# Network of Teaching Excellence in Computer Science

## How the computer works/Low-level programming - an introduction

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| Objectives | * + understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems   + understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits   The areas covered in the Teaching Agency Matrix of Subject Knowledge needed are: **C1, C2, C11, C12, P16**  See <http://www.computingatschool.org.uk/data/uploads/CSSubjectKnowledgeRequirements.pdf> for more information |
| Target audience | Teachers of KS3 - KS4  No programming knowledge is needed |
| Structure of day |  |
| Session 1  9:45 - 11:15 | What is a computer? - activity    What’s inside? - practical  A simple view of how the computer works - role play exercise |
| 11:15 | Coffee/tea break |
| Session 2  11:30 - 12:45 | The Little Man Computer - introduction to the paradigm |
| 12:45 | Lunch |
| Session 3  13:30 - 14:30 | Using the Little Man Computer Simulator - exercises in low-level programming |
| 14:30 | Coffee/tea break |
| Session 4  14:45 – 15:45 | High-level and low level programs (HLL and LMC simulator) |
| 15:45 | Evaluation and end of day |
| Resources provided | Powerpoint presentation  Teacher Notes  Activity sheets for exercises |
| Resources you will need to provide | Computers (afternoon only) + internet connection  Projector  Little Man Computer Simulator (use Rivens Java applet in preference to Atkinson version)  Old computers to take apart OR hardware such as processors, memory chips |
| Alternative activities | Fetch Execute Cycle activity (attached) - role play to give teachers an understanding beyond GCSE |