



## Computing Curriculum Statement

### King's Academy Binfield and King's Academy Oakwood

This document sets out the computing curriculum that we have selected as most appropriate for our students that will support them to achieve our vision and aims; 'dare to be remarkable' and 'opportunity and success on a global stage'.

#### **Intent**

At King's Academy Binfield and King's Academy Oakwood we believe that it is imperative that our students develop not just the digital skills and how technology works but to understand the knowledge and understanding of the impact of digital technologies. Our students need to be digital citizens and our curriculum aims to prepare them for life in digital Britain and take advantage of opportunities available now and that will be in the future.

Being digitally literate enables students to engage positively within the modern and future workplace, while Computer Science enables students to take an active part in the design, development and creation of new technologies to be used in the world in which they live. Computing is key to ensure that our students are able to use, and express themselves and develop their ideas through information and communication technology.

Computing is a key subject in understanding the way the world is rapidly changing, and at King's Academy Binfield and King's Academy Oakwood we want students to enjoy Computing and to have the curiosity to experience the power of Computer Science with clear understanding, from 3 - 16. It is a discipline that is rewarding and challenging.

As an academy we will develop a growth mindset and promote teaching through the fact that Computing is for all and brings both educational and social impacts. Students will spend time applying new knowledge in multiple ways. We use trial and error and allow students to learn from mistakes, by evaluating and improving work, as a key part of learning.

Using the national curriculum as our minimum in each key stage, our curriculum will be broad, ambitious and relevant for the students. We aim for all pupils to:

- 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.

Consequently, we have designed a curriculum where students experience a broad range of skills useful in a range of disciplines and will be creative when solving complex, challenging problems. Students must enquire and evaluate algorithms to justify their effectiveness; awareness about the information they share personally; investigate and discuss the use of information within an organisation or country; and core digital IT skills. Students will also discuss the moral and ethical impact of technology; environmental issues; the role of emerging technologies and look at its importance in today's society.

The curriculum will be enhanced through co-curricular opportunities from visits and visitors, clubs and enrichment opportunities. Extra-curricular opportunities will allow students to be more creative and innovative, using the skills with open-ended tasks challenging them to think about problems based within their communities.

## **Implementation**

We will never under-estimate the capabilities of our students and we aim to enable all students regardless of backgrounds and needs, and therefore we will be ambitious with our teaching for deeper understanding. Teachers will reinforce an expectation that all students are capable of achieving high standards.

Lessons are structured around theory and practical sessions. Centralised lesson planning is key and provides an equitable approach and diet for our students. It also eliminates unnecessary workload for teachers and priority can be given to ensuring the adaptations are adequate to their groups. It ensures the scheme of work will be of a high standard as it will be collaboratively planned and discussed.

The curriculum is innovative, featuring digital resources and opportunities to build practical, thinking and digital etiquette skills. The curriculum ensures that a breadth of resources are used. Throughout all key stages the students are exposed to the importance of communicating safely and respectfully online, and the need for keeping personal information private; teaching them to know what to do when concerned about content or being contacted and to become responsible users of technologies and online services.

## **EYFS**

In EYFS, students' computing skills are embedded throughout the EYFS curriculum and specifically within the 'Understanding the World' ELG where students explore how things work and the ELG of 'Expressive Arts and Design' with students encouraged to safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. There are many other opportunities for learning the foundations of computing within EYFS and these are specifically planned for within a variety of topics and themes as well as allowing students free choice to select technology to support their own learning. By the end of their time in EYFS, students will have had the opportunity to use a range of ICT including ipads, bee-bots, chromebook and apps.

## **KS1 and KS2**

In KS1 and KS2 computing is taught discreetly but computing skills are also embedded within other areas of the curriculum. Lessons are planned so that students are exposed to a variety of teaching and learning styles as well as having the opportunity to use a range of technology/equipment. Ipads, Chromebooks and Bee-Bots, amongst other technology, are used within lessons to support learning.

At the end of KS1 students will have had the opportunity to:

- Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- Create and debug simple programs
- Use logical reasoning to predict the behaviour of simple programs
- Use technology purposefully to create, organise, store, manipulate and retrieve digital content

- Recognise common uses of information technology beyond school
- Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

At the end of KS2 students will have had the opportunity to:

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration
- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Many key apps and software such as: Purple Mash, Scratch Jr, Book Creator, etc support the teaching of computing within the primary phase.

### **KS3 & KS4**

Students must understand the theoretical knowledge in order to appreciate the practical aspects of the course. In our lessons you will see students attempting the same challenging content but being provided with appropriate support and opportunities for further extension or open-ended activities.

At KS3 students follow a computing, IT and digital literacy programme taught throughout the key stage. Students will have the opportunity to:

- Understand the fundamental principles and concepts of Computer Science
- Apply key algorithms and data representation and mathematical skills through practical and theoretical work
- Understand the key components that make up digital systems and how they communicate
- Understand the impacts of digital technology to the individual and society, ethical changes and cultural impacts
- Equip learners and provide opportunities to develop in context, desirable, transferable skills in areas such as research, planning and evaluation
- Use a range of programming design techniques such as flowcharts, and visualisation diagrams
- Develop key problem solving skills of abstraction, decomposition and algorithmic thinking
- Develop key skills and practical experience in script based programming languages and be able to design, write and debug programs to solve non simplistic problems.
- To think creatively, innovatively, analytically, logically and critically when solving problems.
- Be able to make informed decisions on appropriate and efficient coding techniques such as sequence, selection, iteration and the use of functions
- To be able to design, program, evaluate and refine solutions to problems

At GCSE we follow the AQA specification for Computer Science and learning is embedded through the development of knowledge and skills over time and through overlapping concepts covered in KS3. There are regular 'long' and 'short answer' questions to support literacy. Students will build on their knowledge and understanding established throughout KS3.

Knowledge is regularly tested through short unit tests, with more formal assessments completed at the end of each term. Practical lessons are based around Python programming language but at KS4 students will develop those skills further whilst developing understanding of a language to manipulate databases.

Analysis of planned, regular moderation, work scrutiny and data drops for each year group enable accurate assessments to be made, progress to be tracked and next steps in learning to be planned for, including the adapting of teaching methods.

## **Impact**

All students will have the fundamental digital skills and become digital citizens to engage with the modern workforce and so are responsible, competent and creative users of information and communication technology. Students will understand the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation and can analyse problems in computation terms. Students will have practical experience of writing computer programs in order to solve such problems. They will be able to evaluate and apply information technology, including new or unfamiliar technologies.

For those who study Computer Science at KS4, we want our students to be able to go on to a number of differing destinations. Students will be able to progress to A-Level to provide the opportunity to carry on their studies at university or have the opportunity to complete apprenticeships with organisations and businesses. The destinations of our students will be carefully monitored to ensure the aspirational curriculum we have implemented enables strong post-16 progression to A Levels, college courses and post-18 progression to university or apprenticeships.

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