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

Patterns and Algebra 1			
Outcome	**Teaching and Learning Activities**	**Notes/ Future Directions/Evaluation**	**Language / Date**
A student: › describes mathematical situations and methods using everyday and some mathematical language, actions, materials, diagrams and symbols **MA1-1WM** › uses objects, diagrams and technology to explore mathematical problems **MA1-2WM** › creates, represents and continues a variety of patterns with numbers and objects **MA1-8NA** **Australian Curriculum Syllabus reference:** **86-87**			pattern, **number line**, **number chart**, **odd**, **even**.
Activities			
Counting Patterns - Students are divided into two groups. A hundreds chart is displayed. Class counts by 5s to 100 referring to hundreds chart. As they count groups take turns to name the next number in the sequence Eg. Group 1- 5, Group 2- 10, etc. What do you notice about the numbers we are saying?			
Is It True? Record statements such as the following, some true and some not true, and ask students if they are true, and to justify their answers. For example: 14 + 2 = 2 + 14 18 + 3 = 2 + 18 56 + 79 = 79 + 56 Do students realise that they do not have to do the addition in any of these examples, but they simply have to compare the two expressions? Do they baulk at the large numbers in the third example, not realising that no			

calculations need to be done?
This activity gives students the opportunity to generalise about patterns of addition. The term commutative property is not used at this stage.
Students make comments such as You don't have to do the plus, you just have to see it's the same numbers backwards.

Number Relationships

At this Stage, describing number relationships and making generalisations should be encouraged when appropriate. The concept of equality and the understanding that the equals sign also means 'is the same as' is important.

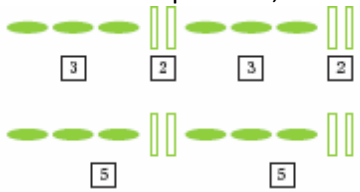
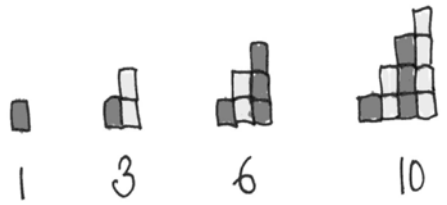
Things to consider

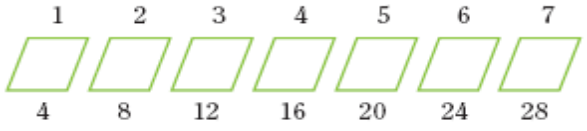
- Use the equals sign to record equivalent number relationships and to mean 'is the same as' rather than as an indication to perform an operation
  Eg 5 + 2 = 4 + 3
- Build addition facts to at least 20 by recognising patterns or applying the commutative property
  Eg 4 + 5 = 5 + 4
- Relate addition and subtraction facts for numbers to at least 20
  Eg 5 + 3 = 8 so 8 - 3 = 5 and 8 - 5 = 3
- Model and record patterns for individual numbers by making all possible whole number combinations
  E.g 0 + 4 = 4
  1 + 3 = 4
  2 + 2 = 4
  3 + 1 = 4
  4 + 0 = 4
- Find and make generalisations about number relationships eg adding zero does not change the number as in 6 + 0 = 6 (additive identity)
  Odd + odd = even
  Odd + even = odd
  Students explain why.

Labelling Patterns

Make a linear repeating pattern with objects or shapes such as the following.

Students describe the pattern and give it a name. If they label it as a *square-circle pattern*, ask: *Can you give it a number name?* If they suggest *six pattern*, extend the

pattern so it can no longer be called a *six pattern* as below.  Ask students if they can think of a number name that doesn't have to change when the pattern is extended. Ask them to explain why they choose the labels they do. A possible label for this pattern is a *two pattern* because the part of the pattern that repeats has two shapes. Consider the following pattern:  If a student calls it a *one-two pattern*, ask if there could be any other name for it. Calling it a *three pattern* leads to concepts of number combinations. Provide numeral cards with collections of objects or shapes. Students use them as labels for their patterns, as in the following examples.  Also provide blank cards for students to create their own labels		
Frog Jumps - Set of number cards are placed face down in order. Teacher turns over cards eg. 3, 6 and 9 and places the frog counter on number 9. Teacher explains that Freddie the Frog has jumped on some of the cards to make a number pattern. Ask questions. (Refer to p. 61 of Sample Units for these)		
Number sequences Students investigate sequences of numbers that have arisen in their number investigations, using interlocking cubes or counters, and recording their findings. For example, they find the sequence of staircase numbers, making them with interlocking cubes, drawing them and recording the number of cubes used.  		
Continuing Number Sequences		

Begin a number sequence and ask students to work in pairs to continue it. The following are sequences that the students have previously generated (count-by-threes, staircase numbers, doubling sequence, square numbers). 3, 6, 9, 12, 15, … 30, 27, 24, 21, 18, … 1, 3, 6, 10, 15, … 1, 4, 7, 10, 13, … 1, 2, 4, 8, 16, … 1, 3, 7, 13, 21, … 1, 4, 9, 16, 25, … 100, 90, 81, 73, 66, … Students describe the patterns and how they continued them. This will involve them in describing and labelling the patterns. This activity provides an opportunity to develop mathematical language. Support students to use appropriate language. Students set similar tasks for their peers.		
Generating Sequences by Making Patterns Another way to generate sequences is to create repeating patterns. For example, to generate the sequence of multiples of four, students make a series of rhombuses from pop sticks or matchsticks and keep a record of how many sticks they have used altogether after each rhombus is added. They also record the number of rhombuses. After constructing some rhombuses, ask students to discuss how they could continue the sequence without making the shapes. As they work, ask students to explain how they are generating the number sequence, and ask them to give the sequence a title. The data is later recorded in a table. [See PAS3.1a]  	s	