

# IDEA 97

## GUESS THE COLOUR

For this idea there are opportunities for students to work on the following:

- Comparing theoretical and experimental outcomes.
- Connecting fractions, decimal and percentages.
- Rounding results to a given number of decimal places.
- Understand how the probability of a (single) event increases as choice decreases.
- Carrying out an experiment several times means experimental data is more likely to match theoretical outcomes.

I have used this with 11- and 12-year-old students and it can easily be simplified for younger students.

Each student is given the same set of six differently coloured counters or linking cubes and asked to choose one counter/cube. I now take one counter/cube from a bag and see how many people in the class made the same choice of colour. This result is recorded in a two-way table as *Guess 1, Game 1*.

Everyone now removes this colour from their set of six, thus leaving them with five remaining colours to choose from. The procedure is repeated a further five times and each time results are recorded in the two-way table – *Guess 2, Game 1* then *Guess 3, Game 1*, etc. Clearly when there is only one colour to choose from, at guess 6, there should be a 100 per cent success rate; discussing the notion of certainty might be useful here.

Theoretically, the number of correct guesses should increase, however this may not be the case as we only have one data set. Playing a further five or so games, recording the values in the table and accumulating the number of correct outcomes from guess 1 through to guess 6 is likely to create a set of results closer to theoretical outcomes. Once a larger data set has been collated, results can be accumulated and analysed to compare experimental outcomes with theoretical outcomes.

The task, therefore, is about changing probabilities, from  $\frac{1}{6}$  (0.1667 or approximately 17%), to  $\frac{1}{5}$  (0.2 or 20%), . . . to  $\frac{1}{1}$  with students experiencing this in a practical, active way working as a whole-class group.

Having a smaller number of different colours in the original set will simplify this task.