**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM: | WEEK: | STRAND:NUMBER AND ALGEBRA | **SUB-STRAND:**  WHOLE NUMBERS 1 | **WORKING MATHEMATICALLY:**  MA3-1WM & MA3-2WM |
| OUTCOMES: MA3-4NA | | **Orders, reads and represents integers of any size and describes properties of whole numbers.** | | |
| **CONTENT:** | | **Recognise, represent and order numbers to at least tens of millions**   * record numbers of any size using expanded notation, eg 163 480 = 100 000 + 60 000 + 3000 + 400 + 80 * [partition](http://syllabus.bos.nsw.edu.au/glossary/mat/partitioning/?ajax) numbers of any size in non-standard forms to aid mental calculation, e.g. when adding 163 480 and 150 000, 163 480 could be partitioned as 150 000 + 13 480, so that 150 000 could then be doubled and added to 13 480 CCT | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | **On the board write the following problems:** (On a blank number line students show how they got their answers).  1. Put in order from smallest to largest, 5, 3, 0, 35, 21, and 12.  2. Solve 3+4-8-3=.  3. Count forward/backwards on a number line from a given starting number. Counting can be in multiplies of 2, 5, 10 etc. | | |
| WARM UP / DRILL | | **The answer is ...what is the question?** Write a number on the board such as 250. Allow time for students to generate questions to match the answer. Share the answers and challenge students to vary their responses, e.g. 200 +50, 100+100+50, 1000-750, 5x50 etc.  **Mental calculation**. Begin with a number. Ask students to calculate a series of tasks in their head e.g. begin with 5, add 7, subtract 10, add 3, subtract 9, what is the number? | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | There were 25 students in a class. In a class competition, the average number of points scored per student was 150. What was the total number of points scored by all the students in the class? | | |
| 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 | | “Rockin' the Standards Place Value Rap” can be found at: <https://www.youtube.com/watch?v=AuE46_-7L5c>  “We Will Round You” can be found at <https://www.youtube.com/watch?v=41QZvFIC8mk>  Counting on Teaching Activities: <https://portalsrvs.det.nsw.edu.au/f5-w-68747470733a2f2f6465747777772e6465742e6e73772e6564752e6175$$/curr_support/maths/counting_on/Learning_Resources/pdf/co_pv.pdf>  Selection of expanded notation dice, sets of numeral cards 0-9 | | |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES | |
| * **Watch YouTube Clip of the “Rockin' the Standards Place Value Rap”** * The convention for writing numbers of more than four digits requires that they have a space (and not a comma) to the left of each group of three digits, when counting from the Units column. * Students need to develop an understanding of place value relationships such as: 10 thousand = 100 hundreds = 1000 tens = 10 000 ones. * Explain to the students how each place-value house is broken into hundreds, tens, and ones. * Help the students to read the numbers in their house positions. In particular, assist the students to read numbers like 34 009 083 080, where the zero’s must be noticed but are not read out loud. * Notice the first house needs no name. (It is called “The Trend Setter House” because it starts the pattern of column names within every house.)      * Give the students a number and get them to add the place-value houses then read aloud the number. Once the students’ knowledge is secure ask them to read numbers like 34 908 345 002 without houses. | LEARNING SEQUENCERemediationLate S2 | * **Place Value Houses Remedial Activity:** Focus on numbers that are in the hundreds, thousands first and then add the millions. Re-watch the Place Value Story on YouTube. * **Make Some Numbers Remedial Activity:** Students make 3 digit numbers as per class activity but without using the “0” numeral card. |
| LEARNING SEQUENCES3 | * **Using place value dice (10s, 100s, 1000s, etc.).** Ask a student to roll a die and show the rest of the class. Ask the students “What is the number before this?” (the number one less than that shown on the die). Immediately following this, ask the students “What is the number after this?” (the number one more than that shown on the die). Continue with various other place value dice. * In pairs students roll a selection of place value dice (1s to 100 000s). They record their result in the correct order in expanded notation form and convert this to a number (e.g. 50 000+2 000+300+60+5 = 52 365) * **Make Some Numbers (Counting on pg 103).** In pairs, students deal themselves three single-digit cards. Students write down the six possible numbers that can be generated using those three digits. If a zero is   selected, then include the numbers with zero in the hundreds place. Students then each order their six  numbers from smallest to largest and record how many groups of ten could be formed with the smallest  number. Pairs of students swap their solutions for checking.   * **Climb The Ladder (Counting On pg 104).** Get three 0-9 dice. Players take turns to throw the three dice. The player decides which digit is the hundreds, which one is the tens and which is the ones. Each student draws a five square ladder. Students write the number they have made onto one “rung” of their ladder. The ladder must progress from smallest to largest numbers, from bottom to top. If you cannot put your number on the ladder in order, you must lose that turn. First one to complete their ladder wins. * **Assessment:** Individually, students roll a 0-9 die as many times as they can to make the largest number they can read to the teacher. They write the number in expanded notation and write two numbers higher and two numbers lower than their number. |
| LEARNING SEQUENCEExtensionLate S3 | * **Place Value Houses Extension Activity:** Go on to reading numbers in the quadrillions and quintillions houses, and/or include thedecimal place values tenths, hundredths, thousandths, ... * **Make Some Numbers Extension Activity:** Students make 4 and 5 digit numbers and record how many groups of 100 or 1000 they can make. |
| **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.