



Are You Golden? – Excel Help Sheet

Investigating the relationship between a person's height and the distance from their belly button to the floor.

Using the [PHIDATA.xls](#) dataset available from the *CensusAtSchool* website.

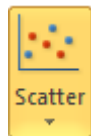
The data is in columns, with column I left blank for the Phi values. To work these out type the formula $=D2/E2$ into I2, then copy this down the column.

To work out the averages in Excel,
Mean formula = $AVERAGE(I2:I51)$
Median formula = $MEDIAN(I2:I51)$
Mode formula = $MODE(I2:I51)$

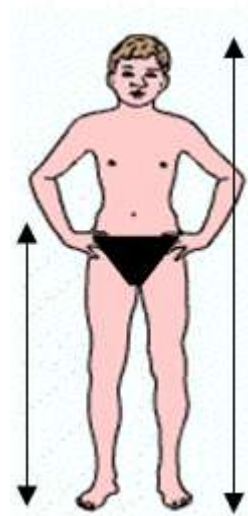
It may be good to discuss which is the best average to use in this case.

To plot the scatter graph of tummy button height against height. Highlight the two columns D and E.

Click on Scatter



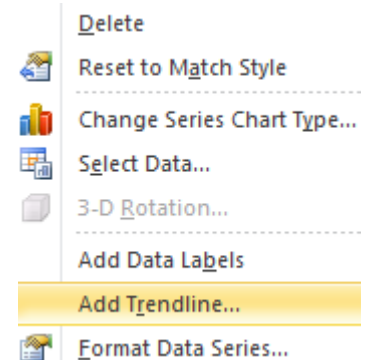
then



The scatter graph you get will look awful. You can change things such as the colours, scales, titles etc at any time by right clicking on your graph and choosing 'Chart Options' or right clicking on the very thing you want to change and choosing 'Format Axis' or 'Format Chart' area.

You can also add a trend line if you wish but should remove the obvious outliers before doing this.

To get Excel to draw box plots you will need to follow the instructions in the separate help sheet, as Excel does not do this very easily. Packages such as Autograph or Minitab will produce box plots.



Extension – The **trimmed mean** of the data can be calculated using the TRIMMEAN function in Excel. You will need to say where the data is and also what value to use 0.95 for 95%, 0.9 for 90% etc. Learners need to calculate the golden ratio for height and tummy button height in column I.

Type in the formula $=TRIMMEAN(I2:I51,0.95)$

Excel will trim off the most extreme values and find the mean of the rest. Usually a value of 95% or 0.95 is used to exclude the most extreme values, but you can investigate what happens if you reduce this and look at 90%, 75%.