# Year 8 Computing Curriculum at The Herewoode Academy

| | Topic | Road Map | Key Knowledge & Skills |
|---|---|---|---|
| **Aut1** | **Using Computers** | L1 Welcome back to the School Network<br>L2 What to Trust Online<br>L3 Search Engines<br>L4 Copyright<br>L5 Online Dangers<br>L6 Cyber Abuse<br>L7 Artificial Intelligence<br>L8 End of Topic Assessment | **Strand 6:**<br>**Information Technology, Graphic Design**<br><br>Awareness of computing policies, Evaluating the credibility of online information. Identifying misinformation, bias, and fake news. Understanding how search engines work. What copyright is. Understanding intellectual property and fair use. Recognising and avoiding online dangers. |
| **Aut2** | **Python PRIMM** | L1 Sequencing & Variables<br>L2 Input & Output<br>L3 Selection – IF, ELIF, ELSE<br>L4 Iteration – WHILE Loops<br>L5 Iteration – FOR Loops<br>L6 Games Development<br>L7 Independent PRIMM<br>L8 End of Topic Assessment | **Strand 2:**<br>**Python Programming, Sequence, Selection & Iteration**<br><br>Understanding the importance of sequencing in programming. Using variables to store data. Basic data types (str, int, float, bool). Using input functions to get user data. Displaying output using print statements. Understanding conditional statements (IF, ELSE). Understanding how loops work, Iteration (FOR, WHILE). |
| **Spr1** | **Digital Images** | L1 Introduction to Digital Images<br>L2 Understanding Vector Graphics<br>L3 Creating Icons using Vector Graphics<br>L4 Understanding Bitmap Images<br>L5 Resolution & Colour Depth<br>L6 End of Topic Assessment | **Strand 3:**<br>**Data Representation, Binary & Boolean Logic**<br><br>Understanding what digital images are and how they are stored. Differences between bitmap (raster) and vector graphics**.** Applying vector graphic tools to design images. Graphic design, creation, planning, manipulation tools. |
| **Spr2** | **Emerging Technologies** | L1 AI & Computational Thinking<br>L2 Cryptography<br>L3 Modern Day Encryption<br>L4 Augmented Reality<br>L5 End of Topic Assessment | **Strand 4:**<br>**Computer Hardware, Software & OS**<br><br>Understanding Artificial Intelligence. Introduction to Machine Learning and how AI systems make decisions Exploring encryption methods: Substitution ciphers and modern day encryption. Understanding Augmented Reality. |
| **Sum1** | **Cybersecurity** | L1 Social Engineering<br>L2 Malicious Software<br>L3 Hacking & Other Types of Attack<br>L4 Preventing Network Threats<br>L5 Cryptography & Encryption<br>L6 End of Topic Assessment | **Strand 5:**<br>**Networking, Internet & Network Security**<br><br>Understanding social engineering and how attackers manipulate people to gain access to data. Identify how malware spreads and infects systems. Different types of cyberattacks. Preventing cyber attacks: firewalls, Anti-virus. |
| **Sum2** | **Flowol** | L1 Algorithms & Flowcharts<br>L2 Real World Systems<br>L3 Selection<br>L4 End of Year Assessment<br>L5 Iteration<br>L6 Subroutines | **Strand 1:**<br>**Computational Thinking, Problem Solving & Algorithms**<br><br>Exploring Computational Thinking concepts: Decomposition, Abstraction, Algorithms & Pattern Recognition. Understanding of algorithms in the form of a flowchart (terminator, input/output, process, decision). |

# Year 8 Computing Curriculum at The Herewoode Academy

Throughout the academic year, Year 8 students at The Herewoode Academy will continue to develop their digital skills, computational thinking, and problem-solving abilities. They will build on their foundational knowledge from Year 7 and explore more advanced computing concepts, programming techniques, and digital applications.

**1. Effective Use of Computers** **(Strand 6: Information Technology & Design)**
Students will refine their ability to use computers efficiently and responsibly. This includes effective file management, cloud storage, Office365 applications, email etiquette, and online safety. They will also enhance their understanding of cybersecurity, focusing on threats such as phishing, malware, and data privacy.

**2. Python PRIMM** **(Strand 2: Python Programming, Sequence, Selection & Iteration)**
Building on their previous programming experience, students will learn Python using the PRIMM (Predict, Run, Investigate, Modify, Make) methodology. They will reinforce key concepts such as sequencing, selection, and iteration while developing logical thinking and debugging skills.

