**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM: | WEEK: 9-12 | STRAND:Number and Algebra | **SUB-STRAND:**  Whole Number 1 | **WORKING MATHEMATICALLY:**  MA3-1WM, MA3-2WM, MA3-4NA |
| OUTCOMES: | | **A student:**  › describes and represents mathematical situations in a variety of ways using mathematical terminology and some  conventions MA3-1WM  › selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations MA3-2WM  › orders, reads and represents integers of any size and describes properties of whole numbers MA3-4NA | | |
| **CONTENT:** | | determine all 'factors' of a given whole number, eg 36 has factors 1, 2, 3, 4, 6, 9, 12, 18 and 36  determine the 'highest common factor' (HCF) of two whole numbers, eg the HCF of 16 and 24 is 8 determine 'multiples' of a given whole number, eg multiples of 7 are 7, 14, 21, 28, …  determine the 'lowest common multiple' (LCM) of two whole numbers, eg the LCM of 21 and 63 is 63  determine whether a particular number is a factor of a given number using digital technologies  recognise that when a given number is divided by one of its factors, the result must be a whole number (Problem Solving)  solve problems using knowledge of factors and multiples, eg 'There are 48 people at a party. In how many ways can you set up the tables and chairs, so that each table seats the same number of people and there are no empty chairs?' | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | |  | | |
| WARM UP / DRILL | | **Bingo**  Teacher or child reads out statements on small cards eg two hundred less than 45 600 and children check their bingo boards to see if they have that number eg 45 400  State the place value of digits in numbers of any size  **Boing**  Students go around in a circle and say ‘boing’ on multiples of a chosen number i.e. 6 – 1, 2, 3, 4, 5, boing, 7, 8, 9, 10, 11, boing, 13… | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | |  | | |
| 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 | | Whiteboard and markers, paper and pencils, 100s charts, SMART board, set of dominos, number cards(1-36) | | |

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | TEACHING AND LEARNING EXPERIENCES Weeks 7-9GUIDED & INDEPENDENT ACTIVITIES | |
|  | LEARNING SEQUENCERemediation | **Background Information**  Students need to develop an understanding of place value relationships, such as 10 thousand = 100 hundreds = 1000 tens = 10 000 ones.  **Support**: peer tutor grouping strategies  **Nudge**  ‘We are learning how a number containing nines “rolls” over to leave zeros when 1, 10, 100 ... is added to the number, and how zeros “roll” back to nines with subtraction by 1, 10 ,100 ...  Activity  The students use the numeral cards to recreate counting sequences in a way that’s similar to the action of a car odometer. They can wear hats marked with the place values involved, for example, ones, tens, hundreds, thousands ...  Have a student as the ones counter, counting in ones. Stop them at nine. Ask, “What will happen when one is added?” Discuss how adding one rolls nine over to 10 and that another counting place (tens) is needed.  Count in ones from 95 until 99 rolls over to 100. Start with 93 and add 10 to it. Discuss how the nine rolls over. Repeat by adding 10 to 94, 99, 90 ...  Add 1, 10, then 100 to 99. Add 1, 10, 100 to 899. Add 1, 10, 100 to 998.  Activity  Roll 1 000 back 1, 10, 100. Roll 3 000 back 1, 10, 100. Roll 309 back 1, 10, 100.  **Partition Method**  Partition numbers of any size in non-standard forms  eg. 163480 + 150000 = (150000 + 13480) + 150000  Students require multiple opportunities to partition numbers before you introduce partitioning to solve multiplication problems |
| LEARNING SEQUENCE | **Count –Off Activities**  Roll three ten-sided (decahedron) die. Have the students start counting from the number rolled, adding ten, hundred, thousand to the count each time. Then count backwards by tens, hundreds, thousands. Have one student select a number and call out the number. Once the student calls out the selected number, the rest of the class continue counting by adding ten or hundred, thousand each time. Students use intonation to express numbers of a certain number e.g. 1, 2, **3**, 4, 5, **6**, 7…  Pupils count forward or back within an appropriate number range. Ask them to stop straight away when they counted a certain number of steps. For instance they count back 5000 from 8750 in steps of 1000. What number did they end up with?  Give pupils the starting and finishing numbers and size of steps. They count within these numbers then hold up fingers to show how many steps have been counted eg Count on from 256 to 286 in tens? How many tens?  Count back from 2654 to 2054. How many hundreds?  **Factor Bingo**  Children choose 10 numbers (factors). Roll two die and the factors of those numbers can be ticked off (i.e. roll a 1 and 2 = 3, any number with 3 as a factor they can tick off.  **Factor trees**  Determine highest and lowest multiples of two numbers. Students complete factor trees to compare. |
| LEARNING SEQUENCEExtension |  |
| **EVALUATION & REFLECTION** |  |

