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# Interview for the PGCE in Computing

Congratulations on having been offered an interview for a place on the PCGE course for September 2024. As you will have read from the pre-interview information online, the interview process provides an insight into the course and an opportunity for you to ask questions. The day will comprise of several different activities that enable you to demonstrate a variety of attributes and skills that successful teachers draw upon to enable learning to happen in the classroom and therefore is fair and rigorous.

This document provides an overview of the subject element of the interview day and should be read in conjunction with the main webpage. There are two key processes that make up the subject element of the selection process.

## The Subject Interview

In the afternoon, you will have a specialist subject interview in which you will explore a range of topics; these are likely to include:

* Your view of how computing could/should be taught in the classroom and how that could link to the current UK Computing curriculum.
* Your proficiency in at least one programming language.
* Be able to verbally explain the technical journey of how typing a URL into a browser becomes a functional webpage that user can interact with.
* A discussion about your creative lesson planning task from the morning’s Group interview – remember this should not be based on your specialist subject. See notes about the Group interview
* Examples of working-with or understanding of working-with young people.

## Initial Subject Knowledge Audit in Computer Science

Below you will find a copy of the Initial Subject Knowledge Audit in Computing, which you should complete and bring a copy with you to the interview day to discuss.

We look forward to meeting you.

Best wishes,

Allan Callaghan

Subject Lead for Secondary Computing in Initial Teacher Education

Canterbury Christ Church University

## Initial Subject **Knowledge** Audit

This audit aims to help you:

* Understand what “subject knowledge” means for your subject.
* Perform a gap analysis of your own skills.
* Guide you with building subject knowledge before you start the course.

No teacher knows everything about their subject.

There are no defined list of topics or other information that must be known by subject practitioners.

It is important that you have a map of the wider concepts.

## What the PGCE “is” and “isn’t”

* The one-year PGCE course will be focused on developing your “Subject Pedagogy” e.g. How do you effectively teach XYZ.
* The course will not be focused on developing “Subject Knowledge” e.g. Your skills or knowledge about XYZ

You will be taking responsibility for learning new material and raising your level of subject knowledge. This is an aspect of the course in which you need to develop independent strategies for learning.

## Subject Knowledge Level Descriptors

What do your levels of competence look like in different Computing topic areas?

For each area listed, indicate where you assess your level of competence to be currently. Please use the descriptions provided and be frank and honest in your self-assessment. Do not spend more than 30min on this task.

The level descriptions should be used as a guide rather than a check list, to aid you. We are not expecting you to be able to demonstrate many areas at level 3 or 4 at this stage, therefore do not worry about ticking any of the boxes as this audit is used as a tool to help support and develop your subject knowledge rather than a judgement tool.

1. **Some/None:** No idea or unsure, insecure knowledge. Need to look it up or refresh knowledge Know the rules but need to refresh knowledge/skills
2. **I know and can do:** Quickly recall, answer exam style questions without a prompt. Know the key information, meanings and have the knowledge
3. **I understand and can explain:** Focus on teaching: Can explain how and why to someone else. Can use analogies, models or similar. Can link prior knowledge and next development stages. Understands the progression in a topic
4. **I can help others to learn:** Focus on individual learning and understanding: Can interconnect and link to other topics. Use relevance and everyday applications to motivate. Anticipate problems and difficulties through use of common misconceptions and other strategies. Understand conceptual structure. Deconstruct learning into manageable chunks. Enable meta-cognition

