

Welcome to the course:

PGCE in Computer Science with ICT

A big welcome from Ian

- Ian Needham Senior Lecturer in Education and course leader for the Computer Science PGCE
- I am really looking forward to meeting you all in person and helping you to become outstanding teachers.
- I have included some information which will hopefully help but please do contact me if you have further questions.
- Why not get a cup of tea and look at these slides.



A very challenging but rewarding year

- I am really excited about next year and I am sure you are.
- We need to be really prepared for the start in September.
- It will help enormously if you are ahead of the game.
- The main focus of the SKAP (Subject Knowledge Advanced Pedagogy) element of the course is to show you how to teach the subject and not to teach the content.
- For this reason you need to be up to speed with as much of the content as you can be.
- Here are some things which will help.

We can roughly split up our subject into two parts

Programming

- Computational Thinking
- Problem solving
- KS3 – Scratch
- KS4 – Python
- KS5 – OOP / assembly / functional programming.

Computer Science Theory

- Systems Architecture
- Networking
- Cyber Security
- Systems software & language translators
- Logic gates
- The impact of computer Science on society.

Activities to have a go at

Programming

- You will need to understand the basics of sequencing, selection, iteration and variables.
- Learn Python – lots of online resources such as <https://www.learnpython.org/> and <https://www.w3schools.com/python/>
- You will need to have a grip of all the content at KS4.

GCSE Programming skills

2.2.1 Programming fundamentals

- The use of variables, constants, operators, inputs, outputs and assignments
- The use of the three basic programming constructs used to control the flow of a program:
 - Sequence
 - Selection
 - Integration (count-and-condition-controlled loops)
- The common arithmetic operators
- The common Boolean operators - AND, OR, NOT

2.2.2 – Data types

- The use of data types
 - Integer, Real, Boolean, Casting, and Character and string

2.2.3 – Additional programming techniques

- The use of basic string manipulation
- The use of basic file handling operations:
 - Open, Read, Write and Close
- The use of records to store data
- The use of SQL to search for data
- The use of arrays (or equivalent) when solving problems including one-dimensional and two-dimensional arrays
- How to use sub programs (functions and procedures) to produce structured code
- Random number generation

Activities to have a go at

Curriculum content

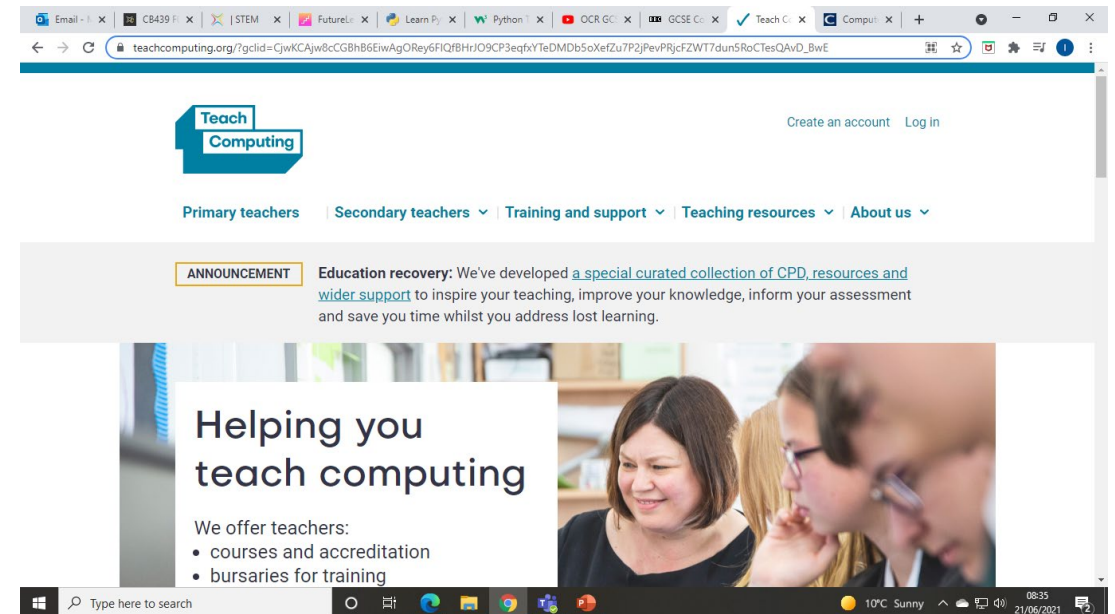
- <https://www.bbc.co.uk/bitesize/subjects/zvc9q6f>
- <https://www.bbc.co.uk/bitesize/examspecs/zmtchbk>
- Watch the craig n Dave videos on YouTube
<https://tinyurl.com/4t22f4b8>

