**CSI AMSI Teacher notes**

The spreadsheet contains information on the Age, Gender, Cranium Circumference and Height of visitors (mainly students) to the AMSI stand at the Science Festival at Sydney Museum.

The CSI AMSI booklet explains the premise and ideas behind the task.

Students who visited the AMSI stand either took their own measurements and gave them to be entered on the spreadsheet or their measurements were taken by personnel running the stand and then entered on the spreadsheet. Students measured their height by standing with their back against a metre rule, that had been placed 1 metre from the floor and stuck to a partition wall. Students were not asked to remove their shoes. Their skull measurement was taken using a sewing tape measure. Students struggled taking skull measurements when dealing with certain hair styles. Measurements were taken to the nearest centimetre or to 1 decimal place. The accuracy of the results and how they could have been improved on could be a discussion point with students in class.

The original data and graphical representation would suit Year 11 and 12 students working on statistical analysis and linear relationships. With the regression line equation being shown and the Coefficient of Determination also indicated. Students could conduct their own survey around school, taking student and teacher measurements and compare these to the collected data. There is also a facility to compare different genders and ages. The can be done using the sort buttons on the data page. The graph will alter according the parameters selected.

**Note:** The data sheet has 367 rows of data. However, excel can only graph and calculate for the first 215 rows of data.

This investigation can be adjusted to suit the year level or ability of the students working on the task. Students could use the original data to find mean, median and mode of the three parameters. They could produce their own graphs of the data. For example, they could produce box plots comparing the heights of females and males visiting the stand. The spreadsheet will do this for students and then they could spend time commenting on the graphs.

**Discussion points:**

How could the survey be improved?

Is there a good spread of data?

Could the accuracy of measurements be improved?

Is a linear regression the best form of regression to use?

How do the results compare to other models for this type of relationship?

Are there different relationships to be found in male or female data?

The next few pages give ideas on how this activity and spreadsheet could be used to meet requirements within the Australian Curriculum -Mathematics.

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| 6 | **STATISTICS AND PROBABILITY**  | **Year 6** |  |
| 6 | Data representation and interpretation  | [Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables (ACMSP147)](http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?y=6&s=SP&layout=1) | The spreadsheet could be used to produce column graphs relating to the ages of people visiting the stand. Students could then interpret and describe these   |
| 6 | Data representation and interpretation  | [Interpret secondary data presented in digital media and elsewhere (ACMSP148)](http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?y=6&s=SP&layout=1) | Students could discuss and describe the relationships in the graphs produced.  |
| 7 | **STATISTICS AND PROBABILITY**  | **Year 7** |  |
| 7 | Data representation and interpretation  | [Construct and compare a range of data displays including stem-and-leaf plots and dot plots (ACMSP170)](http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?y=7&s=SP&layout=1) | Stem and leaf plots could be produced on the ages and genders visiting the stand.  |
| 7 | Data representation and interpretation  | [Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data (ACMSP171)](http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?y=7&s=SP&layout=1) | Students could work out the mean, median and mode for ages, skull and height measurements.  |
| 7 | Data representation and interpretation  | [Describe and interpret data displays using median, mean and range (ACMSP172)](http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?y=7&s=SP&layout=1) |  Students could then describe and interpret the statistical values they have calculated. |
| 8 | **STATISTICS AND PROBABILITY**  | **Year 8** |  |
| 8 | Data representation and interpretation  | [Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes (ACMSP206)](http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?y=8&s=SP&layout=1) |  Students could discuss and comment on the way in which the data was collected and also think about how this could be improved. |
| 8 | Data representation and interpretation  | [Investigate the effect of individual data values , including outliers, on the mean and median (ACMSP207)](http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?y=8&s=SP&layout=1) | C:\Users\dcorish\AppData\Local\Microsoft\Windows\INetCacheContent.Word\AMSI.JPG This could be done as an interactive activity using the spreadsheet and the equation tool. Students could remove or alter values to see the effect this has on the mean and median. |
| 9 | **STATISTICS AND PROBABILITY**  | **Year 9** |  |
| 9 | Data representation and interpretation  | [Identify everyday questions and issues involving at least one numerical and at least one categorical variable, and collect data directly and from secondary sources(ACMSP228)](http://www.australiancurriculum.edu.au/Mathematics/Curriculum/F-10?y=9&s=SP&layout=1) |  Using the spreadsheet and graph students could use this to think of other investigations they could carry out. |
| 9 | Data representation and interpretation  | [Construct back-to-back stem-and-leaf plots and histograms and describe data, using terms including ‘skewed’, ‘symmetric’ and ‘bi modal’ (ACMSP282)](http://www.australiancurriculum.edu.au/Mathematics/Curriculum/F-10?y=9&s=SP&layout=1http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) |  Stem and leaf plots could be produced on the ages and genders visiting the stand.  |
| 9 | Data representation and interpretation  | [Compare data displays using mean, median and range to describe and interpret numerical data sets in terms of location (centre) and spread (ACMSP283)](http://www.australiancurriculum.edu.au/Mathematics/Curriculum/F-10?y=9&s=SP&layout=1http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) |  Students could work out the mean, median and range for ages, skull and height measurements. And then interpret these results. |
| 10 | **STATISTICS AND PROBABILITY** | **Year 10** |  |
| 10 | Data representation and interpretation | [Determine quartiles and interquartile range (ACMSP248)](http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?y=10&s=SP&layout=1) |  These could be calculated from the data found on the spreadsheet. |
| 10 | Data representation and interpretation | [Construct and interpret box plots and use them to compare data sets (ACMSP249)](http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?y=10&s=SP&layout=1) |  Boxplots compare the measurements of height and or circumference could be compared for different genders. |
| 10 | Data representation and interpretation | [Compare shapes of box plots to corresponding histograms and dot plots (ACMSP250)](http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?y=10&s=SP&layout=1) |  These box plots could then be compared and interpreted. |
| 10 | Data representation and interpretation | [Use scatter plots to investigate and comment on relationships between two numerical variables (ACMSP251)](http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?y=10&s=SP&layout=1) |  The scatterplot of the height v circumference could be used for this. Students could collect their own data. |
| 10 | Data representation and interpretation | [Evaluate statistical reports in the media and other places by linking claims to displays, statistics and representative data (ACMSP253)](http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?y=10&s=SP&layout=1) | C:\Users\dcorish\AppData\Local\Microsoft\Windows\INetCacheContent.Word\AMSI.JPG Students could investigate how the results of this investigation compare to studies already carried out. |
| 10A | **STATISTICS AND PROBABILITY** | **Year 10A** |  |
| 10A | Data representation and interpretation | [Calculate and interpret the mean and standard deviation of data and use these to compare data sets (ACMSP278)](http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?y=10A&s=SP&layout=1) |  The spreadsheet will calculate these values for the collected data. Students could compare genders or age groups. |
| 10A | Data representation and interpretation | [Use information technologies to investigate bivariate numerical data sets. Where appropriate use a straight line to describe the relationship allowing for variation (ACMSP279)](http://www.australiancurriculum.edu.au/mathematics/curriculum/f-10?y=10A&s=SP&layout=1) |  The spreadsheet works well for this activity. Students could also carry out their own survey. |

