Booragul Public School NSW Syllabus for the Australian Curriculum – Measurement & Geometry

	Sub Strand – Length 1		
Outcome	Teaching and Learning Activities	Notes/ Future Directions/Evaluation	Date

Stage 2
A student:
> uses appropriate terminology to describe, and symbols to represent, mathematical ideas MA2-1WM
> selects and uses appropriate mental or written strategies, or technology, to solve problems MA2-2WM
> checks the accuracy of a statement and explains the reasoning used MA2-3WM
> measures, records, compares and estimates lengths, distances and perimeters in metres, centimetres and millimetres, and measures, compares and records temperatures MA2-9MG

Language
Students should be able to communicate using the following language: length, distance, metre, centimetre, **millimetre**, **ruler**, measure, estimate, hand span.

Ignition Activities

Height of the children.
Children estimate first their height. Measurement strips are on the wall. Children measure from strip to top of their head.
Students record lengths using the abbreviation for millimetres (mm) and centimetres (cm)

Towering metres
Students work in small groups to build a tower that is 1 metre high. Students estimate when their tower has reached 1 metre, then measure to check. Students make adjustments to the height of the tower, if necessary. The group reports back to the class on how close their estimate was to 1 metre. Individual students record how the estimate was made, and the measured result.
(p. 26-27 *Teaching Measurement Stage 2 and Stage 3*)

Explicit Mathematical Teaching

Measure, order and compare objects using familiar metric units of length
• measure lengths and distances using metres and centimetres
• record lengths and distances using metres and centimetres, eg 1 m 25 cm
• compare and order lengths and distances using metres and centimetres
• estimate lengths and distances using metres and centimetres and check by measuring
⬚ explain strategies used to estimate lengths and distances, such as by referring to a
known length, eg 'My hand span is 10 cm and my desk is 8 hand spans long, so my desk is about 80 cm long' (Communicating, Problem Solving)
• recognise the need for a formal unit smaller than the centimetre to measure length
• recognise that there are 10 millimetres in one centimetre, ie 10 millimetres = 1 centimetre

• use the millimetre as a unit to measure lengths to the nearest millimetre, using a ruler ◻ describe how a length or distance was measured (Communicating) • record lengths using the abbreviation for millimetres (mm), eg 5 cm 3 mm or 53 mm • estimate lengths to the nearest millimetre and check by measuring		

Whole Class Teaching Activities

How to use a ruler Begin the lesson with a whole-class discussion of how to use a ruler to draw and measure lines which have a length of a whole number of centimetres. Students check their rulers to see where the zero is marked, and practise drawing and measuring a line by starting at this point. Students work in pairs, student A and student B. Student A draws five lines for student B, each line to be an exact number of centimetres and a length of less than 30 cm. Student B estimates the length of each line, records the estimate, then measures and labels each line. The roles are then reversed. The activity should incorporate both the use of mm and cm and recorded using the abbreviations. **Teaching Measurement - Stage 2 and Stage 3** pg 28		
Any three items Students work in pairs to find three items in the classroom which have a total length of 25 centimetres or 250 millimetres. Students record their findings by drawing the items, labelling with the measurements in centimetres, and showing how the three lengths were added to make a total of 25 centimetres. **Teaching Measurement Stage 2 and Stage 3** pg 30-31(refer to this for more detail)		
How Many Centimetres in a Metre? Students make a metre strip using 1 cm grid paper. In groups, students randomly cut their metre into 3 pieces and place all the group's strips into a bag. Students take turns to select and measure one strip. Students estimate and calculate what length strip they would need to add to their selected length to make exactly 1 metre. They are asked to explain how they know it will be 1 metre. Calculations for each strip are recorded in a table. | Length	Fraction of 1 metre	Fraction remaining
32 cm	$\frac{32}{100}$	$\frac{68}{100}$ | *Variation:* Students take two strips that together are less than 1 metre, measure them and add the lengths together. They estimate and calculate how long a third strip would need to be to make exactly 1 metre. Students also record the measurements using decimal notation **Sample Units of Work** pg 106		
Measuring Using Centimetres, metres and millimetres Students find objects up to 2 m long and record the lengths in a table. Students compare their table with those of other students to identify the longest and shortest objects.		

Object	Estimate	Measurement	Decimal Notation
Teacher's desk	1 m 15 cm	1 m 7 cm	1.07 m

Discuss objects less than/about the same/ greater than 1 metre. How would you measure them?
Investigate the metre ruler and its markings. Have children measure a variety of objects with a metre ruler.
Sample Units of Work pg 106

Millimetres
Students make a table of things that have a dimension of 10 mm, 5 mm and 1 mm eg the width of a toothpick, the thickness of ten sheets of paper.
Sample Units of Work pg 106

Measuring
Students estimate and measure the length or width of a selection of small objects to the nearest millimetre and record in a table using millimetres and a combination of millimetres and centimetres.

	Estimate	Measurement in mm	Measurement in cm and mm
Width of a pencil			
Length of a pencil sharpener			
Length of a paper clip			

Students could also measure larger objects that need to have precise dimensions eg width, height and thickness of the door, the diameter of a CD ROM.
Sample Units of Work pg 107

Estimating lengths
Groups of students estimate given lengths, measure the length, calculate the error and record in a table and graph it. i.e.

Distance	Actual	Error
12 metres		
10 metres		
14 metres		
15 metres		

18 metres		

The students begin by marking a starting point and make another mark at the estimated distance. The line is then measured and the error calculated. Discuss with the students how they estimated the lengths and the results.
How do you estimate the length?
Do the errors become less? How do you know?

Guided Group /Independent Activities

Investigation
I have found this number of 152cm on a piece of paper. What could this be a measurement of? Children investigate/discuss and search for the object or measurement for this number. Discuss cm is used for measurement of length.
Recognise the need for a smaller unit than the metre. When would we need to measure objects in centimetres and millimetres. Brainstorm with children. Children are given straws of different lengths and estimate which objects have similar lengths. Children can order and estimate the lengths.
Introduce the children to the 30 cm ruler. Look at the intervals of centimetres. Place straws next to the ruler and measure, making sure the children start at 0 not at the end of the ruler.

Matching Measurements
The teacher prepares matching pairs of cards eg 1 m 23 cm, 1.23 m and 123 cm; 7 cm 3 mm, 7.3 cm and 73 mm.
Students use the cards to play games like Concentration, Old Maid and Fish.
Variations: The teacher provides sets of cards in pairs, each with the same measurement represented either in whole centimetres, whole metres or in decimal notation. Students are each given a card and must find the other person in the room with the same measurement on their card. Students then order themselves in terms of shortest to longest measurements on their cards. Students could make their own sets of cards.
Teaching Measurement-Stage 2 and Stage 3- pg 29

Rectangular Dimensions
In groups, students use a piece of string about 20 metres long to form a closed shape. Students make different rectangles using this fixed perimeter. Students record dimensions using metres and centimetres. Students share their solutions and look for patterns.

Planned assessment

Design a container
Choose an object and discuss features that could be measured. Students write a design brief for a container or an object that is to be manufactured. Students must ensure that the brief contains all necessary measurements.

Straw javelin

In pairs, students throw a straw for distance. The distance is measured in metres and centimetres. Students complete a table, first estimating then measuring the distance.

Room for elbows
Students design a dinner table which will seat four students along each side, with enough space to eat comfortably. Students draw a diagram of the table with listed reasons for the dimensions.
(p. 33 *Teaching Measurement Stage 2 and Stage 3*)