## Part A: Evaluation of a work sample (1000 – 1200 words)

### Sample of work: Year 8 Maths Investigation

Student 15/11/11

Investigation:

DS4.2: Students learn about finding measures of location (mean, mode, median for small sets of data.

Who’s the best? Here’s the test.

Data: Beep test times

Players preform the “beep test” to determine who the fittest player is.

2008: (mean, median, mode, range.)

DS4.2: Students learn about using the range to analyse data.

14.1, 14.2, 14.2, 14.2, 14.3, 14.3, 14.4, 14.5, 14.5, 14.8

Mean = 14.4 ✓

DS4.2: Students learn to compare to sets of data by finding the mean, mode and/or median, and range of both sets *(Applying Strategies).*

Working out:

14.1+14.2+14.2+14.2+14.3+14.3+14.4+14.5+14.5+14.8

=

=14.4

Median = 14.3 ✓

Working out:

14.1, 14.2, 14.2, 14.2, 14.3, 14.3, 14.4, 14.5, 14.5, 14.8

=

= 14.3

Mode = 14.2 ✓

Working out:

14.1, 14.2, 14.2, 14.2, 14.3, 14.3, 14.4, 14.5, 14.5, 14.8

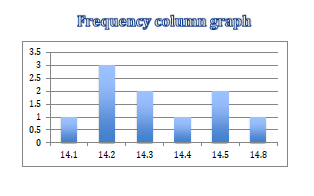
Range = 0.7 ✓

Working out:

14.1, 14.2, 14.2, 14.2, 14.3, 14.3, 14.4, 14.5, 14.5, 14.8

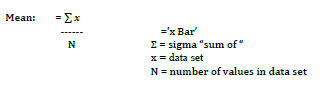
14.8-14.1= 0.7 Student 15/11/11

DS4.1: Students learn about drawing and interpreting graphs (including): dividing bar graphs.



DS4.1: Students learn about reading and interpreting tables, charts and graphs.

DS4.1: Students learn about choosing appropriate scales on the horizontal and vertical axes when drawing graphs.



2007: (mean, median, mode, range)

DS4.2: Students learn about finding measures of location (mean, mode, median for small sets of data.

14.3, 14.4, 14.5, 14.7, 14.8, 14.8, 14.9, 14.9, 15.1, 15.2

Mean = 14.8 ✓

Working out:

DS4.2: Students learn about using the range to analyse data.

14.3+14.4+14.5+14.7+14.8+14.8+14.9+14.9+15.1+15.2

=

=14.8

Median = 14.8 ✓

14.3, 14.4, 14.5, 14.7, 14.8, 14.8, 14.9, 14.9, 15.1, 15.2

=

= 14.8

Mode = 14.8 and 14.9 ✓

14.3, 14.4, 14.5, 14.7, 14.8, 14.8, 14.9, 14.9, 15.1, 15.2

Range = 0.9 ✓

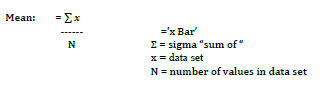
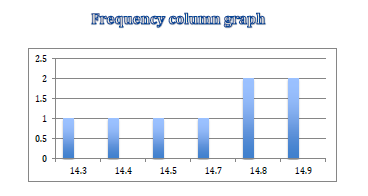
14.3, 14.4, 14.5, 14.7, 14.8, 14.8, 14.9, 14.9, 15.1, 15.2

15.2-14.3 = 0.9

DS4.1: Students learn about reading and interpreting tables, charts and graphs.

DS4.1: Students learn about choosing appropriate scales on the horizontal and vertical axes when drawing graphs.

DS4.1: Students learn about drawing and interpreting graphs (including): dividing bar graphs.



### Summary comment

This work sample shows that the student is in Band 4. There is comprehensive evidence that the student has a good grasp of the outcomes for this topic. All answers are correct and with the student showing their working for each problem, there is evidence that there is a correct train of thought developed. The methods to determine each of the median, mean, mode and range are know and used more than once. The Frequency Column graphs are created well with appropriate scales for both the vertical and horizontal axes. There is evidence that the student has learned about drawing and interpreting dividing bar graphs.

From here the student should be introduced to content from Band 5.1.

The Board of Studies New South Wales Mathematics Years 7 – 10 Syllabus states that although some students will achieve Stage 4 outcomes during Year 7, it is expected that the majority will achieve them by the end of Year 8 in 2014. This piece of student work that is being assessed is labelled as being done by a student in Year 8, and so has been evaluated using Stage 4.

