Computing @ Broad Heath Primary School

At Broad Heath computing is an essential and expected tool that underpins everyday teaching and learning. Our Broad Heath Computing Curriculum follows the aims set out in the National Curriculum, but we also look at the needs and gaps in knowledge of out children and provide them with opportunity to gain those skills, particularly thinking about secondary school and even future careers.

Teachers are provided with high quality resources and technology to support their delivery of all areas of the curriculum.

Pupils have access to inspiring and motivational software and hardware to acquire the maximum learning and development from every learning opportunity. Children should gain a respect and awareness of the advantages, but also the dangers when using online devices.

Computing

The aim of this document is to provide an overview to the Computing Curriculum and a programme of study across the Key Stages.

The Computing Curriculum can be divided into three inter-related strands:

- Computer Science

- Information Technology

- Digital Literacy

Computer Science:

This strand of the curriculum links closely to the control element of the old ICT curriculum.

Pupils need to understand what algorithms are – this is the basis of what they need to know in order to write computer programs. Each programming language has its own vocabulary and grammar but they all follow the same type of logic. It is possible and beneficial to learn computer science away from computers or other digital devices. Role play and kinaesthetic activities can help pupils develop logical reasoning.

Pupils need to be able to write algorithms and programs. They also need to be able to find mistakes (bugs) and fix them. When children write programs they will learn that there are often different ways of getting the right outcome, and they need to be able to evaluate the programs to decide which is the most efficient.

While children will make mistakes in their own programs it is often easier to find mistakes in code that has been produced by other people. Providing pupils with example programs give them the opportunity to predict what they will do and identify any bugs. Working collaboratively is also an

effective method. As pupils get older the programs they write will become more complicated. They will need to use sequence, selection, repetition and variables in their programs.

The computer science strand also requires knowledge of networks and how searches are performed.

Information Technology:

This strand of the curriculum equates to what was most of the areas from the old ICT scheme of work. Most of it can be covered by using technology to support other subject areas though it may be necessary to teach some discrete skills. Students should understand that technology is everywhere, be able to identify the technology they encounter and have a basic understanding of how it works. This will link to work on programming and algorithms.

Appropriate activities include word processing, creating images, taking and using photographs and video, creating music and animations, using and creating databases, producing websites and contributing to blogs. As well as creation of digital materials pupils should have experience of manipulating and editing their own work and resources from elsewhere. They need to know how to use the tools available but also to have an element of digital literacy – awareness of audience and good design principles. Pupils should experience a range of different applications and software, initially the teacher will select the programs they use but over time pupils should be encouraged to make decisions themselves.

Pupils also need to know how to store and organise their files so that it can easily be found again. They need an understanding of the devices they can use including: hard drives, USB sticks, school network server, and the cloud storage on the internet.

Digital Literacy:

Children need to be able to use technology safely. They need to keep their personal information private and treat other people with respect. If something goes wrong or they see something they don't like they should know what to do and where to go for help. As children get older they need to know about how to use technology responsibly. As well as thinking about how their online behaviour affects others, they need to be aware of legal and ethical responsibilities, including respecting copyright and intellectual property rights, keeping passwords and personal data secure and observing terms and conditions for online services. They need to understand the main risks relating to:

Content – being exposed to illegal, inappropriate or harmful material
Contact – being subjected to harmful online interaction with other users
Conduct – online behaviour that increases the likelihood of, or causes, harm

Children should understand an age appropriate version of the school's Acceptable Use Policy. E-Safeguarding should link with the school's general child protection policy and should not be seen as a separate issue.

The national curriculum for computing has four main 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.

Assessment

By the end of each Key Stage, pupils are expected to know, apply and understand the matters, skills and processes outlined in the relevant programme of study.

Glossary of Terms

Abstraction

Only focussing on the details relevant to the task, in computing this may be by using a database to handle data. In doing this the data can be looked at in specific groups. An example is using Target Tracker to show the progress of pupils on Pupil Premium.

Logic

The non-arithmetic operations performed by a computer, such as sorting, comparing, and matching, that involve yes-no decisions. This might be completed using programs such as Excel or Flowol.

Algorithms

The step-by-step procedure for a machine to complete a task, for example the instructions given to a pro-bot to guide it round a track, or the instructions put into a bee-bot to guide it through a maze.

Data Representation

The way in which information is presented. In its simplest form this could be representing a data set as a graph. However it is also using the appropriate software for the task. Not everything has to be done in Word or PowerPoint.

Key Stage 1

By the end of Key Stage 1 children should be able to:

- 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
- Use technology safely and respectfully, keeping personal information private; know where to go for help and support when they have concerns about material on the internet
- Recognise common uses of information technology beyond school

Key Stage 2

By the end of Key Stage 2 children should be able to:

- 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 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
- Use technology safely, respectfully and responsibly; know a range of ways to report concerns and inappropriate behaviour
- Select, use and combine a variety of software (including internet services) on a range of digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information