

# **K-6 Outreach Using “Computer Science Unplugged”**

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## **Tutorial Presentation**

### **ABSTRACT**

The Computer Science discipline continues to struggle with low enrollment. To reverse this trend we need to engage students in the excitement of this field as early as possible in their educational careers. To this end, a series of activities aimed towards grade school children has been developed by Tim Bell, et. al. of the University of Christchurch, New Zealand. Known collectively as “Computer Science Unplugged” ([csunplugged.org](http://csunplugged.org)), these activities illustrate the fundamentals of computer science without requiring a computer or any other equipment beyond paper, pencils, cards, string, chalk, whiteboard markers, balls or similar common-place items. By eliminating the details of particular computer systems, the great ideas behind computer science can be brought into the open.

These activities demonstrate some of the key concepts of computing such as data encoding, data compression, error detection, sorting, routing and deadlock, intractability, cryptography and artificial intelligence. The activities are structured to allow students to discover answers for themselves, rather than just being given solutions or algorithms to follow. These modules can be freely downloaded and have been used and refined over 15 years around the world. The activities are stand-alone modules, so they can be used independently for enrichment in curricula, or as a series.

This tutorial will describe the basic philosophy of Computer Science Unplugged. We will briefly outline several of these activities and then the participants will actually perform several other activities so that they can actually engage in the active learning process. Finally, the tutorial will conclude with a summary of the presenter’s experience bringing these activities into an elementary school and some of the implementation issues that arise.

### **BIOGRAPHY**

Dr. Lucas received her Ph.D. in Computer Science from Princeton University and has taught Computer Science at The College at Brockport, State University of New York for the past 19 years. She teaches a range of courses that includes Introductory CS, Algorithms and Data Structures, Theory of Computation, and Social Aspects of Technology. She participated in organizing and presenting one-day ACM Teacher Enrichment in Computer Science workshops to local K-12 teachers in 2006 and 2007.