GCSE

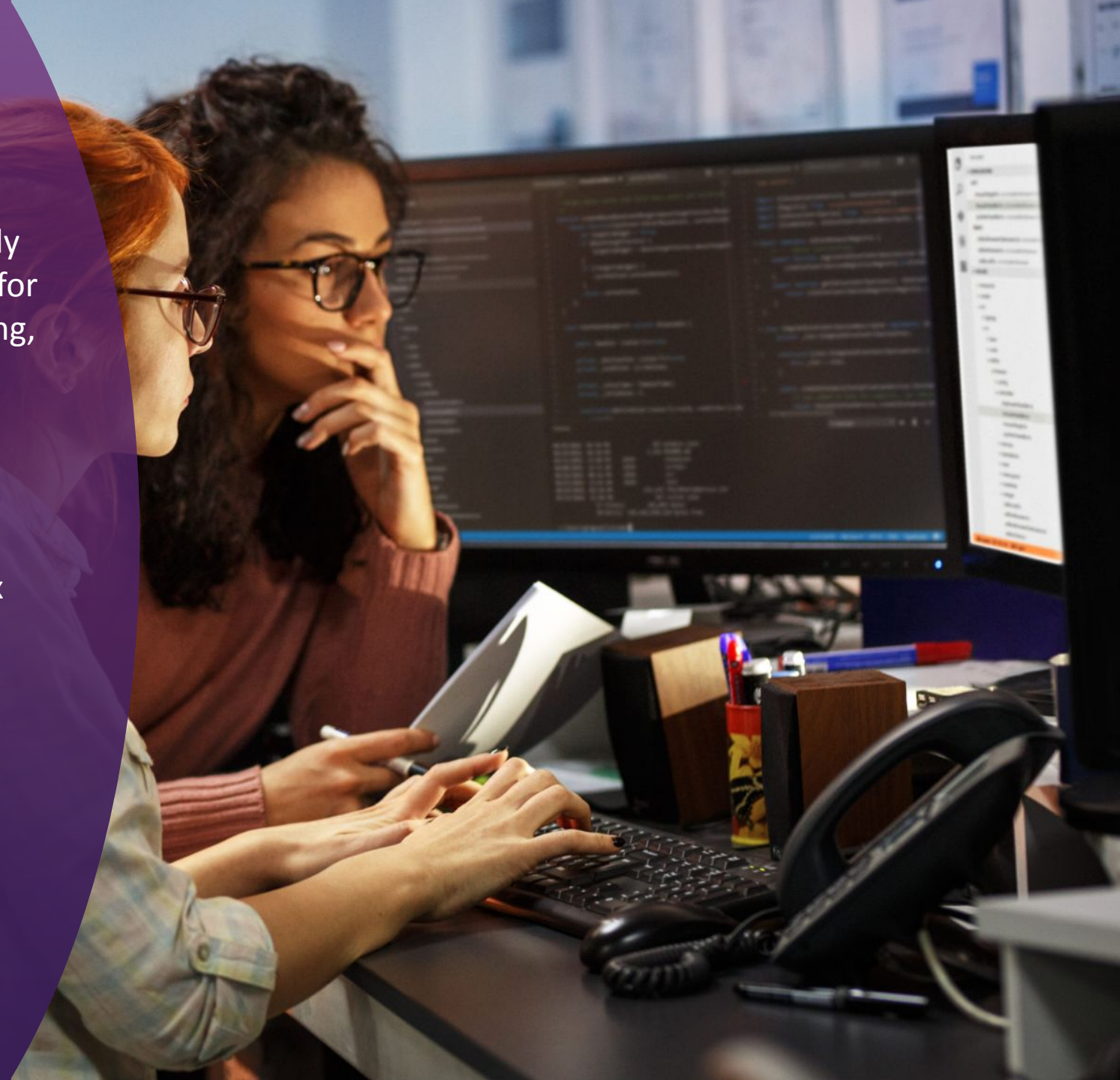
Computer science

NORTHAMPTON SCHOOL FOR GIRLS

What is Computer Science

- **GCSE Computer Science** equips students with computational thinking, programming, and problem-solving skills essential for further study and careers in technology. It lays a foundation for A-Level Computer Science, software engineering, and cybersecurity.

