Theoretical Computing

Students will develop an understanding of the following key areas within computing:

1. Systems architecture,

2. The CPU

3. Memory devices

4. Storage devices

5. The internet

6. Types of network

7. Wireless networking

8. Protocols

9. Network security

10. Types of software and their features

11. Ethical, legal, cultural and environmental concerns in computing

12. Data representation

13. Key computing algorithms

14. Developing algorithms to solve given scenarios

It is essential that students have a strong grasp on the key vocabulary associated with the subject allowing them to describe and explain the theory behind how a computer works. Students must also have the knowledge of how to solve a problem and develop a solution. Students will need to understand a range of processes which occur within computers in order to explain how a computer ultimately responds to user input and guarantees security

Programming

• Write algorithms to solve given problems.

• Visually represent algorithms using flowcharts.

• Write subroutines to make flowcharts more manageable.

• Use Python to program solutions to given problems.

• Order code so that Python runs in sequence.

• Store values in variables so they can be manipulated.

• Take user input and store the values in variables.

• Manipulate values using mathematical operators.

• Use selection to decide what code to run based on a condition.

• Make decisions using comparative operators.

• Use iteration to repeat sections of code.

• Work out when to use condition-controlled (while) or count-controlled (for) iteration. • Write functions to better organise programs.

• Pass parameters between functions to make code more efficient.

• Use inbuilt functions contained within libraries.