Curriculum for Computing at Dr. Walkers

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.

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.

Key Skills – children will cover a range of activities (examples given below) across Key Stage 1 to support learning in the following aspects:

Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- Putting instructions into order
- Flow charts
- Understand precise instructions before programming Bee-Bots

Create and debug simple programs
- Using Bee-Bots – pupils direct a Bee-Bot across a grid to a set destination, learning simple programming and debugging skills
- Pupils begin to write and record instructions for drawing a rectangle in Logo

Use logical reasoning to predict the behaviour of simple programmes
- Pupils learn to programme and predict how floor robot may move to make different shapes
- Pupils programme control devices and predict their movements based on instructions

Use technology purposefully to create, organise, store, manipulate and retrieve digital content
- Gather data to make cards for sorting eg mini beasts
- Finding information from Internet – saving it, organising it and using it
- Yes /no diagrams to begin to use branching databases

Recognise common uses of information technology beyond school
- Robots – how they function and how they are used in society
- How a supermarket works – how information is used in a supermarket
- How computers are used to help farmers

Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about internet
- Internet safety lesson – pupils explore benefits and dangers of the internet, looking at how they can stay safe on line

Key skills - children will cover a range of activities (examples given below) across Key Stage 2 to support learning in the following aspects:

Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- The basics of Scratch programming

Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- Follow instructions for how to create a simple program for example involving traffic lights appearing and disappearing in sequence
- Input/output – consolidate learning about input/output

Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programmes
- Exercises to describe how algorithms work

- Human crane algorithm – pupils create and test crane algorithms that move blocks from one bowl to another
- Jam sandwich algorithm – use simple programming language to write an algorithm to instruct Sandwichbot 2000 to create a sandwich

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

- How the internet works
- Internet research: fact or fiction – internet can be used for research and publishing information

Using search technologies effectively, appreciate how results are selected and ranked and be discerning in evaluating digital content

- How to find information quickly and evaluate the information
- Internet research for project work

Select, use and combine a variety of software including internet services on a range of digital devices to design and create a range of programmes, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

- Databases
- Powerpoint presentations
- Publishing
- Web design – pupils build a web page based on their hobbies – how a page is built, and what elements needed for a successful site

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

- E Safety unit of work including cyberbullying and its consequences, the risks associated with different communication tools and how they can stay safe online
- Y6 attend 'Crucial Crew' where children spend time with experts looking at a range of potential risks and how to keep themselves safe including Internet Safety.