GCSE and A-level exam board (OCR) – complete an exam paper

- <https://www.ocr.org.uk/subjects/computing/>

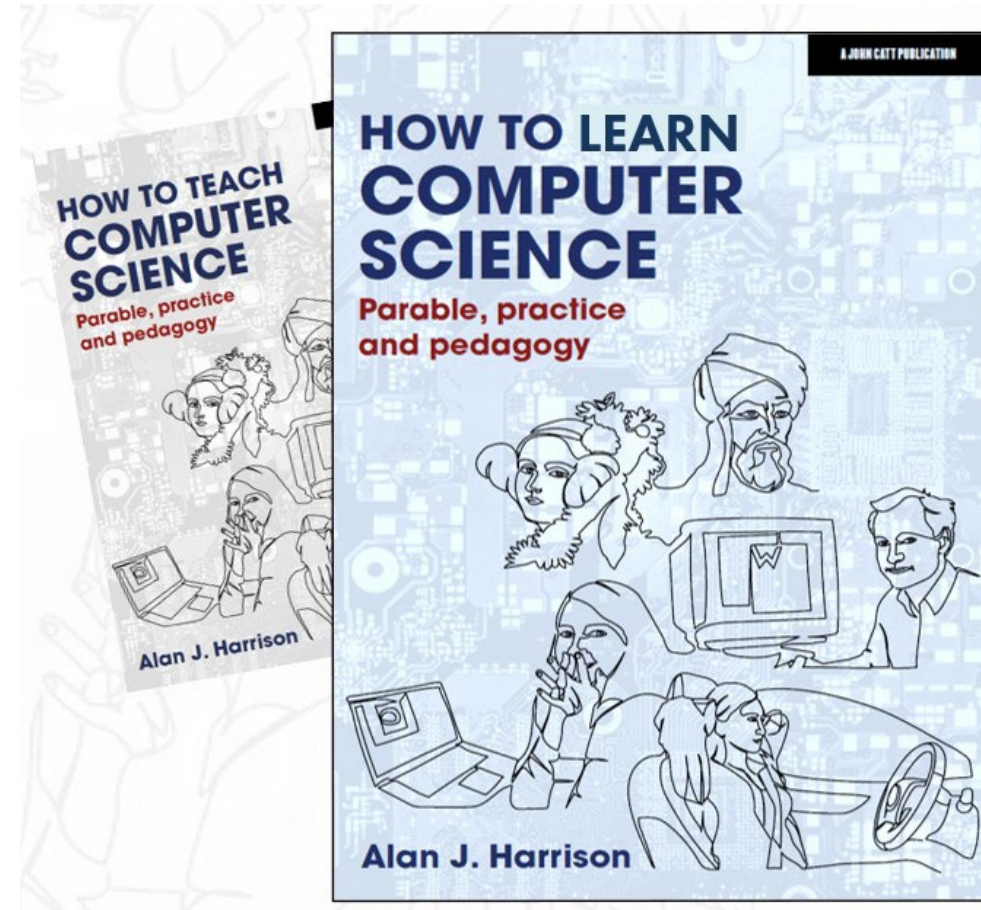
NCCE

- National Centre for Computing Excellence
- Government funded program of resources and courses
- [You can register for free courses as part of the](https://teachcomputing.org/) Computer Science Accelerator program – when completing the registration put down the university instead of the school
- <https://teachcomputing.org/>



Other pre course reading

- [Pedagogy \(teachcomputing.org\)](http://teachcomputing.org)
 - a series of Computer Science specific research papers on how to teach our subject.
- How to Teach Computer Science: Parable, practice and pedagogy
Alan J Harrison
- Teaching Computing in Secondary Schools: A Practical Handbook – William Lau



Any more questions?

Just get in touch!



Good luck with the pre work and
have a good rest.

I look forward to seeing you all in September, please
get in touch if you have any questions or need any
help at all.