



Sacred Heart High School

Key Stage 3 Curriculum

COMPUTING

INTENT *(the unique contribution the subject makes to general education)*

The National Curriculum Programme of Study for Computing at Key Stage 3 states that 'A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world.' The department's Vision and Policies set out its core intent and objectives, which are in support both of the Programme of Study and the school ethos. These four strands (shown on the right) are detailed later below.

1. **Developing critical enquiry**
2. **Transferable understanding and skills**
3. **Learning through experience**
4. **Communities of practice**

In relationship to the Catholic values of Sacred Heart High School, the department vision notes that the development of modern Computing clearly postdates 'traditional values' and is a subject whose value is generally understood in terms of preparing students for modern life and the workplace, not the inculcation of lifetime values. Yet Computing presents not only ethical opportunities for considered reflection; the pace of change it involves forces us to confront a number of serious ethical, moral, social and environmental problems and opportunities for young people.

All girls at Sacred Heart will therefore study a challenging curriculum in which they will be taught to:

- See digital literacy as an area where they can be creative, and understand genuinely the principles behind how a computer works, not just learn basic skills which may fall out of date;
- Understand that information technology involves working with others on complex projects, communicating clearly, developing empathy and using technology wisely;
- Appreciate that programming is an important and potentially rewarding area of the subject but not an 'elite' skill. Rather, it is valued across a range of workplaces and industries.

The aims and purposes of the Key Stage 3 curriculum are as follows:

Developing critical enquiry

Critical enquiry involves both the skills of analysis and of synthesis which work together to develop students' thinking skills and understanding. The topics of metacognition and memory retrieval are major concerns of current curriculum design. In fact, interestingly the model of neuroscience they use owes much in its driving concepts and metaphors to Computing. If they are central concepts in an effective curriculum then they raise valuable questions about teaching methods. In summary, we aim for students to take away knowledge and understanding which will inform the choices they make in their future lives for the safety of themselves and those around them.

Genuine and transferable understanding and skills

The acquisition of a wide range of IT skills is an example of 'powerful knowledge' which is of use to young people throughout their lives, in the workplace and at home. Yet it is not the same as a series of disconnected learning aims. The topic of 'powerful knowledge', allied to the concept of cultural capital pursued in the new Ofsted framework, raises interesting questions about the privileging of socially constructed models of learning and their interaction with social advantage and injustice. Thus a Computing curriculum mindful of powerful knowledge needs to constantly develop equity and social justice in its provision so it may not exclude some. This will be achieved through teaching methods and a consideration of the principles of what we want students to learn. How we aim this to be operationalised in different year groups is detailed below.

Learning through experience

This strand of our teaching involves students discovering how to use computers effectively through trial and error, teacher guidance, self-reflection and the use of online resources. It also includes "offline" learning such as the importance of literacy in students' development. Learning through experience includes what is often called media studies: critical reflection on the impact of tools and media on our ways of working and being. Through experience students will be led to understand their actions on technology and its effects on others and see "behind the scenes" of technology they may take for granted. A challenging aspect of this can be students' high expectations that technology will 'just work', when they encounter the difficulties of making things for themselves.

Communities of practice

Lave and Wenger in their well-known study of situated learning note the importance of 'communities of practice' being established through which 'legitimate peripheral participation' is secured (Lave, 1991). This means that as students' skills develop, they work in communities of practice through which their learning is modelled and reflected upon (this is not just the same thing as team work, it can involve individual work). This leads to legitimacy being conferred on their work by the teacher, and at older years by peers themselves, so that students increasingly come to see themselves as 'legitimate peripheral participants' in the world of learning and the Computing industry (peripheral because they are not actually working in industry yet). This involves a responsibility for the teacher to be a role model; for students to be active, creative and reflective and to take responsibility; and for work and assessment to be complex and imaginative in nature. It is also the basis for whole school initiatives such as e-safety ambassadors.

THEMES (KNOWLEDGE & UNDERSTANDING)

From the department 'Information for Parents', available on request: Girls are taught twice per fortnight and will be taught a range of topics including:

- Staying safe online, including cyber bullying, hacking, nude images and the law
- Ethics and the law in relation to information technology
- Powerfully using Microsoft Office including Powerpoint, Excel and Word; and other packages
- Programming skills detailed to the right
- Internet research and presentation skills, including video and mixed media
- The effects of the Internet and modern technology on contemporary culture
- Setting up 'businesses' and learning about the use of IT in industry

Foci in the teaching on e-safety (as well as statutory requirements) are:

- The impact of modern technology on friendships and personal responsibility. The reality of data storage and the 'cloud'.

At all years in Key Stage 3 our curriculum follows termly themes:

AUTUMN TERM 'Living sensibly'

SPRING TERM 'Thinking critically'

SUMMER TERM 'Working creatively'

SKILLS

The National Curriculum states that there are three aspects to Computing provision, and at Sacred Heart these are envisaged in ways which support the school ethos and the Goals of Learning.

- 1. Digital literacy.** This encompasses "functional skills" such as the use of the computer and basic office and software applications. It is important for all girls to be able to access this level of computing skill. It also includes significant teaching on e-safety which is detailed in this plan also.
- 2. Information technology.** This builds on digital literacy skills to combine existing technologies to create something new, such as a business project. This area of the curriculum can particularly support group work, pair work and creative independent project tasks.
- 3. Computer science.** This suggests studying the computer itself, the way it is designed and how programming in particular can be used to create new software (rather than using existing packages). The department aims to make programming accessible and interesting to the girls.

We do vary and update our KS3 programming offer regularly; it currently includes:

- Website design through HTML, CSS, some JavaScript
- Interactive art through Python Turtle

Spreadsheet formulae and basic macro design

YEAR 7

Michaelmas term

E-safety introductory unit

Reflections on social equality and diversity in Computing historically and now

Lent term

Trinity term

YEAR 8

Michaelmas term

Website using HTML, CSS, JavaScript

Python Turtle artworks

Reflections on social equality and diversity in Computing historically and now

Lent term

'Apps for Good' group app design activity

Project work - setting up a 'business'

Trinity term

How mobile phones work (hardware and software)

Designing a mobile phone project

YEAR 9

Michaelmas term

Spreadsheet functional skills

Evaluating social media influencers

Reflections on social equality and diversity in Computing historically and now

Lent term

Python artworks

Artificial intelligence and algorithms

Trinity term

Cyber-crime, the dark web, faith online

Functional skills assessment

ASSESSMENT

- IPM1 is examination based. We check for pupil understanding of the concepts and ideas taught as well as factual detail. There are literacy-focussed questions.
- IPM2 is half examination, half project based. The projects assess the development of functional skills and the examination asks pupils to synthesise knowledge.
- IPM3 is fully or mostly examination based. This includes summative assessment and whilst based on Trinity term work, aims also to integrate the year's work.

STRETCH & CHALLENGE

- Stretch and challenge questions may invite pupils to research unfamiliar topics, use new software packages and reflect on their own understanding critically.
- Pupils particularly interested in programming have access to an Open University / Cisco accredited online course which we manage and can assist with.
- They are also supported to use online resources and 'help sheets' so they can become confident interrogators and users of the resources widely available.

ENRICHMENT OPPORTUNITIES

- We review each year our enrichment offer and have recently offered clubs such as web design, game design and fun computing activities.