Computing Curriculum Rationale

At St Thomas of Canterbury, our intention is to engage our children in a high quality, rich computing environment to prepare them for the ever-changing technological world around them. Through our curriculum we aim to develop responsible users of technology who can work confidently and independently with any challenge that may face them.

INTENT

Alignment to National Curriculum

The St Thomas of Canterbury computing curriculum takes the best from the NCCE and Purple Mash schemes of work to enable children to become computational thinkers when programming and creative users of information technology. We also aim to ensure that all pupils become digitally literate and can use technology safely, respectfully and responsibly. Content is taught under the headings of Computer Systems and Networks, Algorithms and programming, Digital media, Data handling, Searching/selecting information, and E-safety and follows the national curriculum as the basis for its content. Online safety is embedded within the computing and PSHE curriculum.

End Points

By the time pupils move on to secondary school, they will understand how to design and write programs, including using sequence, selection and repetition and working logically to understand and debug; work with various systems, including physical systems; understand computer networks including the Internet, and understand how search engines operate; have used a variety of programs to create digital media including video, audio and office applications; and have a strong understanding of how to use technology safely and responsibly.

Sequencing

Our computing curriculum has been carefully sequenced so that children build knowledge year-on-year in the core themes of Computer Science (Computer Systems and Networks & Algorithms and programming), Information Technology (Digital media & Data handling) and Digital Literacy (Searching/selecting information & E-safety). Opportunities to consolidate knowledge and understanding are present across lessons and from year to year and the progression map shows the understanding and vocabulary that children should have in each area by the end of each unit and year.

Addressing Social Disadvantage

The government report "No longer optional: employer demand for digital skills" states that, "Overall, roles requiring digital skills pay 29% (£8,300) over those roles that do not (£37,000 vs £28,700)." The computing curriculum is designed to ensure that all pupils have the opportunity to succeed. The aim is to deliver the curriculum to all pupils and to support individuals in keeping up with the pace of the scheme of work across the school.

Local Context

There is a current and future demand for digital skills with over 21,000 people being employed in digital industries across Sheffield in 2017. To support with building computing skills, we have access to two class sets of iPads and are in the process of installing a computer suite which will allow access to a wide range of programs.

IMPLEMENTATION

Pedagogical Approaches

The knowledge required in computing takes place through a range of approaches and our learners experience this knowledge through active learning tasks. Some activities begin with tutorials that provide instructions. Immediate feedback is given to provide positive reinforcement for learners as they achieve each level. Learners working through the levels of the activity are building their knowledge through experience. Another approach used is the PRIMM model. In programming, the children may be asked to predict, run or investigate teachers code before then being asked to modify a program and then onto designing and making their own.

Teachers' Expert Knowledge

As with all subjects, teachers are expected to demonstrate good subject and curriculum knowledge and are supported with regular CPD and clarity in the curriculum map as to learning outcomes from previous year groups. Teachers are provided with an overview of the required skills and knowledge being taught rather than the technology being used. Learning materials from NCCE and Purple Mash provide support with background knowledge.

Promoting Discussion and Understanding

To develop understanding in computing, many concepts are first taught through role play or unplugged activities (away from computer). This leads to conversations and discussions about how computers actually work or what the code is actually doing in the program. Through these type of activities, key vocabulary, and core knowledge, is mastered. Table groups are often used to promote discussion and table and paired work allows children to feed back to each other about their programs and designs.

Knowing More and Remembering More

Knowledge and skills build from year to year and it is important that pupils can remember and use knowledge and skills from previous learning. Effective questioning by the teacher is key to allow pupils to practise new knowledge and to help them make links between new material and prior learning (Rosenshine). Opportunities for retrieval practice are included to ensure knowledge is transferred into long-term memory.

Teacher Assessment

Formative assessment is used to implement the computing curriculum. This is achieved through observations, quizzes, self and peer assessments using success criteria to assess a final project. The teacher plans opportunities in the lesson to check that pupils understand, can do the task, can problem solve, can predict and can explain using the key vocabulary.

IMPACT

Approach to Assessment

Throughout and at the end of a lesson, children are asked to evaluate and recognise their own success against the learning outcome. After the unit, children carry out an accurate self and/or peer assessment on the work they have produced against the set criteria. The teacher tracks whether children are working towards, meeting or exceeding what is thought to be the national standard for that unit of work.

Performance Data

Data is not published nationally for computing. The school tracks foundation subjects very broadly to ensure that pupils are working within the curriculum expectations for their year group. This is reported to parents within the end of year report.

Pupils' Work

Pupils' work is saved in a variety of ways depending on the activity. Work is uploaded to Google Classroom and to Purple Mash, and some activities are paper-based. This not only provides the teacher with evidence for assessment, but also gives the teacher the opportunity to use children's work to demonstrate, model or modify, to develop understanding. Children also save work on platforms like Scratch. Work is monitored by the subject leader to ensure there is sequence, progression and greater independence by higher year groups.

Talking to Pupils

The computing curriculum leader talks to pupils in all year groups as part of the monitoring cycle to gauge their attitudes towards the computing curriculum, the knowledge, skills and understanding they are retaining, and the wider opportunities that they have been able to experience.

Links / References

Digital Skills: https://www.gov.uk/government/publications/current-and-future-demand-for-digital-skills-in-the-workplace
PRIMM Model: https://blogs.kcl.ac.uk/cser/2017/09/01/primm-a-structured-approach-to-teaching-programming/
Sheffield Picture: https://www.sheffield.ac.uk/news/nr/creative-digital-report-tech-city-1.705754
Rosenshine's Principles in Action – Tom Sherrington