

## Booragul Public School NSW Syllabus for the Australian Curriculum- Number and Algebra

<b>Addition and Subtraction 2</b>			
Outcome	Teaching and Learning Activities	Notes/ Future Directions/Evaluation	Language / Date
<p><b>A student;</b></p> <ul style="list-style-type: none"> <li>› describes mathematical situations and methods using everyday and some mathematical language, actions, materials, diagrams and symbols <b>MA1-1WM</b></li> <li>› uses objects, diagrams and technology to explore mathematical problems <b>MA1-2WM</b></li> <li>› supports conclusions by explaining or demonstrating how answers were obtained <b>MA1-3WM</b></li> <li>› uses a range of strategies and informal recording methods for addition and subtraction involving one- and two-digit numbers <b>MA1-5NA</b></li> </ul> <p><b>Syllabus reference:</b></p> <p>Hardcopy page 74-75 Digital: 79 - 80</p>		<p>It is appropriate for students in Stage 1 to use concrete materials to model and solve problems, for exploration and for concept building. Concrete materials may also help in explanations of how solutions were obtained.</p> <p>Addition and subtraction should move from counting and combining perceptual objects, to using numbers as replacements for completed counts with mental strategies, to recordings that support mental strategies (such as jump, split, partitioning and compensation).</p> <p>Subtraction typically covers two different situations: 'taking away' from a group, and 'comparison' (ie determining how many more or less when comparing two groups). In performing a subtraction, students could use 'counting on or back' from one number to find the difference. The 'counting on or back' type of subtraction is more difficult for students to grasp than the 'taking away' type. Nevertheless, it is important to encourage students to use 'counting on or back' as a method of solving comparison problems once they are confident with the 'taking away' type.</p> <p>In Stage 1, students develop a range of strategies to aid quick recall of number facts and to solve addition and subtraction problems. They should be encouraged to explain their strategies and to invent ways of recording their actions. It is also important to discuss the merits of various strategies in terms of practicality and efficiency.</p> <p><i>Jump strategy on a number line</i> – an addition or subtraction strategy in which the student places the first number on an empty number line and then counts forward or backwards, first by tens and then by ones, to perform a calculation. (The number of jumps will reduce with increased understanding. See page 75 for examples</p>	<ul style="list-style-type: none"> <li>• plus,</li> <li>• add,</li> <li>• take away,</li> <li>• minus,</li> <li>• the difference between,</li> <li>• equals,</li> <li>• is equal to,</li> <li>• <b>empty</b></li> <li>• <b>number line,</b></li> <li>• strategy</li> <li>.</li> </ul>

**Explicit Mathematical Teaching**

It is appropriate for students at this Stage to use concrete materials to model and solve problems, for exploration and for concept building. Concrete materials may also help in explanations of how solutions were arrived at. Addition and Subtraction should move from counting and combining perceptual objects, to using numbers as replacements for completed counts with mental strategies, to recordings that support mental strategies (such as jump or split, partitioning or compensation).

At this Stage, students develop a range of strategies to aid quick recall of number facts and to solve addition and subtraction problems. Students should be encouraged to explain their strategies and invent ways of recording their actions. It is also important to discuss the merits of various strategies in terms of practicality and efficiency.

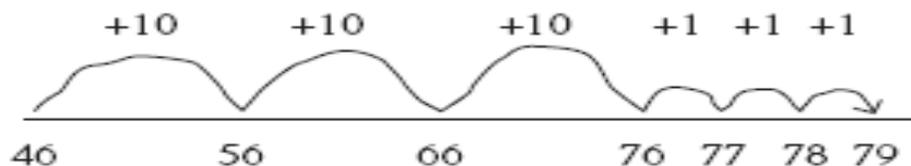
In performing a subtraction, students could use 'counting on or back' from one number to find the difference. The 'counting on or back' type of subtraction is more difficult for students to grasp. Nevertheless, it is important to encourage students to use the 'counting on' strategy as a method of solving comparison problems after they are confident with the 'take away' type.

**Jump strategy on a number line:**

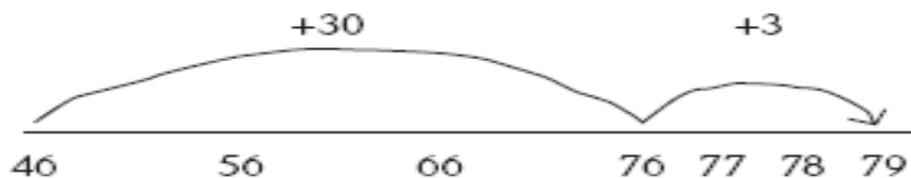
An addition or subtraction strategy in which the student places the first number on an empty number line and then counts forward or backwards firstly by tens and then by ones to perform a calculation. (The number of jumps will reduce with increased understanding.)

eg  $46 + 33$

Method 1:



Method 2:



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**Make 100 - from sample units of work page 43 - 45**  
 The teacher removes the picture cards (Kings, Queens, Jacks) from a standard pack of playing cards. The Ace is used to represent one.  
 In small groups, each student is dealt six cards.  
 The aim of the activity is to add all six card numbers together to make the closest total to 100 (but no greater than 100).  
 Each student can nominate one of their cards to be a 'tens' card.  
 For example, if the student was dealt they could nominate the 7 card to have the value 70 and add the remaining cards for a total of 93.  
 Students could use a calculator to assist. They should be encouraged to record their calculations.

