills acquired are then embedded throughout the curriculum. Learning is sequenced to build knowledge, skills and vocabulary. Throughout units of work teachers encourage children to make links between past learning and new content. We recognise prior learning and build on it with memorable learning experiences and provide targeted support where necessary. The units address the requirements of the National Curriculum and are broken down to cover all elements of the different strands of Computing. The progression of knowledge and skills statements build year on year to deepen and challenge our learners. We use Purple Mash as the core of our curriculum tied with Teach Computing and activities from Project Evolve to create a comprehensive curriculum providing full curriculum coverage and a variety of skills for our children.	The impact of our Computing curriculum is that we provide pupils with a set of skills to embed a lifelong love of learning and that they build on the knowledge and skills from previous learning. We ensure that every child can become a confident user of technology, while being able to use it to accomplish a wide variety of goals, both at home and in school. Children will have a secure and comprehensive knowledge of how technology works in the world around them and will develop their understanding of how to deal with online situations safely. Children will become confident global citizens. The knowledge organisers outline what we want the children to know within each unit. By nature Computing is going to be practical and hands on. We give the children the opportunity to record individually their responses to key questions. Teachers ensure that children understand and apply the correct vocabulary linked to different elements of the curriculum and this is also recorded within the floor books. Prior and future learning links are also included, so that there is a clear sequence in relation to the progression of skills and activities.

Key Vocabulary
Command Co-ordinate Floating Point Number Floor Division Function Library Loop Modulo Operator Print Sleep Sprite String Range Variable

Knowledge	Skills
• To understand that Python is a text-based coding language and enter simple commands. • To use Python to perform mathematical calculations. • To be able to use repetition and Python library functions. • To understand how Python in Pieces can be used to program a graphical user interface.	• I can explain what Python is and compare it to block-based coding. • I know Python has strict rules that must be followed for code to work. • I can use quotes, brackets and capitals correctly in my code when printing messages to screen. • I can debug errors in simple commands. • Preparation • I can type simple number calculations in Python. • I can use Python to solve maths problems. • I can debug errors in mathematical commands. • I can explain why repetition is used in some computer programs. • I understand what a 'for loop' is and can use 'for loops' in my programs. • I can import a function from the Python library. • I can use the sleep function to control the speed of my code. • I can explain what a graphical user interface is.

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	• I know what a sprite is and how to change its position on screen. • I can use 'sleep' function to control the timing of movement.

Learning Objectives/End Points			
To understand that Python is a text-based coding language and enter simple commands. Lesson 1	To use Python to perform mathematical calculations. Lesson 2	To be able to use repetition and Python library functions. Lesson 3	To understand how Python in Pieces can be used to program a graphical user interface. Lesson 4

Careers

Linking Curriculum Learning to Careers
Discuss how the skills developed in this unit are used in a range of careers, including:

Python Developer
Software Developer
Software Engineer
Computer Programmer
Data Scientist
Data Analyst
Artificial Intelligence Engineer
Machine Learning Engineer
Video Game Programmer
App Developer
Web Developer
Robotics Engineer
Automation Engineer
Software Tester
Scientific Researcher
Computer Science Teacher

Transferable skills Logical thinking: Following Python syntax and understanding how commands are executed in sequence.
Problem-solving: Using mathematical operators and programming commands to solve practical problems.
Debugging: Identifying, explaining and correcting syntax and calculation errors.
Computational thinking: Using loops and repetition to make programs more efficient.
Mathematical reasoning: Applying calculations, floor division and modulo operations within code.
Attention to detail: Using quotation marks, brackets, capitalisation and commands accurately.
Creativity and design: Creating graphical user interfaces and controlling the position and movement of sprites.
Resilience and independent learning: Testing code, learning from errors and improving programs through repeated attempts.

Learning from career and labour market information
Explore how programming skills are used in growing areas such as software development, data science, artificial intelligence, gaming and automation, including opportunities across the North East.

Addressing the needs of each pupil
Provide step-by-step coding instructions, worked examples and scaffolded challenges. Offer opportunities for pupils to debug independently and extend their programs according to their confidence and ability.

Linking curriculum learning to careers
Apply Python commands, mathematical operators, variables, loops and library functions to create working programs, reflecting the coding and problem-solving skills used in technology-related careers.

Encounters with employers and employees
Explore how programmers use Python to solve problems and develop applications. Where possible, invite a software developer, games programmer or computing professional to discuss their work.

Experiences of workplaces
Set practical programming challenges inspired by real tasks, such as automating calculations, repeating instructions efficiently or controlling the movement of a sprite on screen.

Encounters with further and higher education
Introduce pupils to computing pathways through secondary education, college, university degrees, technical qualifications and apprenticeships, including opportunities to develop text-based programming skills.