Birthday Paradox Worksheet

1. The probability of there being no collisions after n insertions into an m-element hash table is

$$\frac{m}{m} \times \frac{m-1}{m} \times \cdots \times \frac{m-n+1}{m} \tag{1}$$

   If $m = 12$ (number of months in a year), what is the smallest value of n for which the probability drops below $1/2$.

   $P(n) = \Pi_{i=0}^{n-1} \frac{m-i}{m}$

   $P(5) = .3819$

   $n = 5$

2. Form groups of 5-7 students and write down everyone's birth-month.

   I did this with some of my friends, here are the results:

Katherine	January
Ally	January
Lily	March
Ezana	July
Ryan	July

3. Did your group have a collision?

   We had two collisions!