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**Race To and From 100 - from sample units of work page 43 - 45**  
 In pairs, students roll a die and collect that number of pop sticks. These are placed on a place value board in the 'Ones' column.  
 Eg

Hundreds	Tens	Ones

The student continues to roll the die, collect popsticks and place them in the Ones column. The total number of popsticks in the 'Ones' column is checked and bundled into groups of ten, when ten or more popsticks have been counted. The bundles of ten are then placed in the 'Tens' column. When there are ten tens, they are bundled to make one hundred and the game is finished. After the idea of trading is established, students could record the total number of popsticks on the place value board after each roll.  
 Variation: Students start with 100 popsticks in the 'Hundreds' column. As the die is rolled, the number of popsticks is removed from the place value board by decomposing groups of ten. The game is finished when the student reaches zero.

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**Doubles Bingo - from sample units of work page 43 - 45**

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Students are given a blank  $2 \times 3$  grid and six counters.  
 Students are asked to record a number in each square that is 'double any number' on a standard die

Eg

12	2	8
6	2	6

The teacher rolls the die and states the number shown.  
 Students 'double the number' on the die and place a counter on the corresponding answer on their grid.

**Add or Take away - from sample units of work page 43 - 45**

The teacher removes the picture cards (Kings, Queens, Jacks) from a standard pack of playing cards. The Ace is used to represent one.

In small groups, each student is dealt four cards. The top card of the pack is then turned over to become the 'target card'.

Students attempt to make an addition or subtraction number sentence, using any of their four cards, so that the answer equals the number shown on the 'target card'. Students who can do this collect a counter.

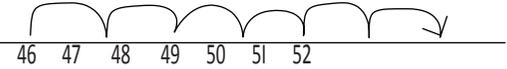
The cards are returned to the pack, shuffled and the activity is repeated. Play continues until one student has collected ten counters.

**Two Bags of Popsticks - from sample units of work page 43 - 45**

Students are given two paper bags, each containing more than ten popsticks. Students count the number of popsticks in each bag and record the amount on the bag. Some students may choose to bundle 10 popsticks together using an elastic band. Students are asked to determine the total number of popsticks in both bags. They record, share and discuss the strategies they used to calculate the total. A variety of strategies is possible.

*Variation:* The activity could be repeated, varying the number

<p>of popsticks to suit student performance on the task. Different materials, such as interlocking cubes, could be used.</p> <p>Possible questions include:</p> <ul style="list-style-type: none"> <li>■ how can you make 37 with popsticks?</li> <li>■ what other strategy could be used to combine the two numbers?</li> </ul> <p>Students compare recording methods with a partner and determine the quickest strategy.</p>		
<p><b>Toss and Add - See sample units of work page 43</b></p> <p>Students toss three standard dice and race to see who can state the total number of dots first.</p> <p>Students are asked to share and explain their strategies.</p> <p>eg</p> <p>For this example, student strategies could include:</p> <ul style="list-style-type: none"> <li>■ counting all of the dots</li> <li>■ starting with the highest number and counting on the other dice one-by-one ie 4, 5, 6, 7</li> <li>■ starting with the known sum of two dice and counting on the third eg '4+1=5 and 2 more.'</li> <li>■ using visual imagery eg 'I took the one dot and pretended it jumped onto the 'four' dice to make 5 dots, and then I added 2 more.'</li> </ul> <p>Possible questions include:</p> <ul style="list-style-type: none"> <li>■ can you find a quicker way to add?</li> <li>■ can you add five more?</li> <li>■ how many do you have altogether?</li> <li>■ how did you get your answer?</li> </ul> <p><i>Variation:</i> Students could repeat the activity using numbered dice or dice with larger numbers.</p>		
<p><b>Make Your Calculator Count - from sample units of work page 43 - 45</b></p> <p>Students are shown how to use the process of repeatedly adding the same number on a calculator to count</p> <p>eg</p> <p>In pairs, students use the calculator to count from one by repeatedly pressing the '=' button and record the counting</p>		

<p>numbers on a paper strip. This process can be repeated by constantly adding other numbers</p>		
<p><b>Counting-on Cards - from sample units of work page 43 - 45</b> <b>Part A</b> The teacher prepares a set of number cards (a selection of numbers ranging from 20 to 50) and a set of dot cards (1 to 10). Each set is shuffled and placed face down in separate piles. In small groups, one student turns over the top card in each pile eg Students add the numbers represented on the cards together, and state the answer. The first student to give the correct answer turns over the next two cards. <i>Variation:</i> Students are asked to subtract the number on the dot card from the number on the number card. <b>Part B</b> Students discuss the strategies used in Part A. The teacher models recording strategies on an empty number line eg</p>  <p>Students are given the cards from Part A and are asked to turn over the top card in each pile and record their strategies using their own empty number line. Students share their strategies.</p>		
<p><b>Money Matters</b> <b>Part A</b> Students are given a collection of coins. They demonstrate different ways to make 10c, 20c and 50c (and then \$1 and \$2) using the coins. Students record their findings. Possible questions include:</p> <ul style="list-style-type: none"> <li>■ how many different ways can you represent 50c?</li> <li>■ what counting strategy did you use to determine the amount of money you had?</li> </ul>		



**Part B**

The teacher creates shopping situations where one student is given an amount of money to spend. They purchase a list of items. The shopkeeper totals the items and calculates the change. Students discuss strategies used to determine the cost of the list of items and the change to be given.


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