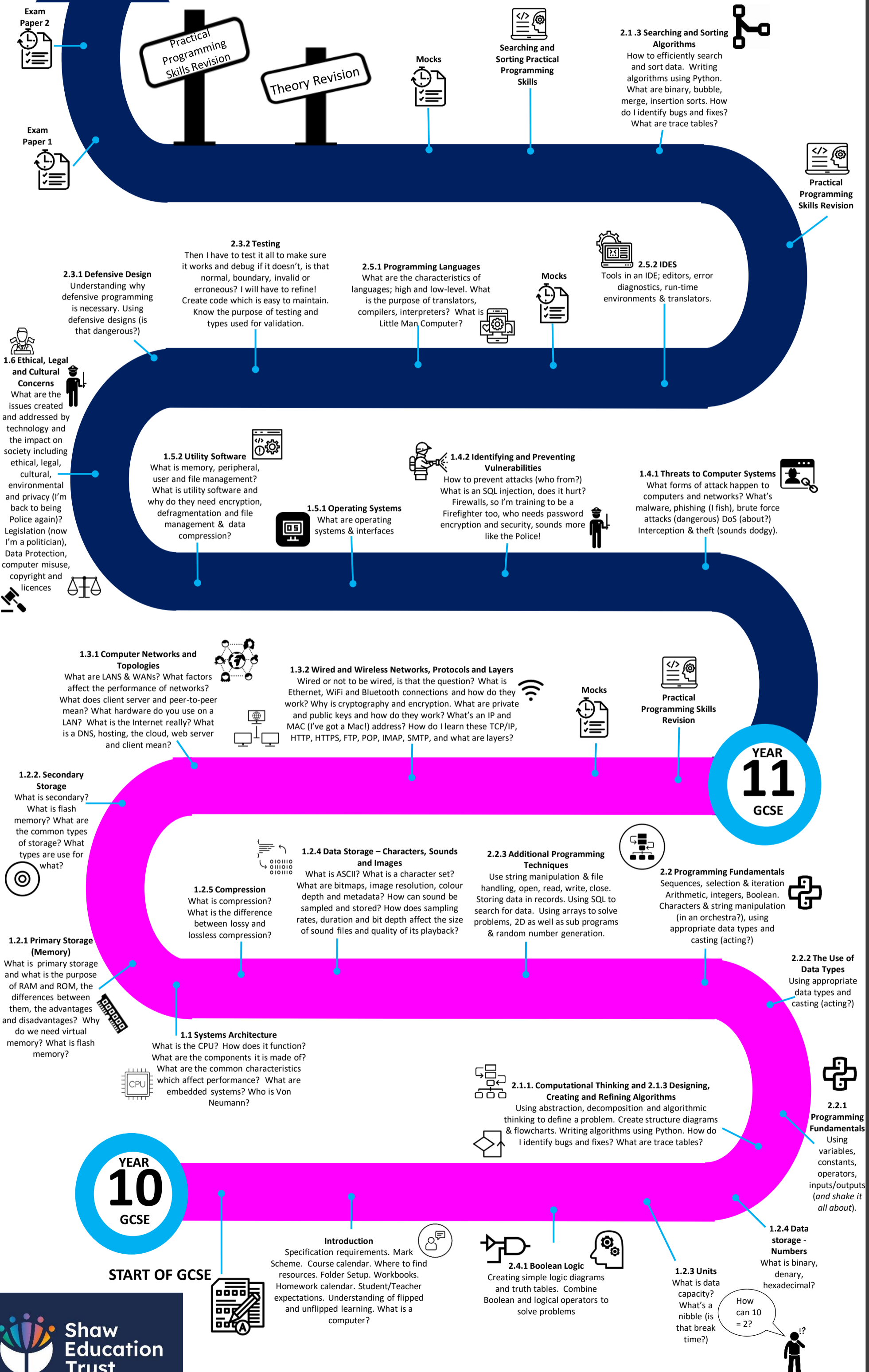**OCR J277 – From 2020**
Component 1 – Computer Systems 1.5 hrs
Component 2 – Computational Thinking, Algorithms & Programming 1.5hrs

MADELEY SCHOOL
Inspiring Excellence

GCSE COMPUTER SCIENCE - LEARNING JOURNEY

SUCCESS COMES FROM HARDWORK

Exam Paper 2

Exam Paper 1

Practical Programming Skills Revision

Theory Revision

Mocks

Searching and Sorting Practical Programming Skills

2.1 .3 Searching and Sorting Algorithms
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?

Practical Programming Skills Revision

2.3.1 Defensive Design
Understanding why defensive programming is necessary. Using defensive designs (is that dangerous?)

2.3.2 Testing
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.

2.5.1 Programming Languages
What are the characteristics of languages; high and low-level. What is the purpose of translators, compilers, interpreters? What is Little Man Computer?

Mocks

2.5.2 IDES
Tools in an IDE; editors, error diagnostics, run-time environments & translators.

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

1.5.2 Utility Software
What is memory, peripheral, user and file management? What is utility software and why do they need encryption, defragmentation and file management & data compression?

1.5.1 Operating Systems
What are operating systems & interfaces

1.4.2 Identifying and Preventing Vulnerabilities
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!

1.4.1 Threats to Computer Systems
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).

1.3.1 Computer Networks and Topologies
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?

1.3.2 Wired and Wireless Networks, Protocols and Layers
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, and what are layers?

Mocks

Practical Programming Skills Revision

YEAR 11 GCSE

1.2.2. Secondary Storage
What is secondary? What is flash memory? What are the common types of storage? What types are use for what?

1.2.4 Data Storage – Characters, Sounds and Images
What is 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?

1.2.5 Compression
What is compression? What is the difference between lossy and lossless compression?

2.2.3 Additional Programming Techniques
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.

2.2 Programming Fundamentals
Sequences, selection & iteration Arithmetic, integers, Boolean. Characters & string manipulation (in an orchestra?), using appropriate data types and casting (acting?)

2.2.2 The Use of Data Types
Using appropriate data types and casting (acting?)

1.2.1 Primary Storage (Memory)
What is primary 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?

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

2.1.1. Computational Thinking and 2.1.3 Designing, Creating and Refining Algorithms
Using abstraction, decomposition and algorithmic thinking to define a problem. Create structure diagrams & flowcharts. Writing algorithms using Python. How do I identify bugs and fixes? What are trace tables?

2.2.1 Programming Fundamentals
Using variables, constants, operators, inputs/outputs (and shake it all about).

YEAR 10 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?

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

1.2.3 Units
What is data capacity? What's a nibble (is that break time?)

1.2.4 Data storage - Numbers
What is binary, denary, hexadecimal?

How can 10 = 2?

!?

Shaw Education Trust