Computing Knowledge Map

What's the 5 year intention? Our curriculum has a strong emphasis on the cumulative acquisition and contextualisation of knowledge.

Light Hall School
The best from everyone, all of the time.

The Big Knowledge Picture

Year 7 → Year 11

- Introduction to computer system and basic office tools
- E-Safety – staying safe
- Computer hardware
- Control & Algorithms
- Programming - basics
- Web design
- Programming
- Digital Artefacts
- E-Safety
- Computer hardware
- Binary & Character Set
- Algorithms
- Legislation & Digital Graphics
- System Security
- Computing Project
- Boolean Logic & Data storage
- Programming and Programming Techniques
- Data Types
- Data Storage & Systems Architecture
- System Security and Software
- Defensive Design & Testing
- Programming

The KS3 Big Questions

Year 7 → Year 9

What is the difference between Cyberbullying and traditional bullying?
What is the difference between RAM & ROM?
What are the main programming constructs?

What are the purpose, use and content of digital artefacts?
Explain the positive impact that technology has had on our lives
Explain the difference between ASCII and Unicode

What are the steps in a binary search?
What are the main pieces of legislation?
What are the main threats to a computer system? How can you prevent them?

The KS4 Big Questions

Year 10 → Year 11

What are the main Boolean expressions? Can you draw their truth tables?
Compare the characteristics of different storage devices

What are the main programming constructs?
How do you write pseudocode?
How do you produce flowcharts?

What are the main searching and sorting algorithms? Can you produce them?

GCSE Exam and Post 16 Destination

YEAR 11

Testing
- What are the main types of test data?
- Penetration testing is when you test the system as you make it
- Verification tests the system meets the specification whereas validation limits the errors

Defensive Design
- How do you authenticate a computer system?

System Software
- What is the main characteristics of an operating system?

System Security
- There are many threats to a computer system, they include phishing, viruses and DDOS Attacks
- What are the main threats to a computer system?

Searching & Sorting Algorithms
- The main sorting algorithms are Bubble, Merge and Insertion
- What are the main sorting algorithms?
- Compare the characteristics of different searching algorithms

Programming
- Binary Search needs the data to be in order whereas a Linear search doesn't
- In industry the main programming languages are C and Java
- How do we convert algorithms into programming code?

System Architecture
- Von Neumann in 1945 came up with the idea of data and instructions being stored in the primary storage
- How can a computer systems performance be improved?
- What are the main characteristics of the CPU?

Data Storage
- Bit is the smallest unit and Petabyte is currently the largest unit size
- How do you calculate the file size of different documents?

Programming
- Python is a high-level programming language which converts written code into computer code
- What are the main programming constructs?

YEAR 10 – KEY STAGE 4

Project
- What is Computational Thinking?
- How do you carry out different types of testing?
- Decomposition is about breaking the task down into small manageable chunks, there are many ways to do this.

Data Rep
- If there is a byte of data and additional data is added it can cause an error or overflow
- What is an overflow in Binary Adding?
- HEX uses a base 16 number system and bridges the gap between binary and denary
- How do you convert into HEX?

Boolean Logic
- Boolean logic is centred around 3 main words – AND, OR & NOT, they can be displayed in Truth Tables
- What are the main logic gates and their expressions?

Data Storage
- Optical, Magnetic and Solid State are the main types of Secondary Storage
- What are the main types of storage and their characteristics?

Algorithm Design
- Computational thinking involves suggesting solutions to problems – this can be done through algorithms
- What are the main command words to use when writing pseudocode?

Data Types
- Real & Float can be used for decimal places
- What data type do you use for text? For date and for numbers?

Programming Techniques
- Iteration, Sequence and Selection are the main programming constructs
- What is the difference between CASE and IF?
- What are the different ways to write a loop?

Computer Hardware
- Clock speed shows how many instructions can be carried out by the computer per second.
- How can a computer systems performance be improved?
- FDE Cycle is also know as the instruction cycle – this is the main function of the CPU
- What is the purpose of the FDE Cycle?
- What are the characteristics of the CPU registers?

System Security
- A network attack is an attempt to gain access to, steal, modify or delete data on a network
- How do you prevent the threats?
- What are the main threats to a computer system?

Legislation & Digital Graphics
- Computer Misuse Act deals with hacking and viruses
- The Data Protection Act was replaced with GDPR in 2018
- What are the main principles of the DPA?
- What are the characteristics of different digital graphics

Algorithms
- The main searching algorithms are Binary and Linear
- Compare the characteristics of searching and sorting algorithms

YEAR 9

Programming
- Python was designed because it was similar to pseudocode
- How do you convert instructions into programming code?
- What is the purpose of testing?

Digital Artefacts
- Pre-Production Documents are used as the first steep in planning a project
- What is the purpose, use and content of different digital artefacts?

E-Safety
- Technology has created jobs and allows people to work from anywhere
- What impact has technology on the world? Discuss the positives and negatives

Computer Hardware
- The central processing unit controls is the part of the computer that allows it to function
- Embedded systems are present in everything we do – cooking, cleaning, telling the time
- What are the characteristics of the CPU?
- What is an embedded system?

Binary
- Binary is number 2 based system (0 or 1), whereas denary is a number 10 based system (0-9)
- How do you convert between Denary and Binary?
- Why do we use HEX?

Character Sets
- A character set is a table of data that links characters to numbers
- What is the difference between ASCII and Unicode?

YEAR 8

Web Design
- How do you write HTML?
- Hyper Text Mark-up Language
- There are over 1.8 billion websites

Programming
- What makes a good website?
- Python is a High-Level programming language
- What are the main programming constructs?

Control & Algorithms
- Keywords when writing pseudocode: IPNUT, OUTPUT, IF, THEN, ELSE
- Flowcharts are visual representations of algorithms
- An algorithm is a set of instructions which is used to create a program
- What is Pseudocode?
- What are the main flowchart symbols?
- What is an algorithm?

Computer Hardware
- A computer system is made up of INPUTS – PROCESSES - OUTPUTS
- What is the difference between RAM & ROM?
- What is the difference between input and output devices?

E-Safety
- When posting pictures think about what the picture shows – it can be dangerous
- E-Safety is about keeping you safe online
- What is a 'Digital Footprint'?
- What is the difference between cyberbullying and traditional bullying?

YEAR 7 – KEY STAGE 3

Excellence • High expectations and aspirations • Love of Learning • Active participation • Sound moral compass