**MATHEMATICS STAGE 2**

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| TERM: | WEEK: 4 | STRAND: Statistics and Probability | **SUB-STRAND: Data 2** | **WORKING MATHEMATICALLY: MA2-18SP** |
| OUTCOMES: MA2-18SP | **Selects appropriate methods to collect data, and constructs, compares, interprets and evaluates data displays, including tables, picture graphs and column graphs** |
| **CONTENT:**  | **Select and trial methods for [data](http://syllabus.bos.nsw.edu.au/glossary/mat/data/?ajax" \o "Click for more information about 'data'" \t "_blank) collection, including survey questions and recording sheets (ACMSP095)*** Create a survey and related recording sheet, considering the appropriate organisation of categories for data collection
* Choose effective ways to collect and record data for an investigation, eg creating a survey with a scale of 1 to 5 to indicate preferences (1 = don't like, 2 = like a little, 3 = don't know, 4 = like, 5 = like a lot) (**Communicating, Problem Solving)**
* Refine survey questions as necessary after a small trial

**Construct suitable [data displays](http://syllabus.bos.nsw.edu.au/glossary/mat/data-display/?ajax" \o "Click for more information about 'data displays'" \t "_blank), with and without the use of digital technologies, from given or collected data; include tables, [column graphs](http://syllabus.bos.nsw.edu.au/glossary/mat/column-graph/?ajax" \o "Click for more information about 'column graphs'" \t "_blank) and [picture graphs](http://syllabus.bos.nsw.edu.au/glossary/mat/picture-graphs/?ajax" \o "Click for more information about 'picture graphs'" \t "_blank) where one picture can represent many data values (ACMSP096)*** Represent given or collected categorical data in tables, column graphs and picture graphs, using a scale of [many-to-one correspondence](http://syllabus.bos.nsw.edu.au/glossary/mat/many-to-one-correspondence/?ajax" \t "_blank" \o "Click for more information about 'many-to-one correspondence'), with and without the use of digital technologies.
* Discuss and determine a suitable scale of many-to-one correspondence to draw graphs for large data sets and state the key used, eg http://syllabus.bos.nsw.edu.au/assets/mathematicsk10/images/s2sp003.png = 10 people, if there are 200 data values (**Communicating, Reasoning)**

**Evaluate the effectiveness of different displays in illustrating data features, including variability (ACMSP097)*** Discuss and compare features of data displays, including considering the number and appropriateness of the categories used, eg a display with only three categories (blue, red, other) for car colour is not likely to be useful **(Communicating)**
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | * Teacher Questioning and Class discussion on:
* What is a survey?
* Who would use a survey?
* Why do we use surveys?
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| WARM UP / DRILL | Class group:* Would you rather? Teacher to pose question *“Would you rather eat McDonalds or Fruit”*(or a lopsided question like this.)
* Record the response among the class. *Which got the most votes? Why do you think this might be? How could I display the results in an easy to see format? What could the title of the survey be? What conclusions can we draw from this information?*
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| NEWMAN’S PROBLEMINVESTIGATION  | (Graph template provided) What is the most popular colour in year 4? How do you know this?  |
| 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 | Clipboards, Pencils, Mathematics Books, Rulers, Interactive Whiteboard. |

**TEACHING AND LEARNING OVERVIEW**

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| WHOLE CLASS INSTRUCTIONMODELLED ACTIVITIES | GUIDED &INDEPENDENT ACTIVITIES |
| Teacher to provide three topics for students to survey *(students choose one to maintain interest in the topic):*1. Favourite colour (Blue, Green, Pink, Red)
2. Favourite fruit (Apple, Orange, Banana, Grapes)
3. Favourite Ball Game (Soccer, Netball, Basketball, Cricket)
* **Review** tally marks during **class discussion.** What is the advantage of doing this? Why does the information become easier to read?
* Features of different **graphs.** What information can we get from a graph? Where do we need to look?
* What makes a good survey? Explicit teaching on appropriate questions that could be used in a survey setting. That is; questions that are relevant and easy for students to relate to.
* Entering the information into a graph. What do we need? **X and Y Axis, Title, Information in correct area.**
 | LEARNING SEQUENCERemediationS1 or Early S2 | * Students are given a topic to survey of their choice (see left).
* They are required to use tally marks to record the data of each option on a sheet of paper.
* Students total results and discuss why they believe the results ended up that way.
* Use the following link to introduce and follow tally marking as a class group. <http://lgfl.skoool.co.uk/content/primary/maths/data_handling/index.html>
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| LEARNING SEQUENCES2 | * Using the results from the above learning sequence, students will be required to enter this information into a column graph. (Template provided)
* When entering the information, students are shown the key parts of the graph. *Why is it important to have equal distances between totals? What would happen if they weren’t even?*
* Show students an example of a completed graph. <http://nces.ed.gov/nceskids/createagraph/default.aspx?ID=a3d5ae648c25468387d1262509c2932e>
* Students enter information carefully into the graph after filling in headings (x axis/y axis, title, etc)
* What makes a good survey? Students discuss and analyse how we can gather/use quality information to gain information about a subject/group of people. For example; “Who is your favourite Russian soccer team” would be a poor question because it doesn’t relate to the audience.

Investigation:* *How else could we present this information?* Enter information into a pie graph using Microsoft word. *How is the graph different to the graph we created ourselves? Is it easier to read/harder to read? What are the advantages/disadvantages of this graph?*
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| LEARNING SEQUENCEExtension Late S2 or Early S3 | * *We have created a graph using one of three survey questions. First let us focus on the results of the ”favourite colour” graph.* ***(Repeat this process for each survey)***
* (As a class look at the results of the graph and the trends that may be evident in them- for example, lots of girls picked pink)
* *Based on the information that has been found after viewing the graph, what conclusions can we draw?* (Start with basic conclusions, eg; red was most popular)
* *What are some more interesting conclusions we can draw?* (Here we are looking for students to come up with things such as “Pink was popular because lots of girls like pink” or “We can conclude that 4X doesn’t really have a clear favourite colour.”
* Students write down their observations.
* Share as a class group.
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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.