**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM: | WEEK:5 | 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 [data](http://syllabus.bos.nsw.edu.au/glossary/mat/data/?ajax) presented in [two-way tables](http://syllabus.bos.nsw.edu.au/glossary/mat/two-way-table/?ajax) * Create a two-way table to organise data involving two categorical variables * Interpret side-by-side column graphs for two categorical variables, eg fav TV show of students in Yr 1 compared to that of students in Yr 6 * Discuss the advantages and disadvantages of different representations of the same data (Communicating) | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | * **Class discussions:**   Where have you seen a graph being used in everyday life?  How do we construct picture, column and line graphs to display the data we collect.   * Display a column graph showing ice cream flavours – Attached – and discuss the focus questions.   ATTACH PDF HERE FROM “I SAY YOU SAY DATA” PG!!  Pre-assessment can also be derived from class discussions and observations of students work. | | |
| WARM UP / DRILL | | * Watch [Data Handling: Two-way tables](https://portalsrvs.det.nsw.edu.au/f5-w-687474703a2f2f6c72727075626c69632e636c692e6465742e6e73772e6564752e6175$$/lrrSecure/Sites/LRRView/14118/14118_show2.htm?keepThis=true&TB_iframe=true&height=.htm?keepThis=true&TB_iframe=true&height=550&width=750) (embedded YouTube video—may require teacher internet login). <https://portalsrvs.det.nsw.edu.au/f5-w-687474703a2f2f6c72727075626c69632e636c692e6465742e6e73772e6564752e6175$$/lrrSecure/Sites/LRRView/14118/14118_03.htm> | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | * There are five people in a family and their average age is 20. What might their ages be? | | |
| 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 |
| RESOURCES | | <http://www.abs.gov.au/websitedbs/CaSHome.nsf/Home/CaSQ+40+SIDE+BY+SIDE+COLUMN+GRAPHS>  <http://www.glencoe.com/sites/pdfs/impact_math/ls3_c3_two_way_tables.pdf>  Examples of graphs found in print material , Side-by-side column graph http://living-expenses.com/tag/newspapers-versus-internet , Column graph  http://www.mbgnet.net/sets/tundra/facts.htm , Line graph http://blog.questionmark.com/minimizing-bias-when-assessing-across-culture-and-language | | |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTIONMODELLED ACTIVITIES | GUIDED &INDEPENDENT ACTIVITIES | |
| * **Two way table**  |  |  |  | | --- | --- | --- | | **DRINKS** | **BOYS** | **GIRLS** | | **MILK** | 5 | 6 | | **WATER** | 3 | 2 | | **JUICE** | 1 | 1 |  * **Side by side Column Graph**   A side by side column graph will have two independent variables, such as location and year. The data for each year will be grouped under one location heading. The different year's data is usually colour-coded for easy viewing.   * **Language**   data, represent, graph, results, symbols, vertical, horizontal, scale, many to- one, average, mean, category, predict, representation, advantages, disadvantages, key, arrangement   * Column graphs use vertical columns to represent frequencies or quantities that have a unit. Questions about column graphs could be the type of “how much” or :how many?” depending on what type of data is represented. * Bar graphs are column graphs where bars are horizontal * Line graphs use a series of points connected by short line segments to represent change in a quantity over time, Data for a line graph could be collected from experiments or observations of quantities that change over time Questions about line graphs would be of the type of “when was?” or “what was happening at this time?” | LEARNING SEQUENCERemediationS2 or Early S3 | * Organise the students into small groups (or pairs). Ask each group to decide on a question that it would like to collect data about. * Have the students collect their data using a tally chart. * Have each group then represent its data in column graph * Similarly represent this data in a 2 way table. * Ask each group to write at least three interesting facts about the information in its graph. * Ask each student to reflect upon the group’s question choice and record his or her reflections. * Have each group reflect on the effectiveness of each data display and discuss which is most effective * Have each group present its findings to the class. * As a class, compare the effectiveness of different data representations in communicating the data. |
| LEARNING SEQUENCES3 | * Set the students the task of collecting different types of graphs from sources such as newspapers, magazines or the internet. * Provide the students with the following headings and have them sort the graphs into groups: column graphs, line graphs, dot plots, side-by side column graphs, picture graphs, other.   As a class, construct a table to investigate the key features, advantages, disadvantages and best use of each type of graph.  Note 1: The Other category may need to be excluded from the table. Note 2: Sector graphs are within Stage 4 content.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  | Key features | Advantages | Disadvantages | Best use | | column graphs | | |  |  |  |  | | line graphs | | |  |  |  |  | | dot plots | | |  |  |  |  | | side-by side column graphs | | |  |  |  |  | | picture graphs | | |  |  |  |  |   Examples of graphs found in print material   * Side-by-side column graph   http://living-expenses.com/tag/newspapers-versus-internet   * Column graph   http://www.mbgnet.net/sets/tundra/facts.htm   * Line graph   http://blog.questionmark.com/minimizing-bias-when-assessing-across-culture-and-language  Have the students work in groups, or work as a whole class to complete the table of information.  Complete line graphs worksheet pg 37 Targeting Maths |
| LEARNING SEQUENCEExtensionEarly S4 | * Have the students investigate and present interesting facts about M&M’s confectionary. If not discovered by the students, share the following facts with them:   \* M&M's were invented in 1940. They were named after Forrest Mars and Bruce Murries, the inventors.  oFrom 1976 to 1985, there were no red M&Ms due to a banning of Red dye#2, even though M&Ms did not contain this dye. Many consumers protested and Paul Hethmon, a student at the University of Tennessee, started The Society for the Restoration and Preservation of Red M&M's. Eventually the Mars company relented and began producing red M&Ms again.  \* In 1985, focus groups were held to decide the correct proportions for each colour of M&Ms. The new proportions were 30% brown, 20% red, 20% yellow and 10% each of orange, green and tan for plain M&M's.  \* Blue M&Ms were introduced in 1995.   * As a class devise an advertising campaign focused on selecting a new colour to be added to a pack of M&Ms. Have the students nominate possible new colours for an M&M. Gain a consensus of the class’ top five choices and survey another class, or classes, to determine which would be the colour most favoured. Have the students create a column graph of the results.   References:   * • FoodReference.com, M & M candies, viewed 20 August 2012, <www.foodreference.com/html/artmandms.html>. * • FoodReference.com, M&M trivia, viewed 20 August 2012, <www.foodreference.com/html/fmandmcandy.html> |
| **EVALUATION &REFLECTION** | Reflection Time should be allowed at the end of each class lesson to revise learning outcomes shared and strategies used.  **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.