## Initial Skills Audit

|  |  | **Tags** | **Links** | **Working Level (optional a few words describing evidence of why you think are at this level)** |
| --- | --- | --- | --- | --- |
| 0 | Representing algorithmsTrace algorithm and determine purpose. Decompose problem. Pseudocode. Flowcharts | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Representing_algorithms)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=17) |  |
| 1 | Efficiency of algorithmsO(n) | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Efficiency_of_algorithms)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=) |  |
| 2 | Searching algorithmslinear, binary | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Searching_algorithms)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=18) |  |
| 3 | Sorting algorithmsbubble, merge, insertion | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Sorting_algorithms)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=18) |  |
| 4 | Data typesconvert between data types | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Data_types)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=20) |  |
| 5 | Programming conceptsnested iteration | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Programming_concepts)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=20) |  |
| 6 | Arithmetic operations in a programming languagemodulo | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Arithmetic_operations_in_a_programming_language)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=19) |  |
| 7 | Relational operations in a programming language | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Relational_operations_in_a_programming_language)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=19) |  |
| 8 | Boolean operations in a programming language | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Boolean_operations_in_a_programming_language)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=19) |  |
| 9 | Data structures2d array, object/record/struct/dictionary/data-class | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Data_structures)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=20) |  |
| 10 | Input output | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Input_output)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=) |  |
| 11 | String handling operations in a programming languagesubstring, ascii | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=20) |  |
| 12 | Random number generation in a programming language | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Random_number_generation_in_a_programming_language)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=20) |  |
| 13 | Structured programming and subroutines procedures and functionsfunctions with multiple parameters, local variable scope | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Structured_programming_and_subroutines_procedures_and_functions)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=20) |  |
| 14 | Robust and secure programmingvalidation, test-data, syntax-vs-logic error | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Robust_and_secure_programming)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=21) |  |
| 15 | Number bases | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=) |  |
| 16 | Converting between number basesconvert between binary, hex, dec | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Converting_between_number_bases)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=10) |  |
| 17 | Units of informationbyte, kilobyte, kibi | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=10) |  |
| 18 | Binary arithmeticadd 3 numbers, shift | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Binary_arithmetic)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=) |  |
| 19 | Character encodingascii, utf8 | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Character_encoding)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=11) |  |
| 20 | Representing imagescalculate bitmap size in bytes | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Representing_images)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=11)[nc](https://www.gov.uk/government/publications/national-curriculum-in-england-computing-programmes-of-study/national-curriculum-in-england-computing-programmes-of-study#key-stage-3) |  |
| 21 | Representing soundcalculate wav size in bytes | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Representing_sound)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=11) |  |
| 22 | Data compressionrle, huffman tree, lossy/lossless | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=11) |  |
| 23 | Hardware and software | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Hardware_and_software)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=) |  |
| 24 | Boolean logiclogic gates to algebra, xor | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Boolean_logic)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=22)[nc](https://www.gov.uk/government/publications/national-curriculum-in-england-computing-programmes-of-study/national-curriculum-in-england-computing-programmes-of-study#key-stage-3) |  |
