CIE Biology International A-level

Analysis and Interpretation of Data

Flashcards

State the four statistical tests.

State the four statistical tests.

T-test

Chi-squared

Spearman's rank correlation

Pearson's linear correlation

When should a t-test be used?

When should a t-test be used?

To compare 2 means / sets of continuous, normally distributed data.

When is Pearson's linear coefficient used?

To correlate two sets of continuous, linear, and normally distributed data.

When is chi-squared test used?

When is chi-squared test used?

To compare the observed against the expected frequencies.

When is Spearman's rank coefficient used?

When is Spearman's rank coefficient used?

To correlate ordinal data, which can be ranked and is not continuous.

How are the degrees of freedom for
t-test calculated?

How are the degrees of freedom for t-test calculated?

$(n_1 - 1) + (n_2 - 1)$

How are the degrees of freedom for Pearson's linear coefficient calculated?

How are the degrees of freedom for Pearson's linear coefficient calculated?

No. of pairs of data -2

How are the degrees of freedom for chi-squared test calculated?

How are the degrees of freedom for chi-squared test calculated?

No. of categories -1

How are the degrees of freedom for Spearman's rank coefficient calculated?

How are the degrees of freedom for Spearman's rank coefficient calculated?

No. of pairs of data -2

How is a statistical conclusion written?

How is a statistical conclusion written?

State calculated value is smaller/larger than critical value at p=0.05

There is a less/more than 5% probability that the results are due to chance alone

The results are/ are not statistically significant

What does standard deviation measure?

What does standard deviation measure?

The spread of data.

What does standard error measure?

What does standard error measure?

The reliability of the sample/calculated mean.

What is the range of error bars?

What is the range of error bars?

+ / - 2 x standard error

How should graphs be analysed and described?

First, describe the overall trend seen in the graph. Then, move onto particular features of the graph eg. peaks and troughs, data that does not fit the trend. Quote data to support.

How can you show that the data is normally distributed?

How can you show that the data is normally distributed?

By drawing a frequency histogram.

What are anomalous results?

What are anomalous results?

Results that do not fit the general trend.

Why is percentage change calculated instead of actual change?

Why is percentage change calculated instead of actual change?

May not have the same starting value.

Percentage change allows comparison by showing the proportional change.

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How is rate of reaction calculated from time?

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Rate = 1/time

How is biodiversity assessed?

How is biodiversity assessed?

Using Simpson's index of biodiversity.

What does the calculated value in Simpson's Index indicate?

What does the calculated value in Simpson's Index indicate?

It is between 0 and 1.

Closer to 1 indicates higher biodiversity and closer to 0 indicates lower biodiversity.

State the formula of Simpson's Index.

State the formula of Simpson's Index.

$D = 1 - (\Sigma \, (n/N)^2)$