GCSE Computer Science Revision Topics (Paper 1)

Topic 1 – Computational Thinking

- **Decomposition & Abstraction**
  - recognising the purpose and benefits of each, and the use of subprograms
- **Algorithms**
  - Following and writing algorithms as code and flowcharts
  - Tracking variables and arrays/lists
  - Understanding arithmetic algorithms
  - Determining outputs from algorithms
  - Sorting and searching algorithms
- **Truth Tables**
  - Create truth tables using AND, OR, NOT

Topic 2 – Data

- **Binary**
  - Signed and unsigned integers, negative binary
  - Converting between binary, denary, and hexadecimal
  - Adding, multiplying and dividing binary numbers
- **Data Representation**
  - How computers store images, sound, text, and numbers
  - Factors affecting quality and file size of images and sounds
- **Data Storage & Compression**
  - Recognising file size units and conversion (e.g. bits to kibibytes)
  - Lossy and lossless compression requirements

Topic 3 – Computers

- **Hardware**
  - Understanding the von Neumann stored program concept
  - Secondary storage methods
  - Embedded systems
- **Software**
  - Purpose and functionality of operating systems
  - Function of utility software
  - Importance of developing robust software and identifying vulnerabilities
- **Programming Languages**
  - Characteristics and purpose of low and high-level languages
  - How interpreters and compilers differ

Topic 4 – Networks

- **Networks**
  - Understand WANs/LANs and why computers are connected to networks
  - Structure of the internet (IP addressing, routers)
  - Characteristics of wired and wireless connections
  - Calculating transfer speeds and download times
  - Understand a range of network protocols
  - 4-layer TCP-IP stack and how it handles data transmission
- **Network Security**
  - Identifying network vulnerabilities
  - Methods of protecting networks

Topic 5 – Issues and Impact

- **Environmental**
  - Understand environmental issues (energy use, manufacturing etc.)
- **Ethical & Legal**
  - Issues associated with the collection and use of personal data
  - Artificial intelligence & machine learning
  - Intellectual property protection such as copyright law and licensing.
- **Cybersecurity**
  - Threats to digital systems including malware, and how hackers exploit weaknesses
  - Methods of protecting systems against cyberattacks