- You will develop skills in:
  - **Programming**: **Writing, debugging, and optimising code.**
  - **Problem-Solving:** Breaking down complex tasks logically.
  - **Data & Systems:** Understanding how computers store and process data.
  - **Networking & Security:** Learning data transmission and protection.
- This could lead to careers in:
  - **Tech Careers:** Software Development, Cybersecurity, AI, Game Development.
  - **Other Fields:** Finance, Healthcare, Retail, Business Analytics



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Course Overview and structure.

Paper 1: Principles of Computer Science (1CP2/01)

- **Assessment type:** Written examination
- **Duration:** 1 hour 30 minutes
- **Weighting:** 50% of the qualification (75 marks)

Paper 2: Application of Computational Thinking (1CP2/02)

- **Assessment type:** Onscreen practical examination
- **Duration:** 2 hours
- **Weighting:** 50% of the qualification (75 marks)

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Assessment

Computer Science is a GCSE Award and is graded from 1-9.

Assessment Objectives (AO):

1. **AO1 – Demonstrate knowledge and understanding**
   - Recall, describe, and explain fundamental concepts of computer science.
   - Covers facts, terminology, principles, and theories related to computing.
2. **AO2 – Apply knowledge and understanding**
   - Apply computational thinking skills to analyse problems.
   - Interpret, modify, and work with algorithms and programming constructs.
   - Solve theoretical and practical computing problems.
3. **AO3 – Analyse and evaluate**
   - Develop, test, and refine programs.
   - Evaluate the effectiveness, efficiency, and reliability of solutions.
   - Make reasoned judgements based on evidence.

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Computer Science (1CP2/01)

Paper 1: Principles of Computer Science (1CP2/01)

- **Assessment type:** Written examination
- **Duration:** 1 hour 30 minutes
- **Weighting:** 50% of the qualification (75 marks)
- **Nature of the unit:**
  - Assesses theoretical knowledge and understanding of computer science principles.
  - Includes multiple-choice, short-, medium-, and extended-response questions.
  - Focuses on computational thinking, data representation, computer hardware/software, networks, cybersecurity, and the ethical, legal, and environmental impact of digital technology.

Topics Covered:

1. **Computational Thinking** – Understanding algorithms, problem-solving, and logical reasoning.
2. **Data Representation** – Binary, hexadecimal, images, sound, compression.
3. **Computer Systems** – Hardware, software, operating systems, and storage.
4. **Networks & Security** – Network types, protocols, security threats and prevention.
5. **Ethical, Legal, and Environmental Impact** – The role of computers in society and related concerns.

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Computer Science (1CP2/02)

- **Assessment type:** Onscreen practical examination
- **Duration:** 2 hours
- **Weighting:** 50% of the qualification (75 marks)
- **Nature of the unit:**
  - A practical coding assessment conducted on a computer.
  - Assesses problem-solving skills, algorithm design, and programming proficiency.
  - Students write, test, debug, and refine code using **Python 3**, following the **Programming Language Subset (PLS)**.

Skills Assessed:

1. **Understanding Algorithms** – Writing, interpreting, and modifying algorithms.
2. **Decomposition & Abstraction** – Breaking down complex problems into smaller tasks.
3. **Programming Constructs** – Sequence, selection, iteration, functions, and error handling.
4. **Testing & Debugging** – Identifying and fixing logical and syntax errors.
5. **Code Efficiency & Documentation** – Writing optimised and well-structured code.

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Key Career Skills

- **Problem-Solving:** Applying logical thinking to break down complex problems.
- **Critical Thinking:** Analysing situations and making data-driven decisions.
- **Attention to Detail:** Debugging and troubleshooting code effectively.
- **Creativity & Innovation:** Designing new solutions and improving existing systems.
- **Collaboration & Communication:** Working with others in teams to develop software or analyse data.

Future career opportunities

Studying **Computer Science** can lead to a career in:

- **Software Development & Engineering**
- **Cybersecurity**
- **Artificial Intelligence & Data Science**
- **Game Development**
- **Network Engineering**
- **IT Support & Systems Administration**
- **Finance & Business Analytics**

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Future study opportunities

Studying **Computer Science** can lead to further study in;

- Any relevant subject at Level 3 (A level), for example at **NSG** we offer:
  - **Computer Science**
  - **Physics**
  - **Mathematics** or **Further Maths**
  - **Business studies**

- Other subjects, such as;
  - **Computing subjects,** such as **web design** and **computer science.**
  - **Design subjects,** such as **graphic or textile design** or **illustration**.

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