

IDEA 95

PROBABILITY FAIRGROUND 2

This idea follows on directly from Idea 94 and is about students collating, re-recording, analysing and interpreting the data.

Small groups of students are provided with recording sheets, each with data from one of the experiments (1, 2, 3 and 4) carried out in the previous lesson. Each group totals up the frequencies of the five outcomes, i.e. 0, 1, 2, 3 and 4, from all the sheets for one of the experiments.

The important issue is that all four experiments eventually have a single set of results to show how frequently the outcomes of 0, 1, 2, 3 and 4 occurred.

Each of the four experiments can be illustrated with a block graph and groups can analyse and interpret the information. The expected outcomes 'should' approximate to the fifth line of Pascal's Triangle, i.e. 1, 4, 6, 4, 1 and as fractional amounts this becomes: $\frac{1}{16}$, $\frac{4}{16}$, $\frac{6}{16}$, $\frac{4}{16}$ and $\frac{1}{16}$, or 0.0625, 0.25, 0.375, 0.25 and 0.0625.

This knowledge, of how the lines of Pascal's Triangle relate to probability outcomes, would be too complex for most KS3 students. However, older students in KS4 and KS5 can use such data to work on these concepts. For younger students, just to be able to see how the results are distributed, and how these can be turned into decimal values and placed on a probability line (from 0 to 1) would provide useful mathematical insights.

IDEA 96

QUIZ SHOW

This is a logical-thinking type task I have used many times and one that provokes much 'heated' debate. I was, therefore, heartened to see the same problem appear in Mark Haddon's *The Curious Incident of the Dog in the Night-time*, and readers of the book will recognize this problem.

The problem is based upon a quiz show where there are three doors. Behind one door is a marvellous prize, behind the other two doors are 'booby' prizes.

The idea works as follows:

- 1 The contestant is presented with three options to choose from.
- 2 Having made a choice the quiz show presenter then looks at the two options *not* chosen and discards one that would not have been a winner. This procedure is explained to the contestant.
- 3 The presenter then asks the contestant if s/he would like to change her/his mind and a) choose the remaining option, or b) stick with the original choice.

This is the crux point of the problem and although it seems illogical, the contestant doubles their chance of winning by changing her/his mind.

Having gone through the 'usual' heated debate about the seeming nonsense that changing one's mind doubles the possibility of winning, students could be encouraged to find ways of analysing the situation and proving how this problem works. One way is to draw a tree-diagram and consider what the different probabilities are at both stages of the procedure.