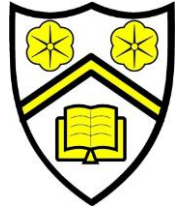


## **WHITEHILL COMMUNITY ACADEMY (3-11)**

### **A rationale for the Teaching of Computing**



#### **Our INTENT in Computing:**

At Whitehill Community Academy, we aim to ensure that we deliver a high-quality computing curriculum that equips pupils to use computational thinking and creativity to understand and change the world.

We believe that Computing has deep links with mathematics, English, History, Geography, 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.

#### **STEM at Whitehill through Enrichment and the Computing Curriculum**

All children are curious about the world around them and how things work. At Whitehill Academy we aim to foster inquiring minds, logical reasoning, and collaboration to prepare them for a world where skills in science, technology, engineering and maths are increasingly important. In our Computing Curriculum we provide a wealth of opportunities for pupils to engage in practical investigation making links between science, maths, technology and developing engineering skills. This helps to encourage critical and creative thinking and makes the acquisition of knowledge and skills relevant and interesting.

As an Academy we try to integrate the STEM subjects into the Computing Curriculum, encouraging children to think independently and find solutions to problems. In computing science, pupils study a varied curriculum and learn to develop their practical investigative skills by making predictions, planning and carrying out experiments; selecting and using appropriate materials; calibrating accurately; observing and recording methodically; communicating discoveries and critically evaluating their results. Children consider issues which affect their own lives, and the lives of others.

#### **Computing unit aims (Taken from the NC)**

##### **Aims include:**

- 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
- are responsible with using the internet and social networking safely and respectfully and are aware of potential incidents and how to report these
- can understand the concepts of; devices, hardware and connectivity

## **IMPLEMENTATION of Computing:**

### **Computing overview for EYFS, KS1 and KS2**

At Whitehill our curriculum covers the National Curriculum compulsory programmes of study: **Computer science, Digital Literacy and Information Technology**. These three main areas are then broken down into computing skills that all year groups follow. They develop their skills in each area as they progress through school. The computing skills are broken down into the following headings;

### **Algorithms, Programming and Development, Data and Data Representation, Hardware and Processing, Communication and Networks, Information Technology (IT)**

Year group	Autumn	Spring	Summer
Nursery	Children are initially taught through educational games that help to develop their mouse and keyboard skills. They are introduced to the key health and safety aspects of using ICT equipment. In the foundation stage setting the children access a variety of ICT resources such as; bee bots, metal detectors, sound recorders, speak-easy listening stations and light boxes. As these skills are developed they are taught an understanding of technology in our lives using software to simulate technology that they use in their own home such as; a washing machine, using a CD player etc.		
Reception			
Year 1/Year 2	Algorithms, Coding, Logical Reasoning  Information Technology  E-Safety	Information Technology  E-Safety  Computing Beyond School  Algorithms, Coding, Logical Reasoning	E-Safety  Algorithms, Coding, Logical Reasoning
Year 3/Year 4	Creating programs  Coding	Logical Reasoning  Networking	Information Technology  E-Safety
Year 5/Year 6	Creating programs Coding	Logical Reasoning Networking Searching	Information Technology E-Safety

## Computing curriculum

### Foundation Stage

During the Computing sessions or in the EYFS setting the children cover the following objectives which are from the Technology section of the Early Years Outcomes DfE document.

- Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images.
- Knows that information can be retrieved from computers.
- Completes a simple program on a computer.
- Interacts with age-appropriate computer software.

**Software/Hardware used to support these objectives include; bee bots, metal detectors, sound recorders, speak-easy listening stations and light boxes. Sherston Resource Pack, Purple Mash VLE, Early essentials, Easykeezy and type with Tizzy (Keyboard skills).**

### Year 1.

**Autumn: (CS1a)** understand what algorithms are **(CS1b)** Create simple programs

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.

**Software/Hardware used to support these objectives include; Bee-Bots, 2 Simple Modelling toolkit, 2 Simple Go (Purple Mash), Early essentials, 2 Simple DIY, 2 Code and espresso coding.**

**Spring: (IT1a)** Use technology purposefully to create digital content **(IT1b)** Use technology purposefully to store digital content **(IT1c)** Use technology purposefully to retrieve digital content **(DL1c)** Recognise common uses of information technology beyond school

Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Recognise common uses of information technology beyond school.

**Software/Hardware used to support these objectives include; 2 Simple Publish+, Saving work to online VLE, Easykeezy and type with Tizzy (Keyboard skills).**

**Summer: (DL1a)** Use technology safely **(DL1b)** Keep personal information private

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.

