1. A restaurant offers its customers a three-course dinner, where they choose between two entrees, three main meals and 2 desserts. The managers find that 30% choose soup and 70% choose prawn cocktail for the entrée; 20% choose vegetarian, 50% chicken, and the rest have beef for their main meal; and 75% have sticky date pudding while the rest have apple crumble for dessert.
   a. Draw a fully labelled tree diagram showing all the possible choices
   b. What is the probability that a customer will choose the soup, chicken and sticky date pudding?
   c. if there are 210 people booked for the following week at the restaurant, how many would you expect to have the meal combination referred to in b)?

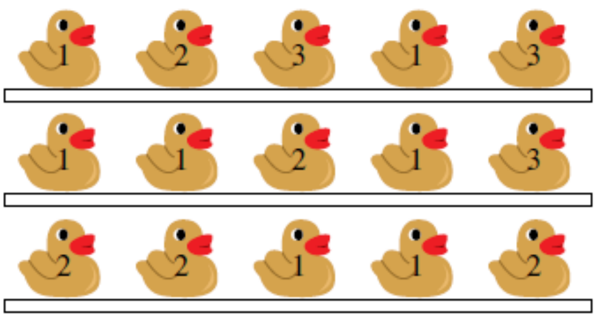
2. A bag contains 7 red and 3 white balls. A ball is taken at random, its colour noted and it is then placed back in the bag before a second ball is chosen at random and its colour noted.
   a. Show the possible outcomes with a fully labelled tree diagram.
   b. As the first ball was chosen, how many balls were in the bag?
   c. As the second ball was chosen, how many balls were in the bag?
   d. Does the probability of choosing a red or white ball change from the first selection to the second? Explain.
   e. Calculate the probability of choosing a red ball twice.
   f. Copy the following definition into your book:

*These are described as **independent events**, as the result of the first event does not affect to outcome of the next.*

   g. Suppose that after the first ball had been chosen it was not placed back in the bag. As the second ball is chosen, how many balls are in the bag?
   h. Does the probability of choosing a red or white ball change from the first selection to the second? Explain.
   i. Construct a fully labelled tree diagram to show all possible outcomes.
   j. Calculate the probability of choosing two red balls.
   k. Copy the following definition into your book:

*When one event affects the occurrence of another, the events are called **dependent events**.*

3. A game at a carnival requires blindfolded contestants to throw balls at numbered ducks sitting on 3 shelves. The game ends when 3 ducks have been knocked off the shelves. Assume that the probability of hitting each duck is equal.



   a) Are the events described in the game dependent or independent?
   b) What are the initial probabilities of hitting each number?
   c) Draw a labelled tree diagram to show the possible outcomes for a contestant.
   d) Calculate the probabilities of hitting the following:
      i. P(1, 1, 1)
      ii. P(2, 2, 2)
      iii. P(3, 3, 3)
      iv. P(at least one 3).