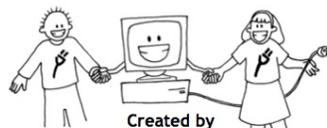




# Computer Science Unplugged

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# Computer Science Unplugged



Created by  
Tim Bell, Ian H. Witten and Mike Fellows



Adapted for classroom use by  
Robyn Adams and Jane McKenzie

- CS Unplugged is a book of activities that illustrate computer science principles without using a computer.
- Activities are short and are designed to be easily integrated into classes and include exercises and lesson plans for teachers.

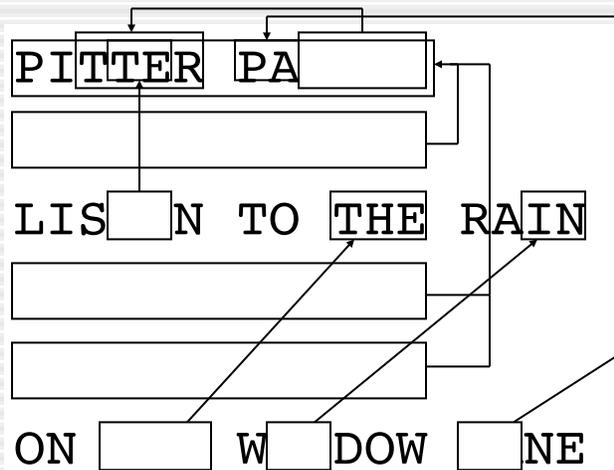
## YOU CAN SAY THAT AGAIN!

- Since computers only have a limited amount of space to hold information, they need to represent information as efficiently as possible. This is called compression.
- By coding data before it is stored, and decoding it when it is retrieved, the computer can store more data, or send it faster through the Internet.
- This exercise illustrates how a children's rhyme can be compressed.

## YOU CAN SAY THAT AGAIN!

PITTER PATTER  
PITTER PATTER  
LISTEN TO THE RAIN  
PITTER PATTER  
PITTER PATTER  
ON THE WINDOW PANE

## YOU CAN SAY THAT AGAIN!

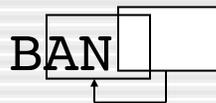


BEFORE:  
78 letters

AFTER:  
29 letters

## YOU CAN SAY THAT AGAIN!

- The arrows and boxes are presented with 2 numbers.
- PITTER PA(7,4)
  - 7: count back 7 positions
  - 4: copy 4 letters/spaces
- Sometimes boxes point back to a box with a blank inside.



## TWENTY GUESSES

- How much information is there in a 1000-page book? Is there more information in a 1000-page telephone book, or in Tolkien's *Lord of the Rings*?
  - If we can measure this, we can estimate how much space is needed to store the information.
- This activity introduces a way of measuring information content.

## TWENTY GUESSES

- Can you read the following sentence?

`Ths sntnc hs th vwls mssng.`

- You probably can, because there is not much "information" in the vowels.



## LIGHTEST & HEAVIEST

- Computers are often used to put lists into some sort of order (e.g. names into alphabetical order, appointments or e-mail by date, etc.)
  - If you use the wrong method, it can take a long time to sort a large list into order, even on a fast computer.
- In this activity children will discover different methods for sorting, and see how a clever method can perform the task much more quickly than a simple one.

## BEAT THE CLOCK

- This activity illustrates structures used in parallel sorting networks.
- Kids sort data by walking through a sorting network laid out on the floor.
- The network simulates how a parallel network would sort data.
  - Kids find out that data can be sorted a lot faster in parallel!

# BEAT THE CLOCK

