

TWO-STAGE PROBABILITY INVESTIGATION SHARED BIRTHDAY SIMULATION

How many people on average, would you have to ask before finding that two of them share a birthday?

Q1. (Write Your Guesstimate Here) _____



Often it is necessary to perform a simulation in order to avoid the difficulty of interviewing hundreds of people. Doing a simulation also helps prevent problems of choosing non-biased random samples.

Q2. How many possible responses could people give you if you asked the question “What date is your birthday?”

A simulation requires approximately the same number of outcomes.

One method is to use a die and the random function on your calculator

Q3. If the die is rolled twice, and the first digit of the random number is taken, how many possible outcomes does this give?

Q4. Is your answer for Question 3 similar to your answer for Question 2?

Get into pairs. Roll the die. The result indicates the column to be used. Roll the die again. This indicates the row to be used. Press the random key on your calculator. Take the first digit after the decimal point and write it into the square that has been selected by the die. Continue the simulation until the same number appears twice in the one cell. Now, add the total number of observations in each of the rows. Then add up all the row totals and place this figure in the ‘Total’ cell. (If you do the same for all the columns, you should end up with the same ‘Total’.

This tells you how many times you had to do the experiment before the same number appeared in the same cell.

Cross or rub out the numbers in each cell. Record the 'Total' in your books. Repeat the simulation 10 times per group, and calculate the average (mean) number of times the experiment had to be done before the same number appeared in the same cell.

Q5. What is your group average?

This means that you would have to ask _____ people before finding that two of them share the same birthday (theoretically).

Q6. What is the class average?

Q7. Is this experiment a reasonable, though not exact, simulation of the birthday problem?

Q8. Did you find that your results were greatly different to your answer for Question 1?

Number of observations in row

First six-sided die

	1	2	3	4	5	6	
1							
2							
3							
4							
5							
6							

Number of observations in column