**Software/Hardware used to support these objectives include; 2 Simple Publish+, Saving work to online VLE, Easykeezy and type with Tizzy (Keyboard skills). These programmes are used to promote e-safety.**

### Year 2.

**Autumn: (CS2a)** Understand that algorithms are implemented as programs on digital devices **(CS2b)** Understand that programs execute by following precise and unambiguous instructions

**(CS2c)** Debug simple programs **(CS2d)** Use logical reasoning to predict the behaviour of simple programs.

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.

**Software/Hardware used to support these objectives include; Lego Fixit, Dr Who, Code.ORG, 2 Simple DIY, Espresso Coding, 2 Simple Code**

**Spring: (IT2a)** Use technology purposefully to organise digital content. **(IT2b)** Use technology purposefully to manipulate digital content.

Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

**Software/Hardware used to support these objectives include; 2 Simple Publish+, 2 Simple Mylayout, Sherston Storycraft, Webcams, 2 Simple Paint, Picture Saving work to online VLE and local network, Copy/past images and labelling**

**Summer: (DL2a)** Use technology respectfully. **(DL2b)** Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

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.

**Software/Hardware used to support these objectives include; E-Safety Leaflets with 2 Simple Publish +**

### Year 3.

**Autumn: (CS3A)** Write programs that accomplish specific goals. **(CS3B)** Use sequence in programs. **(CS3C)** Work with various forms of inputs. **(CS3D)** Work with various forms of outputs.

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

**Software/Hardware used to support these objectives include; Lego fix it, Dr Who, Code.org, Espresso Coding, Purple Mash 2Code, Scratch**

**Spring: (CS3F)** Use logical reasoning to detect and correct errors in programs. **(CS3G)** Understand computer networks, including the internet. **(DL3A)** Understand the opportunities computer networks offer for collaboration.

Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

**Software/Hardware used to support these objectives include; Lego fix it, Dr Who, Code.org, Espresso Coding, Purple Mash 2Code, Scratch**

**Summer: (IT3D)** Design and create content. **(IT3C)** Collect information. **(IT3E)** Present Information. **(DL3A)** Use technology safely, respectfully and responsibly. **(DL3B)** Identify a range of ways to report concerns about contact.

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.

**Software/Hardware used to support these objectives include; Sherston Broadband Detectives, Microsoft Publisher to create an E-Safety poster.**

#### Year 4.

**Autumn: (CS4A)** Design programs that accomplish specific goals. **(CS4B)** Design and create programs. **(CS4C)** Debug programs that accomplish specific goals. **(CS4E)** Control or simulate physical systems. **(CS4D)** Use repetition in programs.

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.

**Software/Hardware used to support these objectives include; Code.org, Tinker, Espresso Coding, Lego We-Do, Scratch.**

**Spring: (CS4F)** Use logical reasoning to detect and correct errors in programs. **(CS4G)** Understand computer networks, including the internet. **(DL4A)** Understand the opportunities computer networks offer for collaboration.

Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

**Software/Hardware used to support these objectives include; Finding and saving work on LAN, Accessing work on VLE, Code.org, Tinker, Espresso Coding, Lego We-Do, Scratch.**

**Summer: (IT4E)** Collect data. **(IT4F)** Present data. **(DL4B)** Identify a range of ways to report concerns about content. **(DL4C)** Recognise acceptable/unacceptable behaviour.

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.

**Software/Hardware used to support these objectives include; Junior viewpoint (Rainfall Data), Purple Mash Database (2 Investigate) Sherston Broadband Detectives, Microsoft Publisher/2 Publish+ to create an E-Safety leaflet.**

#### Year 5.

**Autumn: (CS5B)** Use selection in programs. **(CS4D)** Use repetition in programs. **(CS5C)** Work with variables. **(CS5B)** Use selection in programs. **(CS5C)** Work with variables.

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.

**Software/Hardware used to support these objectives include; Espresso Coding, HTML Programming, Python Programming, 2 Code, Code Monkey, Code.org, Kodu**

**Spring: (CS4F)** Use logical reasoning to detect and correct errors in programs. **(CS5D)** Use logical reasoning to explain how some simple algorithms work. **(CS5E)** Use logical reasoning to detect and correct errors in algorithms. **(CS4G)** Understand computer networks, including the internet. **(CS5F)** Understand the opportunities computer networks offer for communication. **(DL4A)** Understand the opportunities computer networks offer for collaboration. **(CS5G)** Appreciate how search results are ranked. **(DL5B)** Be discerning in evaluating digital content.

