Overview of what the subject entails

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.

Additionally, we also look at computational thinking, by which it means to think logically, sequentially and to be resilient, independent problem solvers. Computational Thinking is taught continually through the Computing curriculum, as problems can arise in all areas of Computing, and our children need to be able to calmly and logically overcome issues they face.

We build on the knowledge and understanding gained throughout the curriculum, so that 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, 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.

Why we teach it

Computing and Computational Thinking are vital skills that are imperative in the modern technology-centric world that we live in. According to the 'IBA' website (Insite for Action, October 30th 2023, written by Andy Woolley) there are 3 key takeaways;
- Over 80% of job vacancies in the UK require some level of digital skills.
- Developing digital skills is becoming increasingly important for career advancement.
- Employers must invest in digital skills development to stay competitive in today's market.

According to a report by the UK government's Industrial Strategy;
- It is estimated that by 2030, around 90% of all jobs in the UK will require some level of digital skills.

This means, that if pupils leave school without a competitive computing knowledge, then they are already behind their peers and at a severe disadvantage, which is not acceptable at Whitegate End.

Key teaching principles

Unplugged Learning: Learning through drama and written language – learning computer skills without a device.

Tinkering: Pupils learn through experimentation. Pupils are given the opportunity to try out new technology without being shown how to use the equipment and they are given the opportunity, through trial and error, to work things out for themselves.

Creation, Correction and Modification: Pupils are given the opportunity and direction to create a program, correct any issues that they have encountered, as well as modify and adapt their creation for different purposes.

Problem Solving: Pupils are given part-complete work, incomplete work or incorrect work and they are required to ensure that it becomes a working model once again through solving whatever problem they discover. Also known and referred to as Computational Thinking.

Evaluation: Pupils are required to evaluate a task which they have completed (creation, correction, modification or problem solving) considering whether it meets the initial requirements that were set out for them, where they struggled with their work but also what they feel was a success. They are also required to consider future alterations they might make and rationalize why.

Aims:

- To help the children to understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation using a range of techniques.

- To allow the children the opportunity to analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems.

- To encourage the children to evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems.

- To help the children to become responsible, competent, confident and creative users of information and communication technology.

We enable each child to:

- Understand the fundamental language of computer science and develop their computational thinking.
- Understand the key features of how to stay safe online and how to ensure that all websites, apps and games are appropriate for them. This includes knowing what to do if they feel unsafe or are exposed to something that is inappropriate.
- Use coding skills to create a range of different programs, making sure that they can isolate any problems with their program and debug those issues.
- Improve their presentation skills, using a range of technology.
- Practice and improve their touch-typing skills.
- Be confident in navigating the Internet, and using search engines efficiently.

Development of the knowledge/facts

Computing is predominantly a skill-based subject, whereby the pupils will learn how to implement different skills both in the real & digital worlds, through the use of technology. A focused area in which the pupils gain knowledge is through their acquisition of language. As the pupils move through school, the subject-based language they gather will become more advanced, developing a greater range of vocabulary.

Development of Skills

The pupils will develop their skills in computer science through each year group in school, building on the previous knowledge & acquiring new knowledge. As the pupils go through school, the skills they develop will become more challenging and the language they are taught will become more advanced. For example, pupils in KS1 will be expected to understand a simple algorithm used in a real-life scenario; whereas pupils in Upper KS2 will be expected to use an algorithm to create an advanced quiz using programming skills, which include for example nested loops.

How it is taught

Computing in KS2 is taught as a discrete, one-hour session each week by the computing lead. Class teachers in KS2 will also use computer skills within their lessons, such as presentation and research skills, to develop & enhance the pupils understanding & skill set.

In KS1, the class teachers deliver computing lessons at different times throughout the year, wherever it best fits with their topics, as a cross-curricular link. The learning, in KS1 is planned to ensure that the NC coverage and expectations are met and that pupils are ready for KS2.

Assessment of the subject and how this is used

By the end of each computing topic, pupils will have completed a small project (for example, creating an online game through the use of coding and programming skills in year 5) and this will be assessed to track their understanding of that topic, as well as how well they apply it to their learning. They will also be asked to evaluate their own learning and what they could have improved and how. This is also taken into account when assessing their progress as self-evaluation is a vital part of the computing curriculum. This information is then used, alongside teacher judgement, to assess at what stage pupils are in their learning ('below', 'within', or 'exceeding' expectations), and therefore what they will need to focus on when they next approach the computing topic. This information & assessment is shared with all teachers on a half-termly bases.

Links to other areas of the curriculum

Computing skills are used to enhance a number of topics. Through the school, there are clear links to many subjects including; Geography (the gulf in technological advances in different countries), Physics (the building of technology), History (the changes in technology over time), Art (Creating art using technology) and Maths (the use of math knowledge to create algorithms and problem solve).

References

https://insightbeforeaction.com/how-many-uk-jobs-now-require-digital-skills/
(Insite for Action, October 30th 2023, written by Andy Woolley)
https://assets.publishing.service.gov.uk/media/5cfe713fed915d097daca4b5/No_Longer_Optional_Employer_Demand_for_Digital_Skills.pdf (Department for Digital, Culture, Media and Sport, 'No Longer Optional: Employer Demand for Digital Skills', June 2019)