| 25 | Software classificationsystem, application, operating system (user management, file systems) | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Software_classification)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=15) |  |
| 26 | Classification of programming languages and translatorsinterpreter, compiler, assembler, machine code, IDE's | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Classification_of_programming_languages_and_translators)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=23) |  |
| 27 | Systems architecturefetch execute cycle, volatile/non-volatile storage | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Systems_architecture)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=8)[ocr\_more](http://localhost:8000/9) |  |
| 28 | Fundamentals of computer networksnetwork topologies, tcp, udp, http(s), smtp, mac-address (link layer), dns | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=12)[ocr\_more](http://localhost:8000/13) |  |
| 29 | Fundamentals of cyber security | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Fundamentals of cyber security)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=) |  |
| 30 | Cyber security threatsDOS, pen-test, Social\_engineering, phishing, Malicious\_code\_malware | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Cyber_security_threats)[aqa\_more](http://localhost:8000/Social_engineering%2C%20Malicious_code_malware)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=14) |  |
| 31 | Methods to detect and prevent cyber security threatsbiometric, 2 factor | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Methods_to_detect_and_prevent_cyber_security_threats)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=) |  |
| 32 | Relational databasestable, record, primary-key, SELECT, FROM, WHERE, ORDER BY, INSERT INTO, UPDATE | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Relational_databases)[aqa\_more](http://localhost:8000/Structured_query_language_SQL)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=20) |  |
| 33 | Ethical, legal, social, privacycloud, wearables, cookies, data protection, copyright, open source | gcse | [aqa](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8525/subject-content#Ethical_legal_and_environmental_impacts_of_digital_technology_on_wider_society_including_issues_of_privacy)[ocr](https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf#page=16) |  |
| 34 | SpreadsheetVLOOKUP, Conditional Formatting, Absolute cell referencing | ict |  |  |
| 35 | AnimationTween, Keyframe | iMedia | [ocr\_imedia](https://www.ocr.org.uk/Images/115888-specification.pdf#page=26) |  |
| 36 | Creating a digital video sequenceRecord and instructional video for a class | iMedia | [ocr\_imedia](https://www.ocr.org.uk/Images/115888-specification.pdf#page=34) |  |
| 37 | Styles/Master/TemplateSlide Master, Document Styles, TOC | ict |  |  |
| 38 | Web/HTMLh1, table, ul, a, css | iMedia | [ocr\_imedia](https://www.ocr.org.uk/Images/115888-specification.pdf#page=23) |  |
| 39 | PhysicalMicrobit, Arduino, LegoMindstorms, other. Use of sensors and upload to physical device | physical | [Microbit](https://microbit.org/) |  |
| 40 | Train an AI Image classifier | digital-literacy | [google](https://teachablemachine.withgoogle.com)[raspberrypi](https://www.raspberrypi.org/blog/ai-education-resources-what-to-teach-seame-framework/) |  |
| 41 | AI Prompt engineering | digital-literacy |  |  |
| 42 | Pair ProgrammingCo-ordinate, guide, scaffold, a pair programming as part of teaching a topic | pedagogycomputing | [teacherEducation](https://github.com/calaldees/teacherEducation/blob/main/teacherEducation/pairProgramming.md) |  |
| 43 | Debuggerbreakpoint, step-over, step-into, watch variables | computing |  |  |
| 44 | Automated TestsTests give students feedback on progress. Student constructing their own assertions and verifying these | pedagogycomputing | [teacherEducation](https://github.com/calaldees/teacherEducation/blob/main/teacherEducation/automated_tests.md) |  |
| 45 | EU Digital Competence FrameworkConsider how your students skills map to external competency frameworks | digital-literacyframework | [eu](https://joint-research-centre.ec.europa.eu/digcomp/digcomp-framework_en) |  |
| 46 | NCCE: Computing Quality FrameworkFramework for inspecting and grading a schools computing provision | framework | [NCCE](https://computingqualityframework.org/overview/pdf-version/) |  |
| 47 | HCI design principles | digital-literacy | [iDEA](https://idea.org.uk/badge/ux) |  |
| 48 | gov.uk Education for a connected worldeSafety, Cyber awareness, Digital Citizenship. Age appropriate benchmark statements | digital-literacyframework | [gov.uk](https://www.gov.uk/government/publications/education-for-a-connected-world)[projectevolve](https://projectevolve.co.uk/) |  |
| 49 | File OrganisationNaming your documents. Use of folders. Backing up and restoring your data. Where is your data? (in memory?, on ssd? on usb? on the cloud? which country?) | ictdigital-literacy |  |  |
