**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM: | WEEK: 1 | STRAND: STATISTICS AND PROBABILITY | **SUB-STRAND: Data 1** | **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:** | | **Pose questions and collect [categorical](http://syllabus.bos.nsw.edu.au/glossary/mat/categorical-variable/?ajax" \o "Click for more information about 'categorical'" \t "_blank) or [numerical data](http://syllabus.bos.nsw.edu.au/glossary/mat/numerical-data/?ajax" \o "Click for more information about 'numerical data'" \t "_blank) by observation or survey (ACMSP118)**   * Pose and refine questions to construct a survey to obtain categorical and numerical data about a matter of interest.   **Construct displays, including [column graphs](http://syllabus.bos.nsw.edu.au/glossary/mat/column-graph/?ajax" \o "Click for more information about 'column graphs'" \t "_blank), [dot plots](http://syllabus.bos.nsw.edu.au/glossary/mat/dot-plot/?ajax" \o "Click for more information about 'dot plots'" \t "_blank) and tables, appropriate for [data](http://syllabus.bos.nsw.edu.au/glossary/mat/data/?ajax" \o "Click for more information about 'data'" \t "_blank) type, with and without the use of digital technologies (ACMSP119)**   * Tabulate collected data, including numerical data, with and without the use of digital technologies such as spreadsheets * Choose an appropriate title to describe the data represented in a data display * Construct dot plots for numerical data, eg the number of siblings of each student in the class   **Describe and interpret different data sets in context (ACMSP120)**   * Describe and interpret data in tables, dot plot, column and line graphs, eg the heights of all students are between 125cm and 154cm * Determine the total number of data values represented in dot plots and column graphs * Identify and describe the relationships that can be observed in data displays | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | * **Worksheets 1**  The fruit that the school canteen sold on Mondays.   - Displays and interprets data in graphs with scales many-to-one correspondence.   * Pre-assessment can also be derived from class discussions and observations of students work. | | |
| WARM UP / DRILL | | * **Alphabet Hunt**   Students predict which letter of the alphabet is most frequently used. They justify their predictions and suggest how they could test their predictions. Possible questions.   * Would some letter occur more than others? Why? * Which letters would be least likely to occur? Why? * Which letter do you write most often?   The teacher gives each student a page from a text and a letter to count. The results are collated into a table and each student draws a graph to show the results. | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | * Bonnie's Pizza sells small, medium, and large pizzas. Yesterday, they sold 2 small pizzas. They sold 17 more medium pizzas than large pizzas. The medium pizzas have 10 slices each. Bonnie's Pizza sold 12 large pizzas yesterday. How many total pizzas did Bonnie's Pizza sell yesterday? | | |
| QUALITY TEACHING ELEMENTS | | **INTELLECTUALQUALITY** | **QUALITY LEARNINGENVIRONMENT** | **SIGNIFICANCE** |
| * Deep knowledge * Deep understanding * Problematic knowledge * Higher-order thinking * Metalanguage * Substantive communication | * Explicit quality criteria * Engagement * High expectations * Social support * Students’ self-regulation * Student direction | * Background knowledge * Cultural knowledge * Knowledge integration * Inclusivity * Connectedness * Narrative |
| RESOURCES | | Dice, one page from a text for every student, access to internet for students, Worksheet 1, Worksheets2 &3, Assessment 1, access to the school canteen, student’s grid books, | | |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTIONMODELLED ACTIVITIES | GUIDED &INDEPENDENT ACTIVITIES | |
| * **Explicitly communicate lesson outcomes and work quality.** * **Class discussion on** why we use tally marks to record data and what type of questions need to be asked to collect data. * **Introduce the dot plots.** Using a number line, a dot plot displays a dot for each observation. Where there is more than one observation, or observations are close in value, the dots are stacked vertically. If there is a large number of observations, dots can represent more than one observation. * **Column Graphs**. Introduce the feature of a column graph and what information best suits a column graph. Create one as a whole class. * **Provide students with other opportunities to collect information on their interests.** Discuss the importance of surveys and how they are used.   **Aspects** of a survey. Why so a survey?   1. You want to answer a question. 2. Want to make a change. 3. Make decisions. 4. Provide goods/services.   What are the **features** of a survey?   1. Purpose/Title 2. Participants. Who’s being surveyed? 3. Questions to collect data 4. How to organise data (type of graph) 5. How will the data answer your question? 6. What will you do with the results? | LEARNING SEQUENCERemediationS2 or Early S3 | * **Review the terms:** least popular, most popular, predict, dot plot, column graph, data, survey, category, display. * **Combination Dice** <http://www.mathsisfun.com/activity/dice-experiment-1.html>   Students roll two dice 30 times, add the two numbers and keep a tally of the results. The data is transferred to a column graph and the students interpret the data.  Which number came up most/least often?  Did any two numbers come up the same number of times? What were they? |
| LEARNING SEQUENCE **S3** | * **Ice-cream Magic**. Survey the class with their favourite ice-cream flavour. Create a table with tally marks representing the data. Then students convert the tallies into a dot plot. * **Mystery Graph.** Each student draws a mystery graph with no heading or labels. Students swap with a partner. Partner tries to identify an appropriate heading and label that would match the data displayed in the graph. * **Students make a graph online**<http://www.amblesideprimary.com/ambleweb/mentalmaths/grapher.html> * **Worksheet 2. Tally Marks** CDs sold in a week and farmer Blake and his boxes of mangoes. * **Worksheet 3. 43 Graphs** Spiders found in six areas and Monday sales at the local butcher. * **Make your own bar graphs** <http://www.softschools.com/math/data_analysis/bar_graph/activities/make_your_own_bar_graph/>   Investigation:   * **School Canteen survey.** Students collect daily sales of drinks, pies, iceblocks etc. Students decide on an appropriate title, scale, symbol and key 🍽= 10 for their picture graph. * **Assessment1 Graphs** Meals served at last weeks’ cafe. Interprets a picture graph using the key and draws a column graph using a scale of many to one correspondence. |
| LEARNING SEQUENCEExtensionEarly S4 | * **Research**   Ask students to construct a picture graph with a many to one correspondence based on information gathered from the internet, e.g  -car production for major brand names  -populations of major Australian cities  -price of telephone calls per minute from the school to various other places.  Ask students to suggest the advantages and disadvantages of picture graphs and keys. |
| **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.