**3. Digital Images** **(Strand 3: Data Representation, Binary & Boolean Logic)**
Students will explore the representation of digital images, including pixels, resolution, and color depth. They will learn about bitmap and vector graphics and use image editing software to manipulate and create digital artwork.

**4. Emerging Technologies** **(Strand 4: Computer Hardware, Software & AI)**
This unit introduces students to the latest advancements in computing, such as artificial intelligence, virtual reality, blockchain, and the Internet of Things (IoT). They will explore how these technologies impact society, industry, and daily life.

**5. Cybersecurity** **(Strand 5: Networking, Internet & Network Security)**
Students will deepen their understanding of cybersecurity threats and defences. They will examine hacking techniques, encryption, firewalls, and authentication methods. Ethical considerations and the importance of personal and organisational security will also be explored.

**6. Flow** **(Strand 1: Computational Thinking, Problem Solving & Algorithms)**
Students will develop a structured approach to problem-solving using flowcharts and pseudocode. They will learn how to break down complex tasks into logical steps and represent algorithms visually to improve their computational thinking skills.

**Overall Learning Outcomes:**
By the end of Year 8, students will have:
- ☑ Strengthened their ability to use computers effectively and responsibly.
- ☑ Gained hands-on experience in Python programming using the PRIMM methodology.
- ☑ Developed skills in digital image editing and an understanding of image representation.
- ☑ Explored emerging technologies and their impact on society.
- ☑ Gained awareness of cybersecurity threats and best practices for digital safety.
- ☑ Improved problem-solving skills through flowchart creation and algorithmic thinking.

This curriculum builds upon the foundational skills from Year 7 and equips students with the necessary digital literacy, programming expertise, and problem-solving abilities to prepare them for further computing studies and the ever-evolving world of technology.

# Year 8 Computing Curriculum at The Herewoode Academy

## Assessment

At the end of each topic in Computing, students will be assessed through a comprehensive evaluation process in the form a **summative assessment**, designed to test their understanding and practical application of the unit's content. This includes an **end-of-topic quiz** consisting of 40 questions that assess their prior learning and retention of key concepts. Additionally, students will complete a **practical challenge**, requiring them to apply their knowledge in a hands-on scenario, reinforcing problem-solving skills and real-world application. To further stretch and challenge their thinking, learners will tackle **three GCSE-style questions**, encouraging them to engage with higher-level questioning and develop exam-style responses. Finally, before leaving the classroom, students will participate in **diagnostic questioning**, allowing teachers to gauge their immediate understanding, address misconceptions, and provide instant feedback to support further learning.

At the end of the academic year, students will complete a **cumulative assessment** designed to evaluate both their theoretical understanding and practical skills in Computing. This assessment will revisit key topics from previous assessments, ensuring that students can recall and apply their knowledge effectively over time. By incorporating a mix of theory-based questions and practical challenges, the test will measure their ability to think critically, problem-solve, and demonstrate proficiency in essential computing concepts. The score from this assessment will serve as an indicator of each student's overall achievement in Computing throughout the academic year, providing valuable insight into their progress and areas for further development.

students will complete their **homework assessments** every three lessons through a **Microsoft Forms quiz**. These quizzes are designed to test their understanding of the previous lesson's content, reinforcing key concepts and ensuring knowledge retention over time. By regularly engaging with these assessments, students develop **independent study habits, self-discipline, and recall skills**, which are essential for mastering computing topics. The quizzes provide instant feedback, allowing students to identify areas for improvement and revisit challenging concepts. This structured approach to homework helps to consolidate learning, track progress, and prepare students for future assessments in a manageable and engaging way.

## Independent Learning

In Computing, students will develop their **independent learning skills** by working through a **topic-based booklet** for each unit. These booklets contain a variety of **problem-solving tasks and independent challenges**, encouraging students to take ownership of their learning and apply their knowledge in different contexts. Through this approach, students will enhance key skills such as **critical thinking, resilience, and self-motivation**, as they learn to tackle challenges without immediate teacher guidance. Additionally, independent learning will help improve **time management, research skills, and adaptability**, which are essential not only in Computing but also in real-world problem-solving and future studies. By developing these skills, students will become more confident and capable learners, better prepared for higher-level education and careers in technology.

