

Edexcel GCSE Computer Science Learning Journey (Years 10 & 11)

Year 10

Autumn Term

Working With Data — variables, constants, data types, arithmetic operators & debugging. Problem-solving tasks: My Pet, Split the Pizza.

Hardware & CPU Architecture — FDE cycle, buses, stored program concept. Selection & flowcharts; IF statements & Boolean logic.

Embedded Systems — RAM, ROM, optical, magnetic & solid-state storage.

Spring Term

Repetition — WHILE, FOR loops, counters, flags & random numbers.

Tasks: Guessing Game, Theme Park Ride, Fever Monitor.

Data Representation — binary, denary, hexadecimal, two's complement & binary shifts.

Bitmaps, Sound & Compression — pixels, colour depth, ADC, sample rate, lossy vs lossless.

1D Data Structures — lists/arrays, indexing, append/delete, iteration.

Summer Term

Operating Systems & Utility Software — file management, scheduling, memory allocation, compression, backup & defragmentation.

Subprograms — procedures, functions, parameters, global vs local variables, reusable subroutines.

Turtle Programming — coordinates, polygons, decomposition & abstraction.

Combining subprograms for complex graphics.

Autumn Term

Networks & Internet Technologies — LAN/WAN, routers, MAC & IP addressing, bandwidth, latency, Wi-Fi, Bluetooth, NFC, RFID. Packet switching, TCP/IP, HTTP/FTP/SMTP. Turtle programming; computational thinking — decomposition, abstraction & trace tables.

Strings & Validation — presence, length, range & format checks; exception handling.

Ethical, Legal, Cultural & Environmental Issues — Data Protection Act, Computer Misuse Act, copyright.

Spring Term

Programming Languages — high/low level, translators: compilers, interpreters, assemblers.

1D Structures & Searching — linear search, binary search, bubble sort & merge sort.

2D Data Structures — tables/records, searching rows, nested iteration.

Working With Files — reading, writing, appending, CSV processing, storing data in 2D lists.

Testing; Boolean logic & truth tables; **AI & Machine Learning; Cybersecurity** — malware, phishing, firewalls, encryption & IoT security.

Summer Term

Exam Preparation

Final exam practice and past paper technique.

Year 11



KING JAMES'S SCHOOL
KNARESBOROUGH