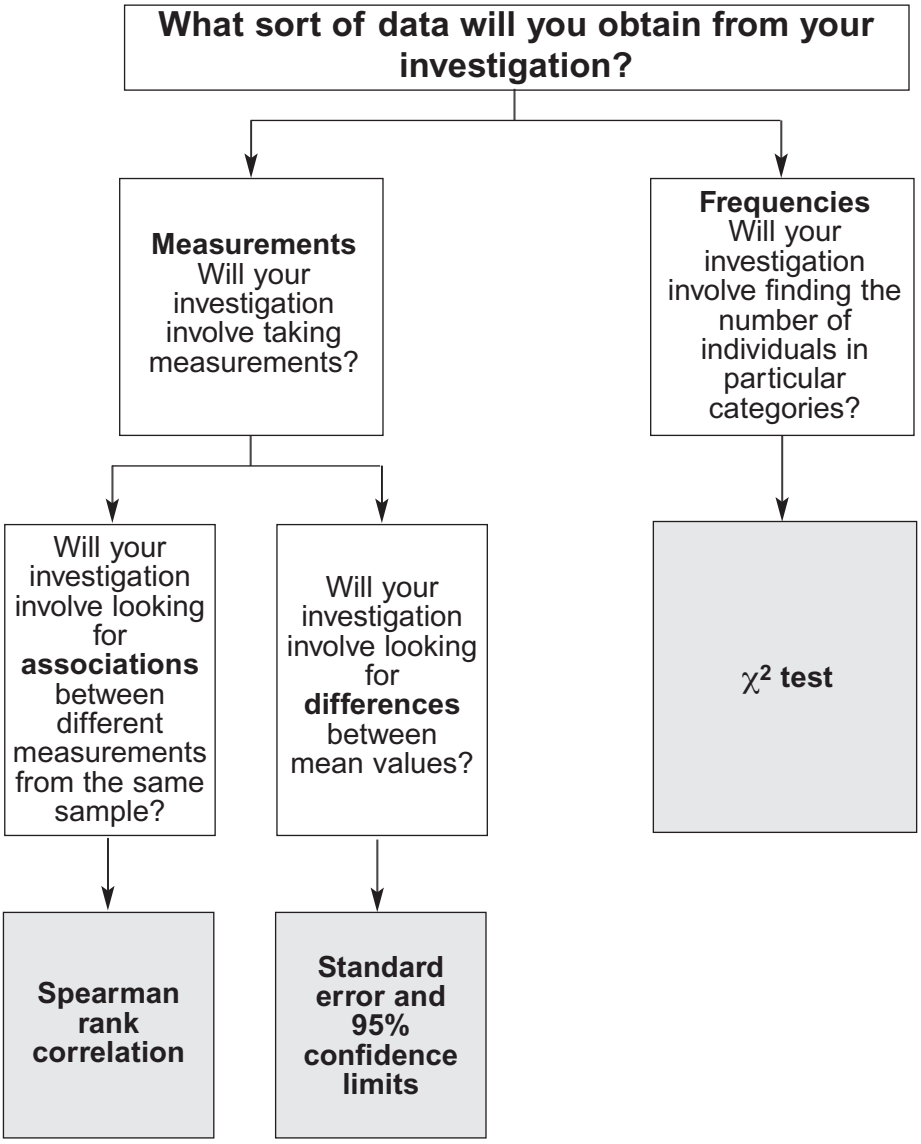
Teacher Resource Bank

GCE Biology

Students' Statistics Sheet (version 3)

AQA Students' Statistics Sheet (version 3)



Standard error and 95% confidence limits

Calculate the standard error of the mean, SE, for each sample from the following formula

$$SE = \frac{SD}{\sqrt{n}}$$

where SD = the standard deviation
and n = sample size

95% confidence limits = 2 × SE above and below the mean

For use in the ISA and EMPA assessment

Turn over ▶

The χ^2 test

The chi-square (χ^2) test is based on calculating the value of χ^2 from the equation

$$\chi^2 = \Sigma\frac{(O-E)^2}{E}$$

where O represents the results you observe in the investigation
and E represents the results you expect.

Table showing the critical values of χ^2 at P = 0.05 for different degrees of freedom

Degrees of Freedom	Critical value
1	3.84
2	5.99
3	7.82
4	9.49
5	11.07
6	12.59
7	14.07
8	15.51
9	16.92
10	18.31

Spearman rank correlation test

Calculate the value of the Spearman rank correlation, r_s, from the equation

$$r_s = 1 - \left[\frac{6 \times \Sigma D^2}{n^3 - n}\right]$$

where n is the number of pairs of items in the sample and D is the difference between each pair of ranked measurements.

Table showing the critical values of r_s at P = 0.05 for different numbers of paired values

Number of pairs of measurements	Critical value
5	1.00
6	0.89
7	0.79
8	0.74
9	0.68
10	0.65
12	0.59
14	0.54
16	0.51
18	0.48

For use in the ISA and EMPA assessment