

23 (a) Max wants to take a random sample of students from his year group.

(i) Explain what is meant by a random sample.

Each of the students in his sample will have an equal chance of being chosen

(ii) Describe a method Max could use to take his random sample.

Use the Random button on the calculator Ran#  
If there are 230 students in the year group, give each a number.  
230 Ran# = ← Keep pressing and choose those people whose nos. come up

(b) The table below shows the numbers of students in 5 year groups at a school.

Year	Number of students
9	239
10	257
11	248
12	190
13	206

Lisa takes a stratified sample of 100 students by year group.

Work out the number of students from Year 9 she has in her sample

Total in 5 yr groups = ~~1140~~ <sup>1140</sup>

$$\%9 = \frac{239}{1140} \times 100 = 20.96$$

21 students

e.g. 133.4 → choose the 133<sup>rd</sup> person  
98.9 → choose the 98<sup>th</sup> person.

22. There are three secondary schools in Banley.

The table shows the number of students in each of these schools.

Adis College	Greslow High	Fripp School
750	700	900

Total = 2350

Germaine takes a sample of 50 students stratified by school.

Work out the number of students from Greslow High in the sample.

$$\begin{array}{l} \text{No. of students} \\ \text{from Greslow} \end{array} = \frac{700}{2350} \times 50 = 14.89 \dots$$

Choose 15 students

21. 258 students each study one of three languages.  
The table shows information about these students.

	Language studied		
	German	French	Spanish
Male	45	52	26
Female	25	48	62

A sample, stratified by the language studied and by gender, of 50 of the 258 students is taken.

- (a) Work out the number of male students studying Spanish in the sample.

$$\frac{26}{258} \text{ males study Spanish}$$

$$\text{In sample } \frac{26}{258} \times 50 = 5.03$$

Choose 5 students for sample  
(2)

- (b) Work out the number of female students in the sample.

$$\text{No. of Female} = 25 + 48 + 62 = 135$$

$$\frac{135}{258} \times 50 = 26.16 \dots$$

26 females in sample

21. 258 students each study one of three languages.  
The table shows information about these students.

	Language studied		
	German	French	Spanish
Male	45	52	26
Female	25	48	62

A sample, stratified by the language studied and by gender, of 50 of the 258 students is taken.

- (a) Work out the number of male students studying Spanish in the sample.

*Repeat  
Q21*

.....  
(2)

- (b) Work out the number of female students in the sample.

25.

	Male	Female
First year	399	602
Second year	252	198

The table gives information about the numbers of students in the two years of a coll course.

Anna wants to interview some of these students.

She takes a random sample of 70 students stratified by year and by gender.

Work out the number of students in the sample who are male and in the first year.

$$\text{Male and in first year} = \frac{399}{1451} \times 70 = 19.24\dots$$

19 males in first year in  
The sample of 70

4. The table below gives some information about some students in a school.

<b>Year group</b>	<b>Boys</b>	<b>Girls</b>	<b>Total</b>
Year 12	126	94	220
Year 13	77	85	162
<b>Total</b>	<b>203</b>	<b>179</b>	<b>382</b>

Andrew is going to carry out a survey of these students.

He uses a sample of 50 students, stratified by year group and gender.

Work out the number of Year 13 girls that should be in his sample.

12. People have different reaction times when using either their left hand or their right hand. Melissa wants to investigate this.

Melissa selects a number of students from her class to use as a sample for this investigation.

- (a) Give one reason why this is not a good way of taking a sample.

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(1)

- (b) Describe a better way of taking a sample that Melissa could use.

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(1)

(Total 2 marks)

25. The table shows information about the ages, in years, of 1000 teenagers.

<b>Age (years)</b>	13	14	15	16	17	18	19
<b>Number of teenagers</b>	158	180	165	141	131	115	110

Simone takes a sample of 50 of these teenagers, stratified by age.

Calculate the number of 14 year olds she should have in her sample.

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16. The table shows the number of boys and the number of girls in each year group Springfield Secondary School.

There are 500 boys and 500 girls in the school.

Year group	Number of boys	Number of girls
7	100	100
8	150	50
9	100	100
10	50	150
11	100	100
Total	500	500

Azez took a stratified sample of 50 girls, by year group.

Work out the number of Year 8 girls in his sample.