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.

**Software/Hardware used to support these objectives include; IP Address Systems, Binary, Networks, Difference between Internet and World Wide Web, Finding and saving work on LAN, Accessing work on VLE, Code.org, Tinker, Espresso Coding, Lego We-Do, Scratch.**

**Summer: (IT5C)** Analyse Data. **(IT5D)** Evaluate Data. **(IT5A)** Combine a variety of software to accomplish given goals. **(IT5B)** Select, use and combine software on a range of digital devices. **(IT5E)** Design and create systems. **(DL3A)** Use technology safely, respectfully and responsibly. **(DL3B)** Identify a range of ways to report concerns about contact. **(DL4B)** Identify a range of ways to report concerns about content. **(DL4C)** Recognise acceptable/unacceptable behaviour.

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.

**Software/Hardware used to support these objectives include; Junior Viewpoint Inventors Database, Lego Robotics, Design and Create a car (CAD), F1 Silhouette, Microsoft Publisher to create Portfolio and leaflet about E-Safety.**

## Year 6.

**Autumn: (CS3B)** Use sequence in programs. **(CS5B)** Use selection in programs. **(CS4D)** Use repetition in programs. **(CS5C)** Work with variables. **(CS3C)** Work with various forms of inputs. **(CS3D)** Work with various forms of outputs. **(CS5B)** Use selection in programs. **(CS4D)** Use repetition in programs. **(CS5C)** Work with variables.

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.

**Software/Hardware used to support these objectives include; Espresso Coding, HTML Programming, Python Programming, 2 Code, Code Monkey, Code.org, Kodu, Code Combat**

**Spring: (CS4F)** Use logical reasoning to detect and correct errors in programs. **(CS5D)** Use logical reasoning to explain how some simple algorithms work. **(CS5E)** Use logical reasoning to detect and correct errors in algorithms. **(CS4G)** Understand computer networks, including the internet. **(CS5F)** Understand the opportunities computer networks offer for communication. **(DL4A)** Understand the opportunities computer networks offer for collaboration. **(CS5G)** Appreciate how search results are ranked. **(DL5B)** Be discerning in evaluating digital content.

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.

**Software/Hardware used to support these objectives include; IP Address Systems, Binary, Networks, Difference between Internet and World Wide Web, Finding and saving work on LAN, Accessing work on VLE, Code.org, Tinker, Espresso Coding, Lego We-Do, Scratch, Code Combat, Lego Robotics.**

**Summer: (IT5C)** Analyse Data. **(IT5D)** Evaluate Data. **(IT5A)** Combine a variety of software to accomplish given goals. **(IT5B)** Select, use and combine software on a range of digital devices. **(IT5E)** Design and create systems. **(DL3A)** Use technology safely, respectfully and responsibly. **(DL3B)** Identify a range of ways to report concerns about content. **(DL4B)** Identify a range of ways to report concerns about content. **(DL4C)** Recognise acceptable/unacceptable behaviour.

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.

**Software/Hardware used to support these objectives include; Database Extreme Earth, Creating advert Garage Band, Podcasting, Lego Robotics, Design and Create a car (CAD), F1 Silhouette, Microsoft Publisher to create Portfolio and leaflet about E-Safety.**

In addition to the National Curriculum for Computing being covered at Whitehill the children also benefit from cross curricular links throughout a variety of subjects through enhanced, weekly Computer sessions.

## **IMPACT of Computing:**

### **Assessment, Recording and Monitoring:**

It must be remembered that the process more than the outcome is the important issue when assessing Computing. Wherever possible assessment is planned into schemes of work and is used both formatively and diagnostically, helping teachers to meet the developmental needs of each pupil.

A new Computing assessment scheme is being implemented throughout the school based on end of term assessment outcomes from Purple Mash. The scheme uses the National Curriculum programs of study alongside Purple Mash applications and VLE. This enables the monitoring of current and the end of unit outcomes for all children.

A portfolio of work is kept with examples of work for each child in each year group accessible through the VLE. This consists of work saved on a week by week basis. All children are assessed at the end of each unit however identified children are monitored weekly in order to monitor the progression of learners in each class.

The levels of attainment in Computing will transfer with each child as they progress through all of the Key Stages. The information will then be given to the relevant Key Stage co-ordinator when the children transfer to KS3.

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Children's progress will be entered and monitored on DCPro on a termly basis.

**Subject Leaders: Andy Smith, Dean Williams, David Hepplestone – January 2020**