**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM: 1 | WEEK: 3 | STRAND: Whole Number | **SUB-STRAND:** Addition and Subtraction | **WORKING MATHEMATICALLY:** MA3-1WM, MA3-2WM, MA3-3WM |
| OUTCOMES: MA3-5NA | **Selects and applies appropriate strategies for addition and subtraction with counting numbers of any size.**  |
| **CONTENT:**  | **Use estimation and rounding to check the reasonableness of answers to calculations (ACMNA099)**\* Use estimation to check the reasonableness of answers to addition and subtraction calculations, eg 1438 + 129 is about 1440+130 |
| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | **Verbal discussion** -Begin with a class discussion on what has been studied on estimation in the previous week. Why do we use estimation? What are some strategies that help us to estimate?**Whole class observation-** Students will record 5 examples of everyday contexts in which we use estimation- example: shopping, building, running a restaurant, catering, sport events etc.  |
| WARM UP / DRILL | **Images- The students will begin** with viewing a range of images on the interactive whiteboard. These images will be shown for 5 seconds each and students must estimate the quantity/ number of each picture. (see attached for examples) **Algorithms- The students will then** be shown a series of number algorithms and use the same estimation strategies studied last week. See <http://www.modernchalkboard.com/addition.html> for addition and subtraction algorithms for interactive whiteboard. **Interactive estimation game**- Using i-pads and or computers in partners students will play an estimation game as a quick warm up game. <http://www.oswego.org/ocsd-web/games/Estimate/estimate.html>  |
| QUALITY TEACHING ELEMENTS | **INTELLECTUAL QUALITY** | **QUALITY LEARNING ENVIRONMENT** | **SIGNIFICANCE** |
| * Deep knowledge
* Deep understanding
* Problematic knowledge
* Higher-order thinking
* Metalanguage
* Substantivecommunication
 | * Explicit quality criteria
* Engagement
* High expectations
* Social support
* Students’ self-regulation
* