Y9 syllabus / revision topic checklist (last updated Oct 2021)

Y9 topic 1 - Python #2

This extends the content covered in Python #1 (Y8) by adding:

- Condition controlled loops (While)
- Count controlled loops (For)
- String handling (converting to upper case, length, string slicing, etc.)
- Lists in Python (1d lists only)

Y9 topic 2 - Sound & video data

- Be able to discuss the benefits of multi-tracking when recording music including adding effects, rebalancing/re-mixing music, etc.
- Be able to define analogue and digital music, and the advantages/disadvantages of digitizing music
- Be able to explain the differences between the two main digital music formats: sampled music and MIDI
- Be able to describe how music is digitised and the purpose of DAC and ADC devices
- Be able to define and use digital music terms including sampling rates, frequency, amplitude and Hertz
- Be able to describe the differences and relative advantages of vector and raster graphics formats
- Be able to explain vector graphics, including understanding the terms ‘primitive’ & ‘Besier curve’ and listing some properties of objects that might be stored
- Be able to describe at least one technique for reducing the ‘pixelation’ effect that occurs when enlarging a raster graphic (e.g. anti-aliasing)
- Understand the difference between additive and subtractive primary colours and why both systems are used with computers
- Know of the CMYK system used for printing
- Understand what ‘alpha’ represents, and be able to list at least one common file format that supports transparency
- Understand that the size of a graphic file is linked to both the resolution of an image and its colour depth (i.e. how many colours something could be), and be able to explain why this is
- Be able to discuss file compression, including ‘lossy’ vs ‘lossless’ compression and the meaning of the term ‘redundant data’ in this context
- Be able to describe at least one compression technique (e.g. run length encoding)

Y9 topic 3 - Sorting/Searching Algorithms

- Understand what an algorithm is
- Understand the importance of accuracy in creating algorithms
- Know at least one algorithm for sorting
- Know at least one algorithm for searching

- Be able to describe advantages of sorting data in advance of searching
- Understand that different algorithms may be available for the same problem, and be able to identify reasons why one might be better than another in a given situation

Y9 topic 4 - Laws and Computing

Data protection act

- Be able to describe/define:
    - data commissioner
    - data subject
    - data controller
    - data user
    - personal data
- Be able to recognise the principles of the DPA and to list at least three of them

Computer Misuse Act

- Be able to describe the three levels of misuse

Copyright, Designs & Patents Act

- Be able to describe the reasons for this legislation.
- Be able to define plagiarism.

Regulation of Investigatory Powers Act

- Be able to briefly describe the purpose of the legislation, and what is covered by it.

Y9 topic 5 - SatNav case study

- Be able to describe how GPS works (triangulation may be used interchangeably with trilateration)
- Be able to define abstraction, give at least one example, and produce an abstracted diagram/map from real data as an aid to problem solving.
- Be able to follow Dijkstra's algorithm to solve computational problems (must be able to show evidence of working)
- Be able to explain the benefits of an algorithmic approach to problem solving in terms of:
    - A, Taking a complex problem, simplifying it and developing an algorithmic solution that can then be 'scaled up' again to solve complex problems
    - B, Being suited to processing by computers. Why are computers good at solving these sort of problems?

Y9 Topic 6 - databases

Understand what a database isl; key terms such as record, field, query, form, primary key

Understand the concept of ‘garbage in garbage out’ and the need for validation & verification

Be able to create flat-file databases.

Create/refine queries (using MS Access) with simple/complex criteria

Y9 Topic7 - group multi-media project

Group project to combine different types of digital media (graphics, video, sound, web development), aimed at a specific audience.