# Exam Style Questions

## Stratified Sampling

**Corbettmaths**

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

**Guidance**

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

## Revision for this topic

www.corbettmaths.com/contents

## Video 281

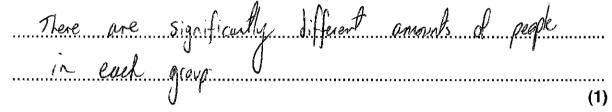1. The table shows information about the inhabitants of a village.

| Age | Population Size |
|---|---|
| 0 - 20 | 693 |
| 21 - 40 | 1203 |
| 41 - 60 | 802 |
| Over 60 | 405 |

3103

Bernard is going to carry out a survey about the local library.
He wants to find out how often people have been to the library in the last year.

Bernard decides to take a stratified sample.

(a) Explain why it is appropriate to take a stratified sample.

*There are significantly different amounts of people in each group.*

**(1)**

Bernard takes a stratified sample of 100.

(b) Calculate the number of each age group that Bernard should choose.

$$\frac{693}{3103} \times 100 = 22.33\cdots$$

$$\frac{1203}{3103} \times 100 = 38.7639\cdots$$

$$\frac{802}{3103} \times 100 = 25.84\cdots$$

$$\frac{405}{3103} \times 100 = 13.05\cdots$$

0 - 20 .......... 22 ..........

21 - 40 .......... 39 ..........

41 - 60 .......... 26 ..........

Over 60 .......... 13 ..........

**(3)**

2. There are 180 employees in a school.

The table shows the number of each type of employee in the school.

| Teachers | Teaching Assistants | Admin | Other |
|----------|---------------------|-------|-------|
| 94 | 16 | 41 | 29 |

(a) A stratified sample of size 50 is required.
   Calculate the number of each type of employee that should be chosen.

$$\frac{94}{180} \times 50 = 26.1$$

$$\frac{16}{180} \times 50 = 4.4\dots$$

$$\frac{41}{180} \times 50 = 11.388\dots$$

$$\frac{29}{180} \times 50 = 8.055\dots$$

Teachers ........26.........

Teaching Assistants ........5.........

Admin ........11.........

Other ........8.........

**(3)**

(b) Describe a method to obtain a stratified sample of size 50 from the
    employees in the school.

Assign each member of staff a number (e.g teachers 1 to 94,
Teaching assistant 95 to 110 etc) then select 26 numbers
at random from 1 to 94, 5 numbers at random from
95 to 110 and so on.

**(2)**

3. The table shows the home countries of rugby referees on a course.

| Ireland | Wales | Scotland |
|---------|-------|----------|
| 8 | 28 | 44 |

*80*

*÷ 8 =*     *1*      *3·5*       *5·5*   *divide by 8*

(a) David wants to take a stratified sample of size 10 from the referees.

Calculate the number of referees from each country that David should select.

*Ireland*  $\frac{8}{80} \times 10 = \frac{1}{10} \times 10 = 1$

*Wales*  $\frac{28}{80} \times 10 = \frac{7}{20} \times 10 = 3.5$

*Scotland*  $\frac{44}{80} \times 10 = \frac{11}{20} \times 10 = 5.5$

Ireland ......**1**........**1**....

Wales ......**4** or **3**......

Scotland ......**5**    **6**......

**(3)**

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4. There are 300 students in years 7, 8, 9 and 10 in a school.

| Year 7 | Year 8 | Year 9 | Year 10 |
|--------|--------|--------|---------|
| 72 | 108 | 66 | 54 |

*12*      *18*       *11*       *9*

A stratified sample of 50 is planned.  *divide by 6*
Calculate the number of people that should be sampled from each year group.

Year 7 ......**12**........

Year 8 ......**18**........

Year 9 ......**11**........

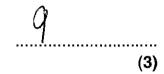Year 10 ......**9**........

**(3)**

5. Declan works in a confectioners.

He is asked to test a sample of 40 chocolates stratified by type of chocolate.
The table shows the number of each type of chocolate in the shop.

| Type | Milk | Dark | White | Total |
|---|---|---|---|---|
| Number | 600 | 220 | 130 | 950 |

Calculate the number of dark chocolates required for his stratified sample.

$$\frac{220}{950} \times 40 = 9.263\ldots$$

9

..................................................

**(3)**

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6. There are 300 passengers on a flight.

A stratified sample is taken.

The table shows some information.

| Type | Adult Male | Adult Female | Children |
|---|---|---|---|
| Number on flight | 132 | 108 | 60 |
| Number in sample | 22 | 18 | 10 |

Complete the table.

**(3)**

7.  A cricket club has 400 members.
    A stratified sample of member is taken, by age group.

    The table shows some information.

| | Junior | 18 - 39 | 40 - 59 | Senior |
|---|---|---|---|---|
| Members | 75 | ÷5 (100 | 120 | 105 |
| Number in sample | 15 | 20 | 24 | 21 |

    Complete the table.

                                                                            (3)

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8.  A teacher decides to carry out a survey about school dinners.
    She is going to ask students in year 4, year 5 and year 6.

    The numbers in the school are shown.

| Year 4 | Year 5 | Year 6 |
|---|---|---|
| 100 | 120 | 135 |

    total
    355

    A stratified sample is taken.
    40 year 4 students are selected.

    Work out the number of year 6 students selected.

    $\frac{100}{355} \times n = 40$        $\frac{135}{355} \times 142 = 54$

    $100n = 14200$

    $n = 142$

                                                    54

                                                    ..........................

                                                                            (2)