



# COMPUTING



## YEAR 7

**1. MESSAGING IN DIGITAL MEDIA**

- Research
- Plan and develop a range of media
- Evaluate against criteria

**2. PROGRAMMING IN CODE.ORG**

- Sequencing
- Variables
- Selection
- Count-controlled iteration

**3. MODELLING DATA USING SPREADSHEETS**

- Use cell references and the autofill tool
- Format data including conditional formatting
- Create formulas for add, subtract, divide and multiply
- Create functions for SUM, COUNTA, AVERAGE, MIN, MAX and COUNTIF
- Sort and filter data
- Create graphs

**4. NETWORKING**

- Network technology
- The internet
- Protocols

**5. CYBER EXPLORERS**

- Online safety
- Cyber security
- Cyber careers

## YEAR 8

**12. INTRODUCTION TO WEB DEVELOPMENT**

- Develop and create webpages using HTML
- Cascading Style Sheets (CSS)
- Web search technologies

**11. EXPLORING DATA REPRESENTATION**

- Binary including conversion
- How are text, sound and images stored?
- Data storage

**10. COMPUTER SYSTEMS**

- Hardware and software
- How are instructions stored and executed?
- Boolean logic

**9. DATA VISUALISATION**

- Format data including conditional formatting
- Advanced Excel formulas and functions
- Presenting information

**8. PROGRAMMING EXTENSION WITH TURING LAB**

- Sequence, selection and iteration
- Syntax and coding errors
- Algorithms and functions

**7. VECTOR GRAPHICS**

- Bitmap and vector images
- Plan and create a vector image
- Evaluate the use of vector images

**6. MEDIA FOR A CAUSE**

- Licensing issues involving online content
- Credibility, referencing and evaluating resources
- Plan, create and evaluate digital artefacts

## YEAR 9

**13. ARTIFICIAL INTELLIGENCE (AI)**

- What is AI?
- How do machines learn?
- Opportunities in AI

**14. ADVANCED PROGRAMMING IN PYTHON**

- Data in sequences e.g. lists and strings
- Programming features to develop solutions
- How are instructions stored and executed?

**15. EXPLORING DATA SCIENCE**

- Select, use and combine data
- Present data in a variety of visual forms
- Analyse data and visualisations to draw conclusions

**16. PHYSICAL COMPUTING WITH MICRO BITS**

- Algorithms that reflect computational thinking
- Design, use and evaluate computational abstractions

**17. UNDERSTANDING CYBER SECURITY**

- Profiling
- Data Protection Act and the Computer Misuse Act
- Hacking and malware
- Protection methods e.g. firewalls, anti-malware and password authentication

**18. INVICTUS**

- Create, reuse, revise and repurpose digital artefacts
- Understand trustworthiness, design and usability

## GCSE

**6. CYBER SECURITY**

- Fundamentals of cyber security
- Cyber security threats
- Social engineering
- Malicious code (malware)
- Methods to detect and prevent cyber security threats

**5. FUNDAMENTALS OF COMPUTER NETWORKS**

- Advantages and disadvantages
- Topologies
- Protocols
- Network security

**4. COMPUTER SYSTEMS**

- Hardware and software
- Boolean logic
- Software classification
- Classification of programming languages and translators
- Systems architecture

**3. FUNDAMENTALS OF DATA REPRESENTATION**

- Number bases and converting between them
- Units of information
- Binary arithmetic
- Representing text, images and sound
- Data compression

**2. PROGRAMMING**

- Data types and data structures
- Programming concepts
- Arithmetic, Boolean and Relational operations
- Input / output including string handling and random numbers
- Structured programming and subroutines

**1. FUNDAMENTALS OF ALGORITHMS**

- Representing algorithms
- Efficiency of algorithms
- Searching algorithms
- Sorting algorithms

## A LEVEL

**7. RELATIONAL DATABASES AND STRUCTURED QUERY LANGUAGE (SQL)**

- Relational databases
- Structured query language (SQL)

**8. ETHICAL, LEGAL AND ENVIRONMENTAL IMPACTS OF DIGITAL TECHNOLOGY**

- Cyber security
- Mobile technologies
- Wireless networking
- Cloud storage
- Hacking
- Wearable technologies
- Computer based implants
- Autonomous vehicles

**1. COMPONENTS OF A COMPUTER AND THEIR USES**

- Structure and function of the processor
- Types of processor
- Input, output and storage

**2. SOFTWARE AND SOFTWARE DEVELOPMENT**

- Systems software
- Applications generation
- Software development
- Types of programming language

**3. EXCHANGING DATA**

- Compression, encryption and hashing
- Databases
- Networks
- Web technologies

**4. DATA TYPES, DATA STRUCTURES AND ALGORITHMS**

- Different algorithms that can be applied to these structures
- Data types
- Data structures
- Boolean algebra

**9. PROGRAMMING PROJECT**

- Analysis of the problem
- Problem identification
- Stakeholders
- Research the problem
- Specify the proposed solution
- Design the solution
- Decompose the problem
- Describe the solution

- Describe the approach to testing
- Developing the solution
- Iterative development process
- Testing to inform development
- Evaluation
- Testing to inform evaluation
- Success of the solution
- Describe the final product
- Maintenance and development

**8. ALGORITHMS**

- Using algorithms to describe problems and standard algorithms

**7. PROBLEM SOLVING AND PROGRAMMING**

- Programming techniques
- Computational methods

**6. ELEMENTS OF COMPUTATIONAL THINKING**

- Thinking abstractly
- Thinking ahead
- Thinking procedurally
- Thinking logically
- Thinking concurrently

**5. LEGAL, MORAL, CULTURAL AND ETHICAL ISSUES**

- Legislation surrounding the use of computers and ethical issues that can or may in the future arise from the use of computers
- Computer related legislation
- Moral and ethical issues

