

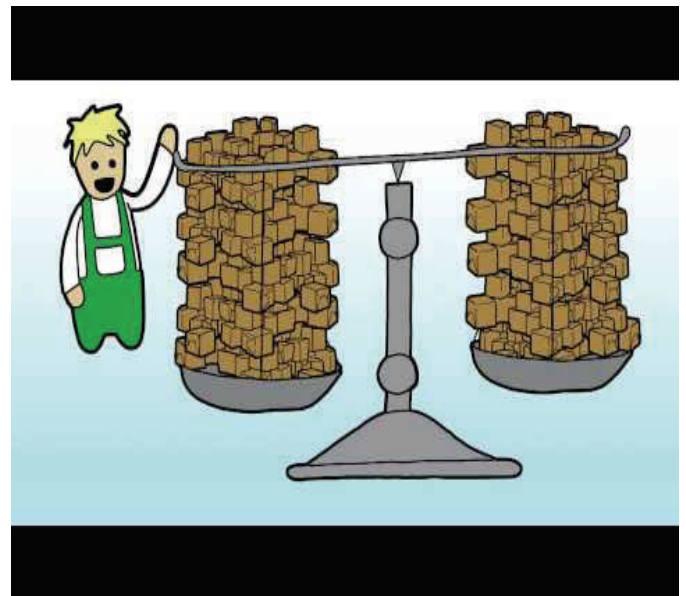
## Supporting Material for Teachers

9/5/2012

# Divide-and-conquer method

### The method

Divide and Conquer (D&C) is an important algorithm design paradigm based on multi-branched recursion. A divide and conquer algorithm works by recursively breaking down a problem into two or more sub-problems of the same (or related) type, until these become simple enough to be solved directly. The solutions to the sub-problems are then combined to give a solution



to the original problem.

This technique is the basis of efficient algorithms for all kinds of

problems, such as sorting (e.g., quick sort, merge sort)

### It operates as follows;

- **Divide:** Partition the  $n$ -element sequence to be sorted into two subsequences of  $n/2$  elements each.
- **Conquer:** Sort the two subsequences recursively using the mergesort.
- **Merge:** Merge the two sorted subsequences of size  $n/2$  each to produce the sorted sequence consisting of  $n$  elements.