## Oracy

In Computing, students will develop their **oracy skills** and understanding of **key vocabulary** through a range of activities designed to enhance their communication and technical language proficiency. Throughout each topic, students will engage in **class discussions, presentations, and collaborative problem-solving tasks**, allowing them to articulate their ideas clearly and confidently. Teachers will introduce and reinforce subject-specific terminology, ensuring that students can accurately use technical vocabulary when explaining concepts, debugging code, or discussing digital literacy topics. Additionally, students will apply key terms in written tasks, verbal explanations, and peer discussions, helping to strengthen their ability to communicate effectively in both academic and real-world computing contexts. By developing these skills, students will improve their ability to express complex ideas, justify their reasoning, and engage in meaningful discussions, preparing them for future learning and careers in technology.

| | Autumn 1<br>8 weeks | Autumn 2<br>8 weeks | Spring 1<br>6 weeks | Spring 2<br>5 weeks | Summer 1<br>6 weeks | Summer 2<br>6 weeks |
|---|---|---|---|---|---|---|
| **Year 7** | **Introduction to The Herewoode Academy School Network**<br>- Office365, Teams<br>- Online Safety | **Computational Thinking**<br>- Flowcharts<br>- Algorithms<br>- Scratch<br>- Problem Solving | **Spreadsheets**<br>- Microsoft Excel<br>- Formulas<br>- Databases<br>- Charts & Graphs<br>- Selection IF, ELSE | **Introduction to Coding in Python**<br>- code.org<br>- Block-Based Programming<br>- Python | **Hardware & Software**<br>- Operating Systems<br>- Application & Utility<br>- Inside the Computer<br>- CPU, RAM & ROM | **Graphic Design**<br>- Raster Graphics<br>- Pixel Art (Binary)<br>- Storing Images<br>- Storyboards<br>- Creation |
| **Year 8** | **Using Computers**<br>- Search Engines<br>- Copyright<br>- Cyber Abuse<br>- Online Dangers | **Python PRIMM**<br>- Predict, Run, Investigate, Modify, Make.<br>- Programming | **Digital Images**<br>- Bitmap Images<br>- Vector Graphics<br>- Image Manipulation<br>- Metadata | **Emerging Technologies**<br>- Artificial Intelligence<br>- Cryptography<br>- Encryption | **Cyber Security**<br>- Social Engineering<br>- Malicious Software<br>- Hacking<br>- Preventing Threats | **Flowol**<br>- Flowcharts<br>- Algorithms<br>- Problem Solving<br>- Sub-Routines |
| **Year 9** | **Python Advanced**<br>- Input/Output<br>- Programming Constructs<br>- Lists/Arrays<br>- Subroutines | **Data Representation**<br>- Binary Conversion<br>- Character Sets<br>- Hexadecimal<br>- Storing Data | **Web Design**<br>- HTML<br>- CSS<br>- JavaScript<br>- Flowcharts<br>- Web Development | **Computer Networks**<br>- Network Dangers<br>- Network Security<br>- IP's & Protocols<br>- Network Hardware<br>- Types of Network | **Impact of Technology**<br>- Legal, Ethical, Cultural & Environmental Impacts of Technology | **Systems Architecture, Memory & Storage**<br>- CPU, RAM, ROM<br>- Secondary Storage |

**Strand 1:** Computational Thinking, Problem Solving & Algorithms

**Strand 2:** Python programming, sequence, selection & Iteration

**Strand 3:** Data Representation Binary & Boolean Logic

**Strand 4:** Computer Hardware, Software & AI

**Strand 5:** Networking, Internet & Network Security

**Strand 6:** Information Technology Graphic Design

# KS3 Computing Roadmap

**Sum2** Systems Architecture

**Sum1** Impact of Technology

**Spr2** Computer Networks

World Wide Web

HTML5

**Aut1** Python Advanced

**Aut2** Data Representation — Hello my name is

**Spr1** Web Design

**Year 9**

**Sum2** Flowol

START

**Sum1** Cybersecurity

**Aut2** Python PRIMM

**Spr1** Digital Images — JPEG

**Spr2** Emerging Technologies — AI

**Aut1** Using Computers

**Year 8**

**Sum2** Graphic Design — Ps

**Spr1** Spreadsheets

**Spr2** Introduction to Coding in Python

**Sum1** Hardware & Software — CPU

**Aut2** Computational Thinking — SCRATCH

**Aut1** Introduction to The Herewoode Academy School Network

**Year 7**

## Strand 1:
Computational Thinking, Problem Solving & Algorithms

## Strand 2:
Python Programming, Sequence, Selection & Iteration

## Strand 3:
Data Representation Binary & Boolean Logic

## Strand 4:
Computer Hardware, Software & AI

## Strand 5:
Networking, Internet & Network Security

## Strand 6:
Information Technology Graphic Design

The Herewoode Academy

## Computing
Computer Science | Information Technology | Creative iMedia