### Tour – Valve to Chip (Computing in Context)

**What you will do:**
Students will see the museums key exhibits: World War 2 Codebreaking machines, The Bombe, Tunny and Colossus; First Generation Computers EDSAC & WITCH, 1960s and 1970s Elliott 803, 903 and mainframes; personal computers and retro games.

**Learning Objective:** Students to understand the development of computing in its historical and technological context.

**Curriculum Links: Computer Science and History**
- Cryptographic systems Caesar cipher and Vernam cipher
- Understand Boolean logic and uses in circuits and programming.
- Understand hardware and software components that make up computer system and how they communicate with one another and other system.

### Tour – Digital Revolution (How a computer works)

**What you will do:** Students will see: the world’s first semi programmable electronic computer; First generation computers, transistor computers, PCs and retro games. The tour will explore how computers work and how the technology has developed to become increasingly efficient and affordable.

**Learning Objective:** Student to understand how computers work.

**Curriculum Links: Computer Science**
- Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
- Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits

### Hands on Workshops – BBC Basic Programming 101

**What you will do:** Students will use genuine BBC Microcomputers from the 1980s to carry out some simple programming tasks including: printing a name, counting, a number guessing game, creating loops.

**Learning Objective:** Introduce students to the basics of programming if they are not familiar with programming languages. Most suitable for students who have not programmed with languages before.

**Curriculum Links: Computer Science**
Understand several key algorithms that reflect computational thinking for example, algorithms for sorting and searching]
### Hands on Workshops – BBC Basic Snake Game

**What you will do:** The students will code a 20-line program to create a game on the 1980s BBC Microcomputers.

**Learning Objective:** Students will learn how to create simple game using a computer language. This session is most suitable for students with some experience of programming using languages.

**Curriculum Link: Computer Science**

Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures design and develop modular programs that use procedures or functions.

### Hands on Workshops – BBC Basic Rocket Trajectory

**What you will do:** Students will learn how to create simple game using a computer language. This session is most suitable for students with some experience of programming using languages.

**Learning Objective:** Students will learn how to create simple program to map a rocket trajectory using a computer language. This session is most suitable for students with some experience of programming using languages.

**Curriculum Link: Computer Science**

- Use and evaluate computational abstraction that model the state and behaviour of real-world problems and physical systems.
- Use programming languages to solve computational problems.

### Hands on Workshops – Virtual Block H

**What you will do:** The students will use online web platform Cospaces to create and manipulate a virtual environment based on the museum as it might have looked during world war 2. Students will add to and manipulate the environment using code blocks to customise their space.

**Learning Objective:** Students to get an understand of how a virtual world is created. Creating and changing elements and using code.

**Curriculum Link: Computer Science**

Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users.

Create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability.
## Hands on Workshops – Turing Test

**What you will do:** Students use a networked chat bot to discover whether they are talking to a human or a machine in a real-life test for artificial intelligence as proposed by Alan Turing. Students create their own chat bot.

**Learning Objective:** Students explore how artificial intelligence has developed and how it is used in students’ everyday life.

**Curriculum Link: Computer Science**
- Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems

## Explore - Mission:STEM

**What you will do:** Each student get a booklet which challenges students to explore each gallery of the museum answering questions and solving puzzles. The mission is to reactivate George our security robot by recovering passwords which will unlock the identity of his creator Professor Positron the only person who can fix him.

**Learning Objective:** Understand and explore computer technologies have developed over the last 7 decades

**Curriculum Link: Computer Science and History**
This visit touches on a wide range of themes and issues in computer science and Maths. It looks at algorithms, coding, programming, using logical reasoning, understanding computer networks, exploring a range of software and programs