**MATHEMATICS Stage 2**

**TEACHING AND LEARNING OVERVIEW**

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| TERM: | WEEK: 9 | STRAND: Number and Algebra | **SUB-STRAND:** Patterns and Algebra 2 | **WORKING MATHEMATICALLY:**  MA2-1WM MA2-2WM MA2-3WM |
| OUTCOMES: MA2-8NA | | **Generalises properties of odd and even numbers, generates number patterns, and completes simple number sentences by calculating missing numbers.** | | |
| **CONTENT:** | | **Explore and describe number patterns resulting from performing multiplication (ACMNA081)**   * Use the word ‘term’ when referring to numbers in a number pattern * Describe the position of each term in a given number pattern, e.g. “The first term is 6” (communicating) * Find a higher term in a number pattern resulting from performing multiplication, given the first few terms, e.g. determine the next term in the pattern 4, 8, 16, 32, 64,…… * Describe how the next term in a number pattern is calculated, e.g. ”Each term in the pattern is double the previous term” (communicating) | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | * Students skip count by 2s, 3s, 4s and 5s. * Discuss patterns. * Can students see the link between skip counting and multiplication? | | |
| WARM UP / DRILL | | * Using a hundreds chart choose a number and ask chn. to continue counting by that number e.g. 9 - Choose a student to continue the pattern for 5 terms after 100. * Repeat using 4 and 7 as starting numbers. | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | The tap leaks at a rate of 3 litres per hour. How much water has been wasted every hour for up to 8 hours?  * Potatoes are put into 4kg bags. How many kilograms of potatoes are in 9 bags? | | |
| QUALITY TEACHING ELEMENTS | | **INTELLECTUAL QUALITY** | **QUALITY LEARNING ENVIRONMENT** | **SIGNIFICANCE** |
| * Deep knowledge * Deep understanding * Problematic knowledge * Higher-order thinking * Metalanguage   Substantive communication | * Explicit quality criteria * Engagement * High expectations * Social support * Students’ self-regulation * Student direction | * Background knowledge * Cultural knowledge * Knowledge integration * Inclusivity * Connectedness * Narrative |
| RESOURCES | | Hundreds chart  Individual number sequence cards  Studyladder https://www.studyladder.com.au/login/account | | |

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES | |
| Explicitly communicate lesson outcomes and work quality.  * Review processes as well as signs =, x. * Define and reinforce metalanguage used in this unit e.g. number pattern, term, equivalent, continue, position. * Explain to students that when trying to work out a number pattern it is useful to ask whether the pattern is travelling forward or backwards. If it is travelling forward, it must be using either addition or multiplication. If backwards, then it must be using division or subtraction. Provide examples and ask students to find out what direction the pattern is travelling.   + 4, 8, 16, 32   + 43, 40, 37, 34   + 80, 40, 20, 10 * Complete missing numbers exercises using multiplication;   3 x \_\_ = 15 5 x \_\_ = 35 7 x \_\_ = 28   * Discuss answers if numbers are reversed   5 x \_\_ = 15 7 x \_\_ = 35 4 x \_\_ = 28   * What do you know about the order in which numbers are multiplied?   3 x 2 x 6 = 36 and 6 x 3 x 2 = 36 | LEARNING SEQUENCERemediation S1 or Early S2 | Whole class or individual completion of Studyladder activities – Patterns and Algebra Year 2   * Identify missing elements in number patterns. E.g. 15, 18, \_\_, 24, 27, 30. What is the missing 3rd term? Identify rule * Investigating number patterns formed by skip counting. E.g. 0 10 20 30 40 50 60   0 2 4 6 8 10 12 14  Which number pattern is increasing by 2? |
| LEARNING SEQUENCES2 | The following activities can be written using Studyladder Pattern Creater in Patterns and Algebra Resources where you can create the pattern of your choice, drag cards over numbers you want to cover and show or hide the associated rule.   * Write a series of number sequences on board e.g. 2, 4, 8, 16, 32 … Ask students what the next 2 terms will be and how they worked it out (x2) * Write a series of numbers on board and ask students to identify the number that does not belong. E.g. in 15 24 8 12 6 30, it is 8 that does not belong because the rest are multiples of 3. * In groups children are provided with a card with a number from a set sequence on it. E.g. 9, 18, 27, 36… Chn. order themselves in the correct sequence and identify what term they are (1st, 2nd,  3rd…) of that sequence. * Provide beginnings of number patterns ask chn. to continue them to the tenth term and explain how they worked them out. (Calculators could be used.) Eg. 3, 6, 12, 24, 48, 96, 192, 384, 768, tenth term = 1536. (Doubling) * Write a number sequence on the board: 7, 14, 21, 28,\_\_,\_\_.\_\_,\_\_. Ask chn. to describe the pattern and continue it together. What will the 10th term be? How did they work it out? What will the 20th term be? How did they work it out?   Assessment   * Using matchsticks students make a row of 5 pentagons then complete a table showing how many matchsticks will be needed to make 15 pentagons.   Pentagon 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Matches 5 10 \_\_ \_\_ 25 \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_\_ \_\_\_ \_\_\_ \_\_\_ |
| LEARNING SEQUENCEExtensionLate S2 or Early S3 | * Word problems.   1. A factory makes 4 cushions out of every metre of fabric. Draw a table that shows the number of cushions that can be made from up to 10 metres of fabric.  2. If workers are paid $22 per hour. Draw a table to show how much they would receive for up to 10 hours work.  At the end of each table predict what the 15th term would be.   * Including fractions and decimals in the patterns |
| **EVALUATION & REFLECTION** | Student engagement; Achievement of Outcomes;  Resources; Follow up; |