| 50 | HotkeysWindows accessibility, window arrangement, undo, select-all, copy/paste, triple click, move tabs, screenshot | digital-literacy |  |  |
| 51 | Touch TypingTyping Speed + fluent use of keyboard. Students can't trial ideas and be creative with a device if they spend 7 minuets typing in one line of text using a single finger and looking for each letter on the keyboard individually. (some school have 10min of this as a starter of every year 7 and 8 lesson). | digital-literacy |  |  |
| 52 | IDEautoformatter, auto-complete, run/debug cycle, hotkeys, find-uses, ctrl+click goto definition | digital-literacycomputing |  |  |
| 53 | Multiple Desktop Operating System user paradigmsLinux, Windows, Mac (cultural capital). differences Hotkeys, privacy, storage, drivers | digital-literacy |  |  |
| 54 | Command Linedo an operation in gui and commandline. Download youtube downloaded? encode a video? compress a folder? flags | digital-literacycomputing |  |  |
| 55 | File format extensions/mime-typespdf? doc? jpg? csv? | digital-literacy |  |  |
| 56 | Document format conversionconvert a document to other file format. What is lost/damaged? (docx,odt) (xlsx,csv) pandoc? | digital-literacyictcomputing |  |  |
| 57 | Version Controlgit?, diff(+,-,context), history, branch, merge | computing |  |  |
| 58 | Document HistorySee a documents version history. see previous versions of a document. who changed them? compare changes? | digital-literacy |  |  |
| 59 | Interesting hardware peripheralskeylogger, magnetic strip reader, smartcard reader, mini thermal printer, ultraleap, barcode reader, rf reader | digital-literacyphysical |  |  |
| 60 | markdownheadings, bullets, code blocks, tables, images, see mermaid and `Remark` |  |  |  |
| 61 | mermaiddiagram notation |  | [mermaid.js.org](https://mermaid.js.org/intro/n00b-gettingStarted.html) |  |
| 62 | wiki/knowlege-basenon linear web of linked concepts. hashtags, backreferences, search plain text (maybe with commandline grep?) | digital-literacy |  |  |
| 63 | APIUse an api to get/post data. Understand json data structures. | digital-literacycomputing |  |  |
| 64 | Task AutomationAutomate a task. macros? commandline-script? no-code? (IDEA course example send text when leave house). Think of more | computingictdigital-literacy | [iDEA](https://idea.org.uk/badge/automation) |  |
| 65 | GDPRTerminology, rights as a data subject | digital-literacy | [iDEA](https://idea.org.uk/badge/gdpr) |  |
| 66 | emailSetup rules and forwarding, signatures, cc and bcc, replying inline `>` | ictdigital-literacy |  |  |
| 67 | Printerpreview, duplex, 2 to a page, margins, headers/footers, printing tables | ictdigital-literacyphysical |  |  |
| 68 | 3D Printer + 3D ModelPrint a 3D model. Simple creation and modification of a 3D model | physicalict |  |  |
| 69 | UnrealEngine: BlueprintsA practical alternate paradigm for writing logic. 2d linked components | computing | [UnrealEngine](https://dev.epicgames.com/community/learning/courses/QGD/unreal-engine-blueprint-essential-concepts/P7L/unreal-engine-introduction-to-blueprint-essential-concepts) |  |
| 70 | Network SimulatorUse a network simulator to make networking more practical than theoretical | pedagogycomputing | [cs4g](https://netsim.erinn.io/)[code.org](https://studio.code.org/s/netsim/)[ncce](https://teachcomputing.org/curriculum/key-stage-4/networks)[HelloWorld](https://helloworld.raspberrypi.org/articles/HW8-make-networks-interesting-with-filius) |  |
| 71 | Domain nameUnderstand the process of registering a domain name and hosting a service. DNS Record A, AAAA, MX. Mail forwarding? | computingdigital-literacy |  |  |
| 72 | Judging Quality of InformationFakeNews, DeepFakes, Quality/Credibility of information | digital-literacy | [iDEA](https://idea.org.uk/badge/fake-news)[iDEA2](https://idea.org.uk/badge/fake-news-detector)[nc](https://www.gov.uk/government/publications/national-curriculum-in-england-computing-programmes-of-study/national-curriculum-in-england-computing-programmes-of-study#key-stage-3) |  |
| 73 | CareersBreath of digital careers. Bioinformatics, Social media co-ordination, AI Prompt Engineer, Dev-Ops, Embedded systems, VR, IoT, Data Science, Data Visualisation, more! | digital-literacy | [iDEA](https://idea.org.uk/badge/digital-careers) |  |
| 74 | Draw a graph/visualisation from a dataset | ictcomputing | [iDEA](https://idea.org.uk/badge/data-visualisation)[nc](https://www.gov.uk/government/publications/national-curriculum-in-england-computing-programmes-of-study/national-curriculum-in-england-computing-programmes-of-study#key-stage-3) |  |
| 75 | Draw geometric shapes with recursionRecursive tree | computing |  |  |
| 76 | Advanced Web Search: AND, OR, NOT, Date, Location | ict | [nc](https://www.gov.uk/government/publications/national-curriculum-in-england-computing-programmes-of-study/national-curriculum-in-england-computing-programmes-of-study#key-stage-3) |  |

## Additional Subject Skills

Describe any additional experience/understanding you have related to the discipline of computing: