

Meaningful Learning Experiences

Strategic Commitment	✓	Part of a careers initiative across Greater Manchester
Curriculum Provision	✓	Preparing students for a GCSE programming project
Employer Partnerships	✓	Involving a local one-man IT consultancy
Reflective Young People	✓	Students could learn from expert feedback
Informed Career Choices	✓	Describing flexible working patterns of self-employment

Local IT expert provides programming tips for GCSE Computer Science students

The head of Computer Sciences at St Catherine's Academy in Bolton identified a scheme of work in which GCSE students are given programming tasks in Scratch, Python and HTML languages. Her aim was to, *'Enable and inspire all students to participate in the digital world'* and *'Building a community of digital leaders in order to remove the current barriers to learning in digital skills required for Computer Science.'*

Students heard about a specialist IT business called Cubic Mushroom that was run by an experienced consultant who described how he *'... graduated from Manchester University with a BEng in Electronic Engineering, ending up working for IBM as a helpdesk analyst, where I discovered an interest in computers'* and now *'My business is focused on developing software and other web tools for people who make a difference in the world. I've worked with clients such as Microsoft and AgeUK to promote learning, research, and access to information in ways that are clear and easy to use'* and *'Whilst I have an office at MediaCity, where I'm surrounded by inspiring, innovative people, I tend to work from home, the odd coffee shop, or wherever my travels take me each week, as almost everything I do can be done remotely, online.'*

Students set a Python programming task to create a customer help desk solution and they were told that examples of their programming scripts would be sent to the consultant, who would, *'Provide some expert tips and feedback about your work when you have completed the task.'*

Benefits for the Students

- *'We're learning about it and he knows pretty much everything about it.'*
- *'They're successful because they know what they're doing and have accomplished a lot more, whereas a teacher is there to help you. This person has a job to do and run a company.'*
- *I'd want to ask '... how he started the business and tips for improving your knowledge.'*
- *Hearing from experts helps me to '... it would help me understand if it's something I'd like to pursue.'*

Benefits for the School

'That is fantastic thank you so much for taking the time out to give individual feedback to the students and suggesting things they can implement to further improve their code to make it more efficient. I am always telling the students that programming is frustrating and they have to persevere with it to get results so I am glad you have reiterated that from an experts point of view. I hope this will make them more resilient when working on their NEA project.'

Benefits for the Employer

Cubic Mushroom was set up and run as a one-man IT consultancy. Understandably, he was unable to commit to come into the school, either to talk about his business or to provide feedback. Added to this, his wife gave birth to their first child in the middle of the project. Nonetheless, he was able to provide input and guidance by email and phone calls, helping to motivate the group of GCSE students.

2d. Content for the Programming Project

The Programming Project provides an opportunity for learners to demonstrate their practical ability in the skills outlined in the specification, supporting the learning of Components 01 and 02. We have provided a cross mapping grid in Section 2f to highlight where Component 01 and 02 may be delivered holistically as part of the Programming Project.

There must be clear evidence submitted to show that each learner has received 20 hours of timetabled delivery for the Programming Project.

The Programming Project requires learners to use skills from Component 01 and Component 02 to create a solution to a set problem. They will code their solution in a suitable programming language. The solution must be tested to ensure they solve the stated problem. Learners must create a suitable test plan with appropriate test data.

The code must be suitably annotated to describe the process. Test results should be annotated to show how these relate to the code, the test plan and the original problem.

Learners will need to provide an evaluation of their solution based on the test evidence.

Learners should be encouraged to be innovative and creative in how they solve the task.

Learners must use a suitable high-level text-based programming language such as:

- Python
- C family of languages (for example C#, C++, etc.)
- Java
- JavaScript
- Visual Basic/.Net
- PHP
- Delphi
- BASIC.

Computational thinking is in essence the ability to model problems in a manner that makes them amenable to computational solutions; it is not simply instructions and actions. Computational thinkers are able to see algorithms, processes and data and know how to then implement them in their chosen language.

Students working on the Programming Project part of the Computer Science GCSE specification were told that a selection of their work would be sent to local IT consultancy Cubic Mushroom to receive some expert tips. They also heard about his qualifications, career history and flexible working arrangements.

Software Development

"I work from many places. Whilst I have an office at MediaCity, where I'm surrounded by inspiring, innovative people, I tend to work from home, the odd coffee shop, or wherever my travels take me each week, as almost everything I do can be done remotely, online."

MediaCityUK



Boilton St Catherine's Academy