The Data outcomes, knowledge and skills, and key ideas for Stage 4 are as follows:

|  |  |  |
| --- | --- | --- |
| DS4.1 | Data representation: Constructs, reads and interprets graphs, tables, charts and statistical information. | |
| **Key ideas** | Draw, read and interpret graphs (line, sector, travel, step, conversion, divided bar, dot plots and stem-and-leaf plots), tables and charts  Distinguish between types of variables used in graphs  Identify misrepresentation of data in graphs  Construct frequency tables  Draw frequency histograms and polygons | |
| **Knowledge and skills** | | **Working mathematically** |
| **Students learn about**  • drawing and interpreting graphs of the following types:  - sector graphs  - conversion graphs  - divided bar graphs  - line graphs  - step graphs  • choosing appropriate scales on the horizontal and  vertical axes when drawing graphs  • drawing and interpreting travel graphs, recognising  concepts such as change of speed and change of  direction  • using line graphs for continuous data only  • reading and interpreting tables, charts and graphs  • recognising data as quantitative (either discrete or  continuous) or categorical  • using a tally to organise data into a frequency  distribution table (class intervals to be given for  grouped data)  • drawing frequency histograms and polygons  • drawing and using dot plots  • drawing and using stem-and-leaf plots  • using the terms .cluster. and .outlier. when describing  data | | **Students learn to**  • choose appropriate forms to display data  *(Communicating)*  • write a story which matches a given travel graph  *(Communicating)*  • read and comprehend a variety of data displays used in  the media and in other school subject areas  *(Communicating)*  • interpret back-to-back stem-and-leaf plots when  comparing data sets *(Communicating)*  • analyse graphical displays to recognise features that  may cause a misleading interpretation eg displaced zero,  irregular scales *(Communicating, Reasoning)*  • compare the strengths and weaknesses of different  forms of data display *(Reasoning, Communicating)*  • interpret data displayed in a spreadsheet  *(Communicating)*  • identify when a line graph is appropriate  *(Communicating)*  • interpret the findings displayed in a graph eg the graph  shows that the heights of all children in the class are  between 140 cm and 175 cm and that most are in the  group 151.155 cm *(Communicating)*  • generate questions from information displayed in graphs  *(Questioning)* |
| **DS4.2** | **Data analysis and evaluation: Collects statistical data using either a census or a sample, and analyses data using measures of location and range** | |
| **Key ideas** | Use sampling and census  Make predictions from samples and diagrams  Analyse data using mean, mode, median and range | |
| **Knowledge and skills** | | **Working mathematically** |
| **Students learn about**  • formulating key questions to generate data for a  problem of interest  • refining key questions after a trial  • recognising the differences between a census and a  sample  • finding measures of location (mean, mode, median) for  small sets of data  • using a scientific or graphics calculator to determine the  mean of a set of scores  • using measures of location (mean, mode, median) and  the range to analyse data that is displayed in a frequency  distribution table, stem-and-leaf plot, or dot plot  • collecting data using a random process  eg numbers from a page in a phone book, or from a  random number function on a calculator  • making predictions from a sample that may apply to the  whole population  • making predictions from a scatter diagram or graph  • using spreadsheets to tabulate and graph data  • analysing categorical data eg a survey of car colours | | • work in a group to design and conduct an investigation  eg - decide on an issue  - decide whether to use a census or sample  - choose appropriate methods of presenting  questions (yes/no, tick a box, a scale of  1 to 5, open-ended, etc)  - analyse and present the data  - draw conclusions *(Questioning, Reasoning,*  *Applying Strategies, Communicating)*  • use spreadsheets, databases, statistics packages, or other  technology, to analyse collected data, present graphical  displays, and discuss ethical issues that may arise from  the data  *(Applying Strategies, Communicating, Reflecting)*  • detect bias in the selection of a sample  *(Applying Strategies)*  • consider the size of the sample when making  predictions about the population *(Applying Strategies)*  • compare two sets of data by finding the mean, mode  and/or median, and range of both sets  *(Applying Strategies)*  • recognise that summary statistics may vary from sample  to sample *(Reasoning)*  • draw conclusions based on the analysis of data (eg a  survey of the school canteen food) using the mean,  mode and/or median, and range  *(Applying Strategies, Reasoning)*  • interpret media reports and advertising that quote  various statistics eg media ratings *(Communicating)*  • question when it is more appropriate to use the mode or  median, rather than the mean, when analysing data  *(Questioning)* |