

chapter

3

## Probability 2

## Section 3.5 Probability involving permutations and combinations

PROJECT MATHS  
**Text & Tests 5**  
 LEAVING CERTIFICATE  
 HIGHER LEVEL  
 STRAND 1  
 PROBABILITY & STATISTICS

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## Example 1

In Class 6A, two boys and four girls study music.

In Class 6B, four boys and six girls study music.

Two pupils are chosen at random from each of the two classes to perform at a concert.

- In how many ways can the 4 pupils be selected?
- Calculate the probability that the four chosen consist of 2 boys from 6A and 2 girls from 6B.
- Calculate the probability that the four pupils are of the same gender.

6A      6B  
 2B, 4G      4B 6G

(i) ways? 2 students from ea. :  $\binom{6}{2} \times \binom{10}{2} = 675$

(ii) ways? 2B from 6A, 2G from 6B :  $\binom{2}{2} \times \binom{6}{2} = 15$

$$P(\text{2B from 6A, 2G from 6B}) = \frac{15}{675} = \frac{1}{45}$$

(iii) ways? All boys or All girls :  $\binom{2}{2} \times \binom{4}{2} + \binom{4}{2} \times \binom{6}{2} = 6 + 90 = 96$

$$P(\text{same gender}) = \frac{96}{675} = \frac{32}{225}$$