

# **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.	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	<ul> <li>There are n chocolates in a bag. 4 of the chocolates are mint chocolate and the rest are plain chocolate.</li> <li>a) Work out the probability of selecting a mint chocolate.</li> </ul>
1 <sup>st</sup> Choice 2 <sup>nd</sup> Choice Digestive	Work out the probability she selects two pens the same colour.	<ul> <li>b) Work out the probability of selecting a plain chocolate.</li> </ul>
Digestive Hohpoh		<ul> <li>c) Calculate the probability of randomly selecting two mint chocolates from the bag to eat.</li> </ul>
Hobnob		
Work out the probability the two biscuits were <b>not</b> the same type. Bronze	Silver 🖈	Gold 🔶
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## Timester Challenge Answers

**Probability Trees - Dependent Events** 



#### There is a tin of 10 biscuits in the maths office. There are *n* chocolates in a bag. 4 of the chocolates are There are 4 black pens, 4 blue pens and 2 red pens in a Inside the tin there are 3 Digestive Biscuits and 7 mint chocolate and the rest are plain chocolate. pack. Hobnobs. Andrea takes two biscuits at random from the tin to eat. a) Work out the probability of selecting a mint Maria takes at random a pen from the pack notes the Complete the probability tree diagram. chocolate. colour and gives it to a student. P(Mint) = -2<sup>nd</sup> Choice 1<sup>st</sup> Choice Digestive Work out the probability she selects two pens the b) Work out the probability of selecting a plain same colour. Digestive 3 chocolate. $\overline{10}$ $P(Black, Black) = \frac{4}{10} \times \frac{3}{9} = \frac{12}{90}$ Hobnob $P(Plain) = \frac{n-4}{2}$ Digestive $P(Blue, Blue) = \frac{4}{10} \times \frac{3}{9} = \frac{12}{90}$ Calculate the probability of randomly selecting two $\overline{10}$ c) Hobnob mint chocolates from the bag to eat. $P(Red, Red) = \frac{2}{10} \times \frac{1}{9} = \frac{2}{90}$ Hobnob $P(M,M) = \frac{4}{n} \times \frac{3}{n-1}$ Work out the probability the two biscuits were **not** the same type. $P(Same \ Colour) = \frac{12}{90} + \frac{12}{90} + \frac{2}{90}$ $=\frac{12}{n(n-1)}$ $P(Not Same) = \frac{21}{90} + \frac{21}{90} P(H, D) = \frac{7}{10} \times \frac{3}{9} =$ $=\frac{16}{90}=\frac{8}{45}$ $=\frac{12}{n^2-n}$ Silver

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