

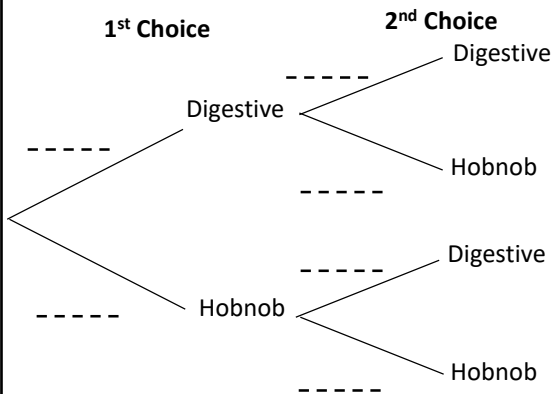


Timester Challenge



Probability Trees - Dependent Events

There is a tin of 10 biscuits in the maths office. Inside the tin there are 3 Digestive Biscuits and 7 Hobnobs. Andrea takes two biscuits at random from the tin to eat. Complete the probability tree diagram.



Work out the probability the two biscuits were **not** the same type.

Bronze ★

There are 4 black pens, 4 blue pens and 2 red pens in a pack.

Maria takes at random a pen from the pack notes the colour and gives it to a student.

Work out the probability she selects two pens the **same** colour.

Silver ★

There are n chocolates in a bag. 4 of the chocolates are mint chocolate and the rest are plain chocolate.

- Work out the probability of selecting a mint chocolate.
- Work out the probability of selecting a plain chocolate.
- Calculate the probability of randomly selecting two mint chocolates from the bag to eat.

Gold ★



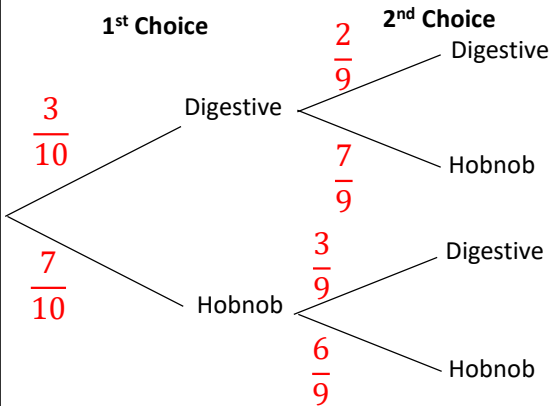
Timester Challenge

Answers



Probability Trees - Dependent Events

There is a tin of 10 biscuits in the maths office. Inside the tin there are 3 Digestive Biscuits and 7 Hobnobs. Andrea takes two biscuits at random from the tin to eat. Complete the probability tree diagram.



Work out the probability the two biscuits were **not** the same type.

$$P(\text{Not Same}) = \frac{21}{90} + \frac{21}{90} = \frac{42}{90} = \frac{7}{15}$$

Bronze ★

$$P(D, H) = \frac{3}{10} \times \frac{7}{9} = \frac{21}{90}$$

$$P(H, D) = \frac{7}{10} \times \frac{3}{9} = \frac{21}{90}$$

There are 4 black pens, 4 blue pens and 2 red pens in a pack.

Maria takes at random a pen from the pack notes the colour and gives it to a student.

Work out the probability she selects two pens the **same** colour.

$$P(\text{Black, Black}) = \frac{4}{10} \times \frac{3}{9} = \frac{12}{90}$$

$$P(\text{Blue, Blue}) = \frac{4}{10} \times \frac{3}{9} = \frac{12}{90}$$

$$P(\text{Red, Red}) = \frac{2}{10} \times \frac{1}{9} = \frac{2}{90}$$

$$P(\text{Same Colour}) = \frac{12}{90} + \frac{12}{90} + \frac{2}{90} = \frac{16}{90} = \frac{8}{45}$$

Silver ★

There are n chocolates in a bag. 4 of the chocolates are mint chocolate and the rest are plain chocolate.

a) Work out the probability of selecting a mint chocolate.

$$P(\text{Mint}) = \frac{4}{n}$$

b) Work out the probability of selecting a plain chocolate.

$$P(\text{Plain}) = \frac{n-4}{n}$$

c) Calculate the probability of randomly selecting two mint chocolates from the bag to eat.

$$P(M, M) = \frac{4}{n} \times \frac{3}{n-1} = \frac{12}{n(n-1)} = \frac{12}{n^2 - n}$$

Gold ★