## 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

= $\frac{143.5}{10}$

=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

= $\frac{14.3+14.3}{2}$

= 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

= $\frac{147.6}{10}$

=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

= $\frac{14.8+14.8}{2}$

= 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:

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| --- | --- |
| 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 chartsDistinguish between types of variables used in graphsIdentify misrepresentation of data in graphsConstruct frequency tablesDraw 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 andvertical axes when drawing graphs • drawing and interpreting travel graphs, recognisingconcepts such as change of speed and change ofdirection • using line graphs for continuous data only • reading and interpreting tables, charts and graphs • recognising data as quantitative (either discrete orcontinuous) or categorical • using a tally to organise data into a frequencydistribution table (class intervals to be given forgrouped 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 describingdata | **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 inthe media and in other school subject areas*(Communicating)* • interpret back-to-back stem-and-leaf plots whencomparing data sets *(Communicating)* • analyse graphical displays to recognise features thatmay cause a misleading interpretation eg displaced zero,irregular scales *(Communicating, Reasoning)* • compare the strengths and weaknesses of differentforms 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 graphshows that the heights of all children in the class arebetween 140 cm and 175 cm and that most are in thegroup 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 censusMake predictions from samples and diagramsAnalyse data using mean, mode, median and range |
| **Knowledge and skills** | **Working mathematically** |
| **Students learn about** • formulating key questions to generate data for aproblem of interest • refining key questions after a trial • recognising the differences between a census and asample • finding measures of location (mean, mode, median) forsmall sets of data • using a scientific or graphics calculator to determine themean of a set of scores • using measures of location (mean, mode, median) andthe range to analyse data that is displayed in a frequencydistribution table, stem-and-leaf plot, or dot plot • collecting data using a random processeg numbers from a page in a phone book, or from arandom number function on a calculator • making predictions from a sample that may apply to thewhole 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 presentingquestions (yes/no, tick a box, a scale of1 to 5, open-ended, etc) - analyse and present the data - draw conclusions *(Questioning, Reasoning,**Applying Strategies, Communicating)*• use spreadsheets, databases, statistics packages, or othertechnology, to analyse collected data, present graphicaldisplays, and discuss ethical issues that may arise fromthe data*(Applying Strategies, Communicating, Reflecting)* • detect bias in the selection of a sample*(Applying Strategies)* • consider the size of the sample when makingpredictions about the population *(Applying Strategies)* • compare two sets of data by finding the mean, modeand/or median, and range of both sets*(Applying Strategies)* • recognise that summary statistics may vary from sampleto sample *(Reasoning)* • draw conclusions based on the analysis of data (eg asurvey of the school canteen food) using the mean,mode and/or median, and range*(Applying Strategies, Reasoning)* • interpret media reports and advertising that quotevarious statistics eg media ratings *(Communicating)* • question when it is more appropriate to use the mode ormedian, rather than the mean, when analysing data*(Questioning)* |