

KS3 Assessment – Year [8] Progress Grid

Subject: Computing

These are the objectives a student on each Pathway needs to achieve by the end of year 9, to ensure they are making expected progress:

| | Computer Science | Information Technology | Digital Literacy |
|--------------------------------|--|---|--|
| Exceptional performance | Students recall the role of an operating system in controlling program execution. They can describe how hardware is built out of increasingly complex logic circuits. Students describe the steps involved in training machines to perform tasks. Students can associate logical circuits with logical operators and expressions. Students analyse how search engines rank results when searches are made. Students can use variables as counters in iterative programs and use Boolean variables as flags. Students evaluate the success of a programming project. | Students can evaluate vector graphics. | Students can explain the implications of sharing program code. |
| Pathway 1 | Students can explain the difference between a general-purpose computing system and a purpose-built computing system. They recognise that all computing systems have similar architecture. They can analyse how hardware components work together in order to execute programs. Students will have a broad understanding of operating systems. Students associate the use of artificial intelligence and moral dilemmas. They describe how logical operators are used to form logical expressions. They use logic gates to construct simple logic circuits. Students can modify HTML tags to improve the appearance of webpages. Students will also be able to apply HTML tags to construct a webpage structure from a provided design. They can explain how search engines 'crawl' through the WWW and how they select and rank results. Students understand that machines need translators for executing programs. Students can call functions in a program and use the results. They can combine iteration and selection to control the flow of a program. They can use a block-based programming language to include selection. Students apply decomposition techniques to break down larger problems into smaller steps. Students establish user needs when completing a creative project. They reflect and react to user feedback. Students can provide examples of how different representations are appropriate for different tasks and how they are physically represented in digital devices. Students can measure the size or length of a sequence of bits as the number of binary digits that it contains. Students can convert between different units of representation size. | Students can combine multiple tools and techniques to create a vector graphic design. Students can explain what vector graphics are and provide examples of where using vector graphics would be appropriate. | Students discuss the issues of safety and network security from a technological point of view. |
| Pathway 2 | Students understand that a general-purpose computing system is a device for executing programs. They describe how hardware components work together in order to execute programs. Students recall that data and instructions are represented using binary digits. Students can identify examples of artificial intelligence and describe how machine learning differs from traditional programming. Students describe the NOT, AND, OR logical operators. Students can use HTML to structure static pages. Students create hyperlinks to allow users to navigate between multiple pages. Students know the difference between algorithms and programs. They can locate and correct common syntax errors. Students can walk through a sequence and sketch the state and output. Students can use selection to control the flow of a program. Students recognise that events can control the flow of a program. Students can use variables in an event-driven programming environment. Students can pass the variable into an object and use input in an event-driven programming environment. They can identify and fix errors and know when a problem needs to be broken down. Students recall that representations are used to store, communicate and process information and provide examples of how they are carried on physical media. They can explain what binary digits (bits) are in terms of familiar symbols such as digits or letters. They can describe how natural numbers are represented as sequences in binary digits and how characters are represented as sequences of binary digits. Students can convert a decimal number to a binary and vice versa. | Students can manipulate groups of objects and combine paths by applying operations. Students can draw and edit paths. | Students discuss the impact of networking technologies and services. |
| Pathway 3 | Students can recall that a program is a sequence of instructions. They can describe the function of some hardware components used in computing systems. Students can provide a broad definition of Artificial Intelligence and machine learning. Students can describe what HTML and CSS is and display images within a webpage. Students can describe what an algorithms and programs are. They can use an IDE to write and execute a Python program. Students can arrange program statements in a sequence. Students can use a block based programming language to create a sequence. Students are able to list examples of representations. They recall that binary digits (bits) are used to represent all information that is stored, transmitted and processed on a computer. | Students can draw basic shapes with different properties. Students can manipulate objects in a graphics package. They can convert objects to paths. | Students can use search engines safely and effectively. |