Curriculum Progression Maps

Computing

Why is the study of Computing important?

Our aim in Computing is two-fold: to inspire students – as pioneers of the future; and to nurture a love of our subject. As computer programs pervade every aspect of our lives, our society needs individuals that are digitally literate, as well as being passionate to develop computing in every type of industry should they wish to pursue computing further. In practice, this means that students need to see the wider picture and to relate their learning to the real world and possible career paths. They need to become digitally literate, and digitally resilient. We will achieve this by teaching them to understand and apply the fundamental principles and concepts of Computer Science. They will acquire this knowledge by learning key facts and words, by analysing problems in computational terms, and through repeated practical experience of writing computer programs in order to solve problems. In addition, pupils will be fully aware of E-safety and be confident creators of Digital Multimedia. Students will thus learn to evaluate and apply information technology (including unfamiliar technologies) and will become competent and creative users of it – in both home and work contexts.

What are the Big Ideas in Computing?

- 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
- understand the impacts of digital technology to the individual and to wider society and apply mathematical skills relevant to computer science.

What will you know and understand from your study of Computing?

- declarative knowledge ('knowing that') and procedural knowledge ('knowing how') are identified, sequenced and connected in the computing curriculum
- students learn important programming knowledge to enable them to become skilful programmers.
- programming languages are chosen to meet labour market requirements
- development of computational thinking and problem-solving is underpinned by domain-specific knowledge that is identified and sequenced in the computing curriculum
- to teach students how to create digital artefacts is underpinned by specified declarative and procedural knowledge
- developed knowledge of digital literacy
- knowledge related to e-safety is carefully sequenced to the world around students
- component declarative and procedural knowledge are identified and sequenced to enable students to be successful in learning complex ideas or processes

How does your study of Computing support your expertise in other subjects?

The Computing curriculum equips students to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. Information Technology ensures that students 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 as active, aware and informed participants in the digital world. We also aim for the students to leave their education here with the skill set to keep their knowledge up to date in the ever-changing digital technology landscape

How can you become an expert in Computing?

Code Club provides detailed resources to develop in-depth knowledge for students in lessons or as part of extra-curricular clubs www.codeclub.org.uk New Zealand-based Computer Science (CS) Unplugged produce an excellent collection of resources exploring computer science ideas for students to explore.

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http://csunplugged.org/ Computing at School (CAS) hosts a range of activities.

Naace (the ICT association) and CAS have developed joint activities to extend learning outside the

There are excellent resources available for teaching with MIT's Scratch programming toolkit, together with an online community, on the ScratchEd site: see http://scratched.media. mit.edu/ activities for learning safe, respectful and responsible use of technology are widely available as well as https://www.thinkuknow.co.uk/

What opportunities are there to experience Computing beyond the classroom?

We have links with GCHQ and through the yearly careers fair students get the opportunity to speak to employees and discover what roles relating to computer science are available and progression routes.

We offer visits to the Scarborough Science and Engineering Week where students to experience STEM and meet a range of employers from the local area.

How will you develop your character through your Spiritual, Moral, Social & Cultural experiences in Computing?

Computing is blessed, as a subject, to have such a wide and rich range of topics, texts and themes as part of the curriculum offer.

All of our student's study Computing at Key Stage 3 and experience materials that can be a powerful tool for exploring social, moral, cultural and spiritual development and well-being.

Spiritual
Students are continually reflecting on their own lives and the lives of others as they look at various Computing case studies. Students debate and formulate their own set of values and beliefs through case studies as they share their own experiences.
Computing provides opportunities for reflection of awe and wonder about the achievements in Computing today and the possibilities for the future. Computing lets students have the opportunity to reflect on how computers can sometimes perform better in certain activities than people. To promote students' spiritual development, their sense of self and their will to achieve, the computing department continually takes the opportunity to praise students for their contribution in lessons.

Moral
Through real life case studies, students consider issues surrounding the misuse and access rights to personal data. The use of case studies in computing encourages students to draw conclusions through evidence rather than their preconceptions whilst allowing the students the time to reflect on the origins of their own personal perceptions of a topic. Students consider the effects of social networking and the consequences of cyber bullying; they also consider the legal aspects of Computing including the Data Protection Act, Computer Misuse Act and Copyright legislation. They consider the implications of file sharing and downloading illegally and the penalties for engaging in this type of activity. Students also consider the moral aspects of developments in technology including the use of CCTV cameras, Speed Cameras and Loyalty Cards to balance up people's rights and responsibilities. Computing helps students to explore aspects of real and imaginary situations and enables them to reflect on the possible consequences of different actions and situations. It can raise issues such as whether it is morally right to have computer games whose aim is killing and violence, and whether it is fair that some people in this country and in other countries cannot use the internet.

