 DS5CEC Interpreting sets of data

MG1H-1 uses mathematics and statistics to evaluate and construct arguments in a range of familiar contexts

MG1H-2 analyses representations of data in order to make predictions

MG1H-7 develops and carries out simple statistical processes to answer questions posed

MG1H-9 chooses and uses appropriate technology to organise information from a range of practical and everyday contexts

MG1H-10 uses mathematical argument and reasoning to evaluate conclusions drawn from other sources, communicating a position clearly to others

| Content | Teaching Strategies | Resources |
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| Identify measures of location: mean and median | A Closer Look at Hollywood Salaries  Use an engaging data source to calculate measures of location. From this resource, students calculate the mean, median and mode of a light of highest-paid actors. (alternative data sources are available in this tool about baseball and agriculture) | Data Displayer  Teacher: <http://mths.co/3768>  Students: <http://gomaths.net/3768>  Other resources  Explore median  Teacher: <http://mths.co/1931>  Students: <http://gomaths.net/1931>  Contrasting the median and the mean  <http://bit.ly/aamtmedianmean> [AAMT]  Electronic Worksheet - Analysing Data  <http://mths.co/4193> |
| identify measures of spread: range, interquartile range and population standard deviation | Range and Interquartile Range  Use the PowerPoint to understand the need for measures of spread, e.g. Range, and introduce the Interquartile Range.  Based on this page from the ABS:  http://bit.ly/absspread | PowerPoint  ds5\_measures-of-spread.pptx  Teacher Notes: ds5\_measures-of-spread\_teacher-notes.pdf |
|  | Comparing measures of spread  “In this lesson, students compare the relative merits of the range, interquartile range and standard deviation. They calculate the standard deviation of a set of data and they investigate and describe the effect on the standard deviation of adding to or altering the scores.” | Lesson scaffold: measures\_of\_spread\_lp.doc (from Shaping Statistics in Stage 5 shaping\_stats\_s5.pdf, sourced from TaLe.  Worksheet: measures\_of\_spread\_ws.doc  Learning Object: L10576 <http://bit.ly/L10576> |
|  | Standard Deviation Investigation  “This applet allows you to interactively investigate the standard deviation as a measure of spread for a data set.” | Teacher: <http://mths.co/4104>  Students: <http://gomaths.net/4104>  (Applet requires Java) |
|  | Hollywood Salaries - Standard Deviation & Mean | Teacher: <http://mths.co/3768>  Students: <http://gomaths.net/3768> |
| Display data in double (back-to-back) stem-and-leaf plots | Back-to-back Stem-and-leaf Plots  Data from CensusAtSchool of the height of Year 11 Female and Male students is provided to be presented in a back-to-back stem-and-leaf plot. | PowerPoint: ds5\_stem-and-leaf.pptx  Worksheet: ds5\_stem-and-leaf\_ws.docx  (or ds5\_stem-and-leaf\_ws.pdf) |
|  | Investigation  Investigate the question “Do girls have faster reaction times than boys?” using a variety of graphs, including back-to-back stem-and-leaf plots. | Graph investigator: <http://bit.ly/scootleL5905> |
|  | Japanese train time table  Example of a real-life Stem-and-leaf plot.  Students could make one for a Sydney Trains line | <http://mths.co/3820> |
| Display data in two box-and-whisker plots drawn on the same scale | Box-and-Whisker Plots  Explanation and demonstration of two box-and-whisker plots drawn on the same scale. | PowerPoint  ds5\_box-and-whisker.pptx |
|  | Interactive | Braining Camp Interactive  Teacher: <http://mths.co/1932>  Students: <http://gomaths.net/1932> |
|  | **Hollywood Salaries - Box-and-Whisker Plot**  Using the same data source as previously (highest-paid actors) students can draw a box-and-whisker plot.  This tool also allows you to edit the data to investigate changes. For example, how does adjusting Tom Cruise’s earnings to 30 million dollars change the plot? | Teacher: <http://mths.co/376>  Students: <http://gomaths.net/3768> |
|  | Interpreting box plots  Observe the differences in the presentation of box plots. | AAMT Top Drawer Teachers: <http://bit.ly/aamtboxplots> |
| Display two sets of data on a radar chart |  |  |
| use multiple displays to describe and interpret the relationships between data sets | Investigate a set of data for the impact of an outlier.  “This short lesson is intended as a review of outliers and their potential effect on the mean but their lack of influence on the median.” | Lesson: Awareness of outliers, AAMT Top Drawer Teachers.  <http://topdrawer.aamt.edu.au/Statistics/Activities/Awareness-of-outliers>  Worksheet: tdt\_S\_bewareofoutliers\_student.pdf  Teacher Notes: tdt\_S\_bewareofoutliers\_teacher.pdf  Dot Plots created in GeoGebra for this activity:  <http://tube.geogebra.org/material/show/id/1464539>  Investigating Outliers - [Understanding Outliers](http://thewessens.net/ClassroomApps/Main/outliers.html?topic=probability&id=2) |
|  | Boxplot and Histogram Card Sort  A card sort activity to match box pots, histograms and summary statistics. | File: Matching cards activity.pdf  Found via [Math Equals Love](http://mathequalslove.blogspot.com.au/2015/10/boxplot-and-histogram-card-sort.html). |
| interpret data presented in two-way table form, eg male/female versus exercise/no exercise |  | An activity for Two-way tables  [Rock, Paper, Scissors and 2-Way Tables](http://mathcoachblog.com/2013/09/24/rock-paper-scissors-and-2-way-tables/) |
| compare summary statistics for two sets of data | This is covered in several of the activities above. |  |
| Investigation/assessment activities | Are males better drivers?  “In the unit of work M009021 Are Males Better Drivers? students compare the reaction times of males and females.  The worksheet requires students to use mean, median, quartiles and graphs (including box-and-whisker plots) to compare data sets selected from the Australian Bureau of Statistics' CensusAtSchool website.” | AAMT Top Drawer Teachers  <http://bit.ly/aamtdrivers>  based on a lesson from ABS  <http://bit.ly/absdrivers> |

Additional Links: [MathsLinks DS5CEC: Interpreting sets of data](http://mathslinks.net/browse/ds5cec)

Helpful References:

* [GeoGebra and Stage 5 Statistics](http://www.tale.edu.au/tale/live/teachers/shared/BC/GeoGebra_Stg5_stats.pdf) (PDF), DEC 2012. Saved as GeoGebra\_Stg5\_stats.pdf. Sourced from [TaLe](http://www.tale.edu.au/tale/components/includes/trap.html?uid=MTQzNzNAVGFMRV8yMDA1X0RFVExSTV9WMg==).
* [Statistical language](http://gomaths.net/4039), ABS
* Matching Boxplots, Histograms, & Summary Statistics - <http://rpdp.net/admin/images/uploads/resource_10066.docx>
* Beware of outliers <http://topdrawer.aamt.edu.au/Statistics/Misunderstandings/Misunderstandings-of-averages/Outliers>

Engaging sources of data:

[YouTube’s 10 most profitable channels of 2014 were, um, not what I expected](http://venturebeat.com/2015/01/02/youtubes-10-most-profitable-channels-of-2014-were-um-not-what-i-expected/)

A Google search for “youtube celebrity income” will give lots of articles like this.

Other links:

* <http://mathslinks.net/browse/ds5cec>
* [Advanced Data Grapher](http://illuminations.nctm.org/Activity.aspx?id=3476)

Sources

* AAMT = AAMT Top Drawer Teachers
* ABS = Australian Bureau of Statistics