



King's Leadership Academy Bolton

Computing Curriculum Rationale

"The more I study, the more insatiable do I feel my genius for it to be." – Ada Lovelace

Overview

Technology is now in its maturity and almost every household has access to a device that can help with communication, finance, or general social necessities. The pandemic has brought forward the advancement of how we interact with people across the globe. Internet of Things (IoT) and Artificial Intelligence (AI) have evolved into an era where societies can benefit from fast, secure and trusting applications. At King's we want students to carve their own digital world and to develop their world into a space where imaginations can bring better opportunities for the community they serve. The course is not about building new devices but to understand the infrastructure that these devices work on.

We want students to:

- understand the underlying technology used by devices
- know how software applications are created on different platforms
- develop knowledge and skills various programming languages
- understand differences between centralised and decentralised systems
- provide solutions to problems in current systems used by major corporations like Google, Facebook, Amazon, Microsoft and Netflix.
- understand how DLTs and tokenisation is helping companies to solve mission critical problems
- understand how revenue can be generated through Digital Art and Digital Music

Often, you will hear pupils ask, 'how is computing going to help me if I become an Artist?'. At Kings we are teaching a general computing qualification, not just one for those who wish to pursue a career in Computer Science. Computing is not a subject taught solely for programming; computing can support all factors of our living. *'Computing is not about computers anymore. Its about living.'*
Nicholas Negroponte

Vocabulary Rich

The digital world comes with its own set of digital vocabulary and therefore requires students to become familiar with terms they can relate to whilst developing new technology. To support students in speaking the targeted computing language, each lesson will begin with a 'Key Word' which will be embedded within the lesson. Students will learn, then practise through end of lesson quizzes, show their understanding and then formally use them when answering questions.



Academic skills/Independent Learners

Solving problems is at the core of this subject. The foundations of the course rely on students to understand how problems are solved by humans and then to translate it into an 'algorithm' which something a computer can do, and then finally how to write the specific code independently. Prior learning of a computer system is pivotal to this and that's where practical elements of the course will support this. Students will experience how to build a computer, design a mobile app and build their own digital art graphics.

As a department we recognise that students often have barriers that make problem solving skills or independent learning more difficult, therefore adjustments are made in line with the school inclusion registers and advice from the school SENCo.

Intellectual Habits

The digital world is evolving with new technologies used to serve better purposes to living. From voting on governing elections, to track and tracing vaccines for the entire population, the need for fast, secure and trustable applications are becoming more and more important for a wide spread use. Despite this, our lives around digital devices remain oblivious to what really happens when our data is tampered with by third part proprietors , what can it lead to? Are we safe whilst we are exposed to the world of the internet? These are the mission critical intellectual habits that we want to embed in students at King's, so that they can remain confident, become strategic thinkers and most importantly, remain safe.

Diverse

There was once a cultural assumption where computers were known to be devices for boys. Mainly for reasons that it was perceived a gift for boys and you would have to spend 24/7 in front of a computer. To break this phenomena we start our course with a realisation of how the computer algorithm was invented by Ada Lovelace, who was a mathematician involved in building the first ever computer algorithm.

At King's all our students are given a digital device and all are given the opportunity to a wide spectrum of topics that will help them in reaching their career aspirations.

Inclusive

At King's, pupils with SEND have the same entitlement to be taught the curriculum content as any other pupil, but at times our curriculum may need adaptations to suit learners at all ability levels. We achieve this by implementing the inclusion register into lessons.



KING'S LEADERSHIP
ACADEMY BOLTON

We have an inclusive approach to computing where there is a balance between foundation level i.e. Computer Science, application (Information Technology) and digital literacy. So the curriculum breadth is spread by use of aspects of coding, software application, digital graphics, digital literacy, digital business and project development.

In line with transition planning often vulnerable children need support to allow safe transitions into adulthood. We want students to have a secure understanding of how to keep safe online, supporting their transition into adulthood.

Pedagogy

To ensure the above is taught effectively, the Computing curriculum at Kings:

- will be taught content that is of high quality, interactive and with teacher-led instructions.
- tackles the forgetting curve head on, by utilising effective practices that will allow students to recall information for in various situation.
- use supportive frameworks when planning lessons, such as PRIMM (Predict, Run, Investigate, Modify, Make) and Use-Modify-Create. These frameworks are based on research and ensure that differentiation can be built in at various stages of the lesson.
- uses demonstrations, stories, analogies, models, and practical work where appropriate to help pupils develop a greater understanding of how computers work and connect together to build platforms for devices to run on.
- support pupils in the acquisition of knowledge, through the use of key concepts, terms, and vocabulary, providing opportunities to build a shared and consistent understanding. E.g. Glossaries, concept maps, and displays, along with regular recall and revision.
- model processes or practices — everything from debugging code to binary number conversions — using techniques such as worked examples and live coding providing scaffolding that can be gradually taken away.
- use formative questioning to uncover misconceptions and adapt teaching to address them as they occur. Awareness of common misconceptions alongside discussion, concept mapping, peer instruction, or simple quizzes can help identify many areas of confusion.