GCSE COMPUTER SCIENCE – LEARNING JOURNEY

Exam Paper 2

Exam Paper 1

Testing

Programming Challenge

2.4 – 2.5 Recap

Testing

Programming Challenge

2.1 – 2.3 Recap

Testing

Programming Challenge

1.4 – 1.6 Recap

Testing

2.5 Programming Languages & IDEs
What are the characteristics of languages; high and low-level. What is the purpose of translators, compilers, interpreters? What is Little Man Computer? Tools in an IDE; editors, error diagnostics, run-time environments & translators.

2.5 End of Unit Test

Programming Challenge

1.1 – 1.3 Recap

2.4 End of Unit Test

YEAR 11 GCSE

2.4 Boolean Logic
Creating simple logic diagrams and truth tables. Combine Boolean and logical operators to solve problems

2.3 End of Unit Test

2.3 Producing Robust Programs
Use string manipulation & file handling, open, read, write, close. Storing data in records. Using SQL to search for data. Using arrays to solve problems, 2D as well as sub programs & random number generation. Understanding why defensive programming is necessary. Using defensive designs (is that dangerous?) Then I have to test it all to make sure it works and debug if it doesn't, is that normal, boundary, invalid or erroneous? I will have to refine! Create code which is easy to maintain. Know the purpose of testing and types used for validation.

2.1 End of Unit Test

2.1 Algorithms
Using abstraction, decomposition and algorithmic thinking to define a problem. Create structure diagrams & flowcharts. How to efficiently search and sort data. Writing algorithms using Python. What are binary, bubble, merge, insertion sorts. How do I identify bugs and fixes? What are trace tables?

Programming Challenge

2.2 End of Unit Test

1.5 End of Unit Test

1.6 Ethical, Legal and Cultural Concerns
What are the issues created and addressed by technology and the impact on society including ethical, legal, cultural, environmental and privacy (I'm back to being Police again)? Legislation (now I'm a politician), Data Protection, computer misuse, copyright and licences

1.6 End of Unit Test

Programming Challenge

PAPER 2

2.2 Programming Fundamentals
Using variables, constants, operators, inputs/outputs (*and shake it all about*). Sequences, selection & iteration (*oh… Hokey Cokey Cokey*). Arithmetic, integers, Boolean (oh no not Math ☹). Characters & string manipulation (in an orchestra?), using appropriate data types and casting (acting?)

1.5 System Software
What are operating systems & interfaces? What is memory, peripheral, user and file management? What is utility software and why do they need encryption, defragmentation and file management & data compression?

YEAR 10 GCSE

Programming Challenge
Introduction to programming techniques & activities

1.3 End of Unit Test

1.4 Network Security
What forms of attack happen to computers and networks? What's malware, phishing (I fish), brute force attacks (dangerous) DoS (about?) Interception & theft (sounds dodgy). How to prevent attacks (who from?) What is an SQL injection, does it hurt? Firewalls, so I'm training to be a Firefighter too, who needs password encryption and security, sounds more like the Police!

1.3 Computer Network Connections & Protocols
What are LANS & WANs? What factors affect the performance of networks? What does client server and peer-to-peer mean? What hardware do you use on a LAN? What is the Internet really? What is a DNS, hosting, the cloud, web server and client mean? Routers & switches (sounds like a dance)? What are star and mesh network topologies? Wired or not to be wired, is that the question? What is Ethernet, WiFi and Bluetooth connections and how do they work? Why is cryptography and encryption. What are private and public keys and how do they work? What's an IP and MAC (I've got a Mac!) address? How do I learn these TCP/IP, HTTP, HTTPS, FTP, POP, IMAP, SMTP, what are layers?

1.4 End of Unit Test

1.2 End of Unit Test

Learn to Code in Python
Input/Output, If statements, Loops, Text & Numbers, Random Values, Python Turtle, Creating robust programs, Lists, 2D Lists, Sub Programs. Python Challenges & practice.

PAPER 1

How can 10 = 2?

1.2 Memory & Storage
What is primary & secondary storage and what is the purpose of RAM and ROM, the differences between them, the advantages and disadvantages? Why do we need virtual memory? What is flash memory? What are the common types of storage? What types are use for what? What is data capacity? What's a nibble (is that break time?) What is binary, denary, hexadecimal and ASCII? What is a character set? What are bitmaps, image resolution, colour depth and metadata? How can sound be sampled and stored? How does sampling rates, duration and bit depth affect the size of sound files and quality of its playback? What is compression? What is the difference between lossy and lossless compression?

YEAR 9 GCSE

START OF GCSE

Introduction
Specification requirements. Mark Scheme. Course calendar. Where to find resources. Folder Setup. Workbooks. Homework calendar. Student/Teacher expectations. Understanding of flipped and unflipped learning. What is a computer and what is computational thinking?

1.1 Systems Architecture
What is the CPU? How does it function? What are the components it is made of? What are the common characteristics which affect performance? What are embedded systems? Who is Von Neumann?

CPU

1.1 End of Unit Test

HOMEWORK Current Topic Note Preparation // Prior Topic Online Tool Revision.

ASSESSMENT End of Topic Exam Papers // Classwork Depth & Understanding Assessment.

DNA Pseudocode Challenges // Past Exam Questions // Workbook DiRT

FINAL GRADE: Paper 1 – Computer Systems 1.5 hrs (50%) // Paper 2 - Computational Thinking & Algorithms 1.5hrs (50%)