Principles of Teaching and Learning

At The Coombes CE Primary School, we ensure that our curriculum design places rich subject-specific knowledge at the heart of all learning. When planning our curriculum, we recognise that there are different types of knowledge that contribute to effective learning and the distribution and intersection of these differs between each subject.

The pedagogical subject-specific approach to teaching and learning considers each knowledge type and is therefore essential in both planning and delivery, ensuring children make connections with prior learning within and across subjects, creating deeper learning experiences. Using this approach to our curriculum ensures children at The Coombes are able to confidently recall, use and apply knowledge across all subject areas, whilst also developing a love of learning and to grow and flourish in all stages of their education in our school.

The three types of knowledge

Substantive Knowledge

Established facts, principles, laws, descriptions, concepts etc. of a subject. In other words, this could be referred to as the facts and main knowledge that pupils might learn
(e.g. knowing the components of a computer/laptop, knowing what programming is, or knowing how to log in to a device

Disciplinary Knowledge

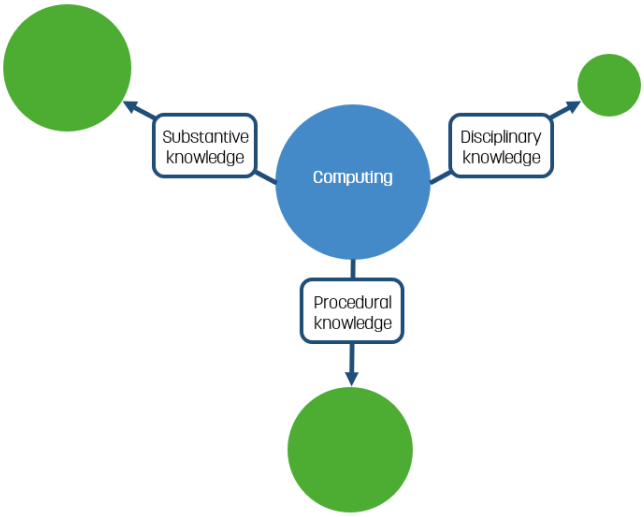
Methods that establish substantive knowledge (i.e. how a programmer must use debugging and test out many times to create establish a working code and know that this works and is effective).This can help provide rationale for the way the subject is delivered. A pupil's capacity to learn and use disciplinary knowledge is dependent on the depth and security of their substantive knowledge

Procedural Knowledge

The skills or techniques needed to complete a procedure or task. It is the 'know how' of the processes required in a subject (e.g. being able to actually use a keyboard or programme using Scratch). Procedural knowledge is often incremental and requires regular practice.

Knowledge distribution

We recognise that different subjects have different weightings of substantive, disciplinary and procedural knowledge. This infographic highlights what we consider to be the ratio of each form of knowledge within this subject:



Our Computing Vision

Computing at The Coombes Church of England Primary School focuses on the three pillars, as outlined in the Ofsted research review:

- Computer science
  - Including knowledge of computers and computation, such as data, system architecture, algorithms and programming.
- Information technology
  - Including a focus on how computers are used in different sectors and the methods used to create 'digital artefacts' (digital objects created by humans) such as presentations, spreadsheets and videos.
- Digital literacy
  - Including the skills and knowledge required to be an effective, safe and discerning user of a range of computer systems.

Our aim is to teach our pupils to understand and use relevant technology safely and effectively, be brave and resilient when using (and, inevitably, debugging or adapting) technology, and understand the risks of technology (including online) as well as benefitting from it. This includes a strong emphasis on online safety, digital footprints and social media, gaming and online bullying.

The philosopher John Dewey said "if we teach today's students as we taught yesterday's, we rob them of tomorrow". With technology moving faster than schools can teach it, it is likely that this could be a reality for all schools. Therefore, we work to ensure our pupils have transferable skills (including basic laptop navigation, presentation skills and programming) to take with them into the future of technology, as well as enthusiasm and resilience to tackle new technology and challenges with positivity and to 'find the joy in demanding work'. Our vision is for pupils to leave our school inspired, knowledgeable, skilled and equipped for the new opportunities that will arise in our modern society

Curriculum structure

Units are centred around the three pillars and accessed via the Kapow Computing scheme. Units are typically 5 lessons long, allowing for an additional Online Safety lesson (or more) per half term, and regular teaching about online safety to be built in. There are 5 Computing units per year from Year 1 to Year 6 (in EYFS there are 4 units covered). This allows core skills to be regularly revisited and helps pupils retain and build upon prior knowledge. We use retrieval practice, knowledge organisers and other methods to ensure that pupils are prepared for their subject and focus on the right objectives during lessons. Subject-specific vocabulary is taught and we aim to deepen understanding through questioning.

Our Unit Maps provide the overview for each subject's unit of lessons for a topic. This includes the following:

Knowledge taught / prior knowledge
Knowing what core substantive knowledge to teach, as well as prior learning which we can build on, is essential to ensuring clear progression and depth of understanding in a subject.

Each subject has concepts which run through every unit and year group. These concepts allow consistency of focus and progression within each concept from unit to unit and year to year. Our key concepts are as follows:

Curriculum Vision: Computing

Online Safety	Computing Systems and Networks	Programming	Creating Media	Data Handling

Early Years Foundation Stage

In Early Years Foundation Stage (EYFS), our Reception pupils learn the basics of Computing through a series of units which support them to follow, give and debug instructions, log in to devices and use a mouse, engage in basic programming (using a Bee-Bot), begin to develop an understanding of data handling, and begin to develop a curiosity and enjoyment of technology and challenge

Key Stage 1

In Key Stage 1 (KS1), pupils build on the basic skills learned in EYFS and start to use those skills (such as mouse and navigating a device skills) to access more challenging topics. Pupils will grow their understanding of computers and algorithms, data handling and recording, developing and testing, programming and creating media. They will also engage in word processing and basic programming (via ScratchJr). Finally, pupils will all have clearly-defined units around online safety.

Key Stage 2

In Key Stage 2 (KS2), pupils build on the skills they have developed in KS1 to enable them to extend their knowledge and skills of the topics covered in KS1. In addition to these areas, pupils also learn about other computer systems (such as email), learn more about how computers work, explore website design and search engines, manipulate and use media in a range of ways (e.g. animation) and experience more complex coding. There is also an emphasis on online safety as pupils are given (outside of school) more freedom online

We plan and sequence units based on the National Curriculum objectives. Our units are not taught chronologically as there are key concepts and themes that lend themselves more suitably to older pupils as they are more complex.

Milestones and assessment opportunities

Our milestone objectives and assessment opportunities ensure that there is clear progression and we know how to assess those types of knowledge and outcomes within a unit.

Vocabulary

We have developed a list of Tier 2 and Tier 3 vocabulary to cover within a unit. This vocabulary also links into our knowledge organisers, so that the pupils have access to this essential vocabulary.

Cross curricular links

It is important to understand how subjects can work with each other, so there are specific links to other subjects outlined in the Unit Maps.

Impact

We measure the effectiveness of our curriculum in the following ways:

- Pupil data tracking (PITA grids and Target Tracker)
- Book scrutiny
- Monitoring of lessons and planning (including from governors and external validation e.g. TKAT or WBC)

- Pupil conferencing.

Supplementary support

We utilise the following support within our curriculum for this subject:

- Computing.org subscription
- TKAT subject network meetings
- Local experts and support networks