Social
As part of the computing curriculum students are taught to think and produce work that reflects the needs of diverse audiences within our community and the wider community.
As students develop their skills in a range of software, they are challenged to work in groups to find solutions whilst developing respect for the ideas and opinions of others in their team. This is

particularly prevalent in the design phase of tasks given. In addition, students are encouraged to develop their team working skills through collaborative work and research. The students also explore the concept of teams and the roles that individuals have to play. Computing can also help all students to express themselves clearly and to communicate. As students' progress through their learning, they will consider more complex social needs and are encouraged to research and work collaboratively to find appropriate solutions to issues that may affect particular groups within society.

Cultural

Computational thinking encourages students to develop and explore their problem-solving skills. Computing Empowers students to apply their IT and computing skills and to gain knowledge of how programming links between subjects for instance maths.

Students explore how developments in technology have changed our culture, particularly the rise in social networking sites and the ability to communicate instantly across National and International borders. Computing involves the breaking through of linguistic and cultural barriers. It is possible to e-mail or chat across the world and to word process in the mother tongue.

Whilst studying various aspects of computing students are asked to reflect on how different cultures are portrayed on the internet and why or who is portraying them in this way. Students are also challenged to think about how differing cultures access and use the internet and what implications this has on the individual and the culture.

Key Assessment Objectives

1. Develop problem-solving skills: Think logically, computationally, and creatively to solve problems. Identify and analyse a problem, design a solution algorithm as a systematic way of processing the necessary information to produce the required output, and implement the solution as a computer program.
2. Become proficient in programming:
3. Attain an in-depth knowledge in computing systems
4. Understand the fundamental principles of computing
5. Strengthen students' ability to communicate effectively using digital skills. Develop an awareness of ethical, cultural and social impacts related to the use of computers.
6. Gain a broad exposure to topics in computing

How will you be assessed in Computing?

Year 7 will have an initial Baseline test to ascertain prior knowledge from key stage 1 and 2. During years 7 and 8 students will have an assessment after every topic to measure progress in lessons.

In years 9, 10 and 11 students undertake formal assessment every half term during lesson time.

In year 10 they have trial examination in the summer term.

In year 11 have trial exams in the spring term.

How can the study of Computing support students beyond school?

Computing provides a strong foundation for any job or profession that involves the use of IT.

Communication

- Technical writing
- Online Copyright
- Information Scientist
- Helpdesk/User support

Consultancy

- IT Consultant
- Business Analyst
- Systems Analyst
- Project Manager

IT Research

Curriculum Progression Maps

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- Artificial Intelligence
- Computer Security
- Defence Industry
- Patent Solicitor

Programming

- Software Engineer
- App/Game Developer
- Software Developer
- Systems Engineer

Digital Marketing

- Account Manager
- Business Analyst
- Systems Analyst
- Web Developer

The Six Principles of Nurture

Language is a vital form of education

Whole school focus on vocab in Computing we teach topic specific keywords at the start of a new topic.

The classroom offers a safe base

In the Computing department we have high level of expectations with regards to behaviour and engagement in lessons. We follow the Scalby school behaviour for learning system (outline d on P8 of student planner), have a recognised Matrix and seek support from Active Patrol SLT. Pupils feel safe in the predictability of whole school standards being upheld by all staff across the department. We expect all students to be the best they can be.

Children's learning is understood developmentally

Teachers have completed SEN Provision Maps for each class that they teach in the department. This is saved on Pedagogy platform for all teachers in the department to access. Links to SEN register, My Profiles. Examples of differentiation are using screen filters, enlarge worksheets if needed, coloured paper, writing frames for exam questions, allow students to type answers rather than write.

The importance of nurture for the development of wellbeing

Year 7 Digital Literacy and Year 8 E-safety

All behaviour is communication

As part of Scalby School behaviour policy C3's and C4's are recorded. This information is monitored and followed up via the Pastoral Protocol. In the classroom teaching staff and assistant teachers are aware of the wellbeing of students. Teachers understand that behaviour can be an indicator that a student is in need of additional support. Behaviours which are a cause for concern are raised with Pastoral or SEND teams so the correct intervention and support can be put in place. These include learning concerns which are raised as an SEN short note which trigger investigation into the need for exam access arrangements.

The importance of transition in children's lives

Involved in year 6 transition day, transition to KS4 from KS3 through transitional schemes of learning, support post 16 with careers awareness within the structure of lessons in all curriculum areas.