**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM: | WEEK:4 | STRAND: Statistics and Probability | **SUB-STRAND: Data 2** | **WORKING MATHEMATICALLY: MA3-1WM MA3-3WM** |
| OUTCOMES: MA3-18SP | **Uses appropriate methods to collect data and constructs, interprets and evaluates data displays, including dot plots, line graphs and two-way tables**  |
| **CONTENT:**  | **Interpret and compare a range of [data displays](http://syllabus.bos.nsw.edu.au/glossary/mat/data-display/?ajax" \o "Click for more information about 'data displays'" \t "_blank), including [side-by-side column graphs](http://syllabus.bos.nsw.edu.au/glossary/mat/side-by-side-column-graph/?ajax" \o "Click for more information about 'side-by-side column graphs'" \t "_blank) for two [categorical variables](http://syllabus.bos.nsw.edu.au/glossary/mat/categorical-variable/?ajax" \o "Click for more information about 'categorical variables'" \t "_blank)(ACMSP147)*** + - * Interpret and compare different displays of the same data set to determine the most appropriate display for the data set
* Compare the effectiveness of different student-created data displays (Communicating)

**Interpret [secondary data](http://syllabus.bos.nsw.edu.au/glossary/mat/secondary-data-set/?ajax" \o "Click for more information about 'secondary data'" \t "_blank) presented in digital media and elsewhere (ACMSP148)*** Interpret tables and graphs from the media and online sources, eg data about different sport teams (Reasoning)
* Identify and describe conclusions that can be drawn from a particular representation of data (Communicating, Reasoning)

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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | * **Pre Assessment**

Give the students five whole numbers as ages of your children. Ask them to find the average(mean) age of your children. Note which children know what average and/or mean refer to.Pre-assessment can also be derived from class discussions and observations of students work. |
| WARM UP / DRILL | * **Ups and Downs’ activity** The teacher provides each student with a copy of a graph that shows the movement of a lift over a period of time.
* Possible questions include: how many minutes are shown on the graph? How many floors are in the building?

What happened when the line goes up sharply? Why did the lift stop for 20 seconds?* In small groups, students discuss the graph suggesting possible explanations for the movement of the lift. Each group writes a story to match the graph, either as a narrative or as a report. Each group then shares their story with the rest of the class who discuss and comment on the interpretation.
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| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | * Consider the statement:

The mean of the five numbers is 8. Write a word problem to which this could be a solution. Show all calculations. |
| QUALITY TEACHING ELEMENTS | **INTELLECTUALQUALITY** | **QUALITY LEARNINGENVIRONMENT** | **SIGNIFICANCE** |
| * Deepknowledge
* Deepunderstanding
* Problematicknowledge
* Higher-orderthinking
* Metalanguage
* Substantivecommunication
 | * Explicit quality criteria
* Engagement
* High expectations
* Social support
* Students’ self-regulation
* Student direction
 | * Background knowledge
* Cultural knowledge
* Knowledge integration
* Inclusivity
* Connectedness
* Narrative
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| RESOURCES | [http://www.abs.gov.au/websitedbs/CaSHome.nsf/Home/CaSQ+40+SIDE+BY+SIDE+COLUMN+GRAPHS](http://www.abs.gov.au/websitedbs/CaSHome.nsf/Home/CaSQ%2B40%2BSIDE%2BBY%2BSIDE%2BCOLUMN%2BGRAPHS)<http://www.glencoe.com/sites/pdfs/impact_math/ls3_c3_two_way_tables.pdf> |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTIONMODELLED ACTIVITIES | GUIDED &INDEPENDENT ACTIVITIES |
| * Many children just have a procedural understanding of “average’ and follow a procedure to figure it out eg add up the numbers and divide by how many there are and don’t actually have a concept about what it is.We need to help the children build up a concept about what it it through practical experiences.
* Discussion about ‘What is “average” or “the mean”
* **Language**

data, represent, graph, results, symbols, vertical, horizontal, scale, many to- one, average, mean, category, predict, representation, advantages, disadvantages, key, arrangement | LEARNING SEQUENCERemediationS2 or Early S3 | * **Tell me a Story**

Students use the placement of points on a line graph that represent the changes in the depth of water, to write a story. They are provided with the completed line graph with axes marked eg time and depth of water in centimetres. Students give their graph a suitable title. Students brainstorm a checklist of events for each point on the line graph that they will include in their story and then write their story. Students share their story with the class. The class uses the checklist and the placement of points on the line graph. * Discussion about ‘What is “average” or “the mean”

Ask for four children of different height (if possible) tio come up and ask how we could find the ‘average’ or ‘mean’ using the paper tape roll. Children hopefully come to conclusion that they could measure the height of each child from head to foot with paper tape and then halve the length of paper tape and halve it again and that the quarter part of the tape is the ‘average’ * Discuss how the ‘average’ is what it would be if everyone in that group ‘was the same’ height (combining all the different heights from that group together and evening it out –take a bit of height off someone else and give to a shorter person)Children can draw a diagram showing what happened. Looking for something like below to get the meaning across.

**The light blue part is the ‘average’ of the above data 135.25 cm would be the average height.**

|  |  |  |  |
| --- | --- | --- | --- |
| 140cm  | 135cm  | 128cm  | 138cm  |
|  | **135.25cm**  |  |  |  |  |  |  |
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| LEARNING SEQUENCES3 | ***Task:**** **Mean**

Students are provided with information presented in the media that uses the term ‘average’ eg travel brochures, weather forecasts. They find the meaning of the terms ‘mean’ and ‘average’ and discuss their usage. The students discuss both words and their meanings. The students collect mean temperatures of a city and represent the data in a graph. * **Who is the Average Student?**

Students collect numerical data from other students eg number of family members, height and age. They determine the mean for each set of data.Students consider whether there is a student in the class who fits one of the three averages or all three averages. Students discuss their findings. * **Side by side column graphs**

In 2008, a total of 44,189 students completed the Census At School on line questionnaire. The numbers of participants is recorded in the table below. Click on this link to show the class the table. [http://www.abs.gov.au/websitedbs/CaSHome.nsf/Home/CaSQ+40+SIDE+BY+SIDE+COLUMN+GRAPHS](http://www.abs.gov.au/websitedbs/CaSHome.nsf/Home/CaSQ%2B40%2BSIDE%2BBY%2BSIDE%2BCOLUMN%2BGRAPHS)1. For your State or Territory, create a column for the participation at each level. Place them on the axis below next to the Australian Totals. Remember to keep the column widths the same.2. Describe how the year level participation for your State or Territory compares to the participation for Australia. 3. Students then change the total numbers of students participating into percentages.4. For your State or Territory, fill in any missing value and show the percentage participation for each year level as a column on the graph below.5. Which side by side column graph shows the comparison between your State or Territory more clearly? 6.Explain the reasons for your answer.* Complete line graphs worksheet pg 16 Targeting Maths
* Completed written work forms the assessment task.
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| LEARNING SEQUENCEExtension Early S4 | * Choose another State or Territory for comparison and add its data to the graph you nominated in question 4.
* Describe how its participation compared to your State or Territory and to Australia overall.
* Completed written and oral work from this task forms the assessment task.
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| **EVALUATION &REFLECTION** | **Student Engagement: Achievement of Outcomes:****Resources: Follow Up:** |

* All assessment tasks should be written in **red** and planning should be based around developing the skills to complete that task.
* Assessment rubrics or marking scale should be considered.