**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| TERM: | WEEK: 11 | STRAND:Number and Algebra | **SUB-STRAND:**  Multiplication and Division 2 | **WORKING MATHEMATICALLY:**  MA2-1WM, MA2-2WM, MA2-3WM |
| OUTCOMES: MA2-6NA | | **Uses mental and informal written strategies for multiplication and division.** | | |
| **CONTENT:** | | Develop efficient mental and written strategies, and use appropriate digital technologies, for multiplication and for division where there is no [remainder](http://syllabus.bos.nsw.edu.au/glossary/mat/remainder/?ajax" \t "_blank" \o "Click for more information about 'remainder')   * model and apply the associative property of multiplication to aid mental computation * multiply three or more single digit numbers | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | * Worksheet - Complete a worksheet where equations need to be sorted as to whether they are commutative or associative. | | |
| WARM UP / DRILL | | * **Multiplication Memory**   Select a multiple to be practised. Prepare 40 cards, 10 multiplication question cards and 10 division question cards for the selected multiple and 20 appropriate answer cards. Have the students shuffle the cards and place them face down on the floor in four or five rows. The students then take turns to flip over two cards. If a student turns over a question card and the correct answer card then he or she keeps the cards. All players must agree that the cards are a “match”. If the cards do not match then the student flips the cards back over. The player with the most cards wins.  **Variation** Have the students create their own set of cards for other multiples. | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | I can type 9 words per minute. How many words will I type in 8 minutes? | | |
| 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 | | Cards with ten x and ÷ questions for selected multiple and answers cards (Multiplication Memory), 3 x 3 square boards/stencils, numeral cards 1-9, dice, Associative property of multiplication game stencils, | | |

**TEACHING AND LEARNING EXPERIENCES**

|  |  |  |  |
| --- | --- | --- | --- |
| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES | | |
| Explicitly teach Model and apply the associative property of multiplication to aid mental computation  Multiply three or more single digit numbers   * **WC – Revise the commutative property of multiplication 7 x 9 = 9 x 7**   Watch:  <https://www.youtube.com/watch?v=rXXrzaDaETI>   * **WC - Associative Property of Multiplication Game**   Students form groups of 3. They roll a die and place the number in the space provided on their stencil (see Appendix). Once 3 numbers have been chosen, students decide where to put brackets to group 2 of the numbers. Players then multiply and compare their numbers with each other. Discuss what is noticed. Using the same numbers, place them on the second set of lines, this time grouping them differently. Discuss why the final product remains the same.    **Metalanguage:**  groups of, rows of, lots of, totals, equals, makes, is the same as, factor, multiple, width, product, times, multiply, multiplied by, multiplication, multiplication facts, tens, ones, double, associative, commutative | LEARNING SEQUENCERemediationS1 or Early S2 | * Students complete multiplication webs with tables grids to support completion. | |
| LEARNING SEQUENCES2 | **Whole class instruction and modelled activities**   * **GW - Doubles**   Students work in small groups. A student chooses a small whole number and the next student doubles it. They take turns to keep doubling the number. A student checks the results with a calculator. In the next round they start with a different number.  Possible questions include:  ❚ what did you notice?  ❚ did the pattern help you with your calculations?   * **GW or I - Times Squares**   The teacher chooses 9 cards between 1 and 9 and places them in a 3 x 3 square  The student multiplies each row and column and records the answers. Students show the use of the associative property of multiplication when finding their answers. Students rearrange the cards and record the new multiplication squares.  **GW** In pairs, students play an online game based on the associative property of multiplication  <http://www.math-play.com/math-basketball-properties-of-multiplication/math-basketball-properties-of-multiplication.html>   * **WC - Multiplication Race**   Nominate students to be the compare, caller and checker.  In teams, students are given an equation where they have to multiply three single-digit numbers, eg 5 x 3 x 6. On go, they are shown the equation and then write it onto mini whiteboard (or paper) and stand as soon as they have solved it. The checker uses a calculator to check the answer. Teams rewarded points for 1st, 2nd, 3rd.  **Investigation**   * **GW - Mental Strategies**   Students are asked to write a multiplication fact that they have trouble remembering eg 8 × 7. They are encouraged to try mental strategies to help them recall that fact by using known facts eg ‘I know 7 × 7 is 49 so 8 × 7 must be 7 more than 49 which is 56’ or using the inverse relationship of division:  ‘I know 56 ÷ 8 = 7 so 8 × 7 = 56’.   * **GW - Mental Strategies**   Students are asked to write a division fact they have trouble remembering eg 36 ÷ 4. They are encouraged to try mental strategies to help them recall the fact eg using known division facts ‘I know 40 ÷ 4 = 10 so 36 ÷ 4 = 9’; using other known facts ‘half of 36 is 18, then if I halve it again I get 9’; using the inverse relationship of multiplication: ‘4 × 9 = 36 so 36 ÷ 4 = 9’.   * Assessment: Students complete worksheets to assess knowledge of multiplication and division without remainders. | |
| LEARNING SEQUENCEExtensionLate S2 or Early S3 | **Extension**   * **Multo**    Provide each student with a 4X4 grid   Students write products from 1X1 up to 10X10 in each square |  Roll ten sided dice twice, multiply numbers together   Students cross off the answer on grids   First with four in a row win – any direction |
| **EVALUATION & REFLECTION** | Were the students engaged in learning?  Were resources appropriate/easily available? | Did group work allow for differentiation?  Were students able to reflect on their learning? |