* 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.

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | TEACHING AND LEARNING EXPERIENCES Weeks 9-12GUIDED & INDEPENDENT ACTIVITIES | |
|  | LEARNING SEQUENCERemediation | **Totals**  Use the digits 1, 2, 3, 4, 5, 6, 7, 8, 9, and addition to make the largest possible total and the smallest possible total.  Use addition signs and subtraction signs to total 100   |  |  |  |  | | --- | --- | --- | --- | | **Numbers Between** | **Sum** | **Difference** | **The Numbers are** | | **50 and 100** | **135** | **5** | **65, 70** | | **10 and 100** | **90** | **60** |  | | **100 and 200** | **205** | **55** |  | | **100 and 200** | **262** | **42** |  | | **500 and 1000** | **1 585** | **85** |  |   **Complete the table**  **Guess and Check**  Give each student two identical subtraction squares. On the first square students record their estimates of the answers, in the second square students record the answers they obtained using a calculator.  Estimate   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | **2869** | **6431** | **7963** | **8064** | | **1863** |  |  |  |  | | **2000** |  |  |  |  | | **2679** |  |  |  |  | | **196** |  |  |  |  |   **How many tens/hundreds/thousands/millions/tens of millions?**  Write a start number on the board or say it aloud to the students eg 35 670.How many tens/hundreds thousands will we have to count to get past 40 000? Repeat for other numbers?  State the place value of digits in numbers of any size.  **Hopper Support**: peer tutor grouping strategies, decrease number of dice used.  **Wishball Support**: provide prepared box sheets  **Identity Factors Support**: provide students with number expanders  **Prime Factorisation Support**: peer tutor grouping strategies, calculators to assist budgeting  **Mystery Numbers Support**: concrete material to add totals  **The Factor Game Support**: provide concrete materials to complete task, encourage students to use a variety of problem solving strategies |
| LEARNING SEQUENCE | **Hopper Challenge**: *Whole Numbers TaLe Reference Number:L1087*  Students select a jump size between 1 and 10 and the starting point is generated randomly on a grid of whole numbers between 0 and 999    **Identity Factors**  <http://au.ixl.com/math/year-6/identify-factors>  **Prime Factorisation**  <http://au.ixl.com/math/year-6/prime-factorisation>    **The Factor Game**  <http://illuminations.nctm.org/ActivityDetail.aspx?ID=12>  **Multiple Relay**  Cards printed with selected multiples are spread on the floor. Students are placed into teams.  At a given signal, the teams take the cards, distribute one to each member and order themselves as a sequence of multiples.  First team to finish is the winner.  **Dominos**  Spread the number cards out. Take it in turns to turn over a domino and multiply the two sets of dots. Put the domino on the appropriate number card. Continue until all dominos are used.  Discussion: Why do some cards have more dominos than others?  Problem Solving  Students solve open ended and ‘what if’ questions based on relationships between multiples, factors, and whole numbers i.e. “ How many different combinations are there to set up tables and chairs at a party whereby 64 people have to be seated so that each table seats the same number of people and there are no empty chairs. |
| LEARNING SEQUENCEExtension | **Hopper Extension**: use multi-sided dice and/or increase number of dice  **Mystery Numbers Extension**: increase number values and/or size of grid used  Multiple Relay Extension: Have teams of 5, give three cards per team (EG 4,8, 12) the last two students continue the pattern orally (by saying 16,20) |
| **EVALUATION & REFLECTION** |  |

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