

# Computing OCR 2 KS4 Subject Curriculum

## LEARNING JOURNEY



### 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?

### 1.2 Memory & Storage

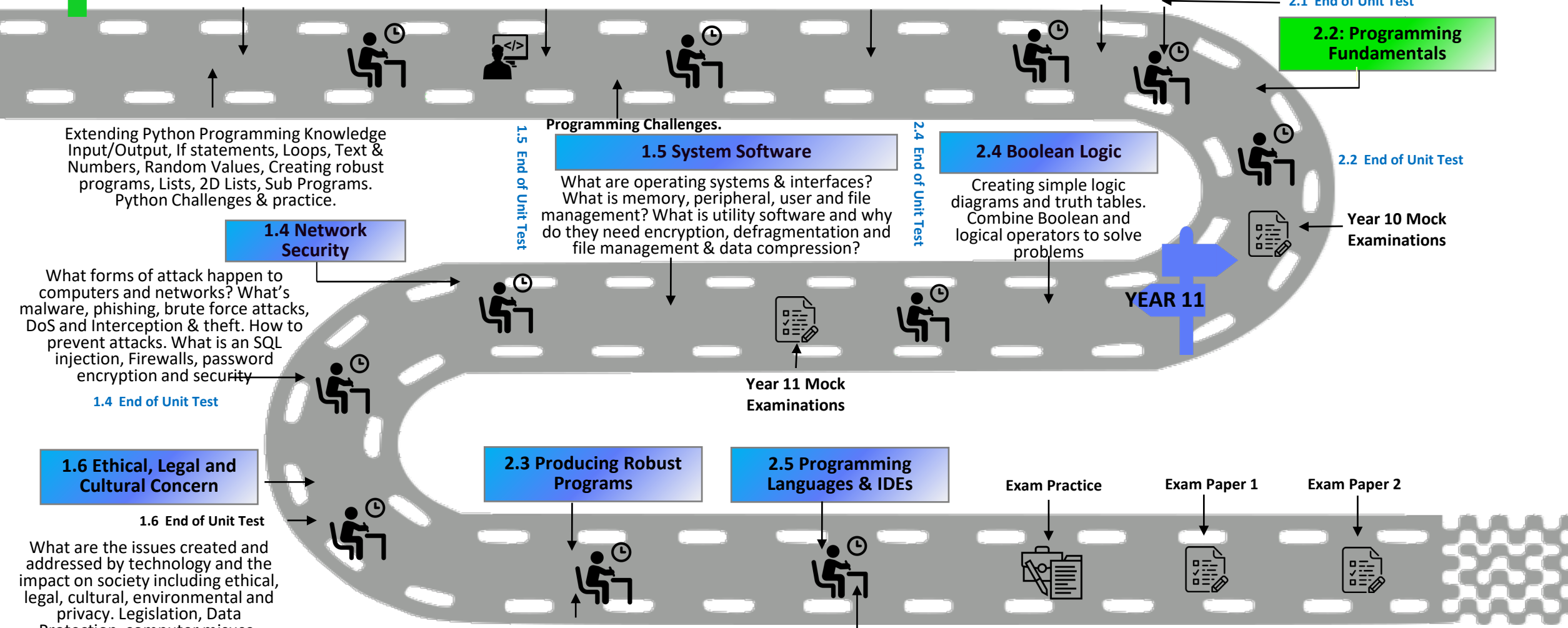
The need for primary & secondary storage? Why do we need virtual memory? What are the common types of storage? What is data capacity? What's a nibble? What is binary, denary, hexadecimal and ASCII? What is a character set? What are bitmaps, image resolution, colour depth and metadata? How can sound be sampled and stored? What is compression?

### 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 are star and mesh network topologies? What is Ethernet, Wi-Fi 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 address?

### 2.1: Algorithms

What are the principles of computational thinking? Designing, creating and refining algorithms. Understand 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?



Extending Python Programming Knowledge Input/Output, If statements, Loops, Text & Numbers, Random Values, Creating robust programs, Lists, 2D Lists, Sub Programs. Python Challenges & practice.

### 1.4 Network Security

What forms of attack happen to computers and networks? What's malware, phishing, brute force attacks, DoS and Interception & theft. How to prevent attacks. What is an SQL injection, Firewalls, password encryption and security

### 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?

### 2.4 Boolean Logic

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

### 2.2: Programming Fundamentals

### 1.6 Ethical, Legal and Cultural Concern

What are the issues created and addressed by technology and the impact on society including ethical, legal, cultural, environmental and privacy. Legislation, Data Protection, computer misuse, copyright and licenses.

### 2.3 Producing Robust Programs

Why use defensive programming? Use of defensive designs. Testing to make sure it works and debugging, is that normal, boundary, invalid or erroneous? Refine it! Create code which is easy to maintain. Know the purpose of testing and types used for validation.

### 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.

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