Teaching More by Teaching Less

John Mason  
ATM London 2015

|  |  |
| --- | --- |
| *Marbles*  If John gives one of his marbles to Chris, they will then have the same number of marbles.  If John gives three of his marbles to Anne and Anne gives two of her marbles to Kate, they will all then have the same number of marbles.  If John gives two of his marbles to Quentin, then Quentin will have twice as many marbles as John then has. | *Syndrome*  The results of a medical test show that 10% of the population exhibit a particular characteristic but 40% of the people who develop a particular syndrome also exhibit that characteristic. This means that people with that characteristic are 6 times as likely to develop the syndrome as people not exhibiting that characteristic. |
| *Bags*  Put coloured objects into four bags such that for each pair of bags, there is just one colour for which the total number of that colour in the two bags is 3. | *Differences*  I have been given two numbers and I am to subtract the second from the first.  Just before I start, someone adds 2 to both of my numbers. What difference will that make?  What if they add 2 to the first number and subtract 1 from the second: what difference will that make? |
| *Water Loss*  40% of the nation’s water leaks out of the system. A company is about to build a new reservoir and a representative says on the radio: “We need to make it 40% bigger than we estimated in order to cover for the waste.”  You might like to know that 1/3 of London water leaks away and 17% of leaks are on private property. | |

|  |  |
| --- | --- |
| Some Powers Imagining & Expressing  Specialising & Generalising  Conjecturing & Convincing  Re-Presenting (in different modes)  Organising & Classifying | Some Themes Doing & Undoing  Invariance in the midst of change (what is the same and what is different?)  Freedom & Constraint  Restricting & Extending |