1) A jar contains seven ping-pong balls, numbers 1 through 7. Two balls are drawn from the jar, and the ball drawn first is not replace before the second is drawn.
   a) What is the probability that both balls have even numbers on them?

   $P(E)=\left(\frac{3}{7}\right)\left(\frac{2}{6}\right)=\frac{6}{42}=\frac{1}{7}$

   b) What is the probability that one ball has a 5 on it?

   $P(F)=\left(\frac{6}{7}\right)\left(\frac{1}{6}\right)=\frac{6}{42}=\frac{1}{7}$

2) Assume that three playing cards are dealt from a thoroughly shuffled standard deck of cards.
   a) What is the probability that the first card is a heart?

   $P(H)=\frac{13}{52}=\frac{1}{4}$

   b) What is the probability that the second card is a heart?

   $P(H)=\frac{13}{52}=\frac{1}{4}$

   c) If the first card is accidentally turned over and seen to be a heart, what is the probably that the second card is a heart?

   $P(H)=\frac{12}{51}=\frac{4}{17}$

3) Assume that the birth rate for boys is approximately 49%. Assume further that each birth is independent of the other and that the sex of a child is a random occurrence.
   a) If a couple's first two children are boys, what is the probability that their third child will be a boy?

   $P(B)=\left(\frac{100}{100}\right)\left(\frac{100}{100}\right)\left(\frac{49}{100}\right)=\frac{49}{100}=49\ \%$

   b) What is the probability that a couple's first four children will all be girls?

   $P(G)=\left(\frac{51}{100}\right)\left(\frac{51}{100}\right)\left(\frac{51}{100}\right)\left(\frac{51}{100}\right)=6.8\%$

   c) If it is known that a couple's first two children are boys, what is the probability that all four of the couple's children are boys?

$$P(B) = \frac{\left(\frac{100}{100}\right)\left(\frac{100}{100}\right)\left(\frac{49}{100}\right)\left(\frac{49}{100}\right)}{} = 24\%$$