

GCSE → A-Level Computer Science Bridging Booklet

Summer holiday study programme

1. Introduction

This booklet is designed to help you transition smoothly from GCSE to A-Level Computer Science. Completing the weekly tasks (about three hours per week) will strengthen your subject knowledge, coding confidence and, crucially, the independent study habits needed for post-16 success.

Golden rule: three one-hour blocks are far more effective than a single three-hour cram session. Schedule study sessions, set reminders and work with a study buddy where possible.

2. Ten-Week Study Calendar Ideas

Aim for roughly one hour per task – three hours in total each week. Complete as many as you can!

Week	Core topic & why	Tasks (~1 hr each)	Stretch / extension
1	Python recap	a) Re-implement some GCSE coursework from scratch. (See pdf document for coding problem) b) Comment lines of code	Solve 5 Project Euler problems. About - Project Euler
2	Algorithmic thinking – fundamental for Unit 10,11,12.	Trace bubble, insertion and merge sort by hand by finding code samples	Measure run-time using Python's <code>*timeit*</code> .
3	Object-oriented programming.	Discover what OOP is and find what makes it different	Try an online OOP kata (e.g. Bank-kata)
4	Data representation refresher.	Create ASCII↔binary/hex flashcards (Quizlet). Build a binary-to-denary converter in Python.	
5	Computer architecture.	Draw the fetch-execute cycle and narrate it as a 60-second video.	Have a look at the Little Man Computer and trace the flow of data
6	Maths for CS (Boolean algebra, sets, discrete maths).	Complete Isaac A Level Questions Computer Science Boolean Identities topic. Isaac Computer Science	Prove De Morgan's laws using truth tables *and* algebra (very stretch!)
7	Problem-solving competitions.	Attempt past Advent of Code practice problems.	Aim for top-50 in HackerRank 'Algorithms-Easy' leaderboard.

8	Databases & SQL.	SQLZoo tutorials 1–4. SQLZoo	Design an ERD for a school library system.
9	Software development lifecycle & NEA prep.	Read one NEA exemplar from the OCR website	Draft a user-requirements interview script.
10	Reflect & consolidate.	Write a 300-word blog post: “What surprised me most.”	Peer-review meeting with study buddy.

3. Retrieval & Reflection Materials

- **Diagnostic quiz** – auto-marked Microsoft Form with links to revisit topics will be set when you start in September.
- **Start a Flashcards deck** – 150+ key A-Level terms in Quizlet; add your own examples and analogies (example: [OCR Computer Science A Level - Key Terms Flashcards | Quizlet](#))

4. Recommended Resources

Purpose	Resource
Video explanations	<ul style="list-style-type: none"> • Computerphile YouTube channel • Harvard CS50x (Weeks 0–5) CS50x 2025
Interactive practice	<ul style="list-style-type: none"> • IsaacComputerScience.org Isaac Computer Science • SQLZoo SQLZoo • Project Euler About - Project Euler
Reading	<ul style="list-style-type: none"> • <i>Code</i> – Charles Petzold Code by Charles Petzold • <i>Algorithms to Live By</i> – Christian & Griffiths
IDEs & tools	<ul style="list-style-type: none"> • Replit (quick snippets) • VS Code + GitHub Desktop (projects) • Logisim-evolution (logic circuits)
Structured reflection	Write a weekly metacognitive log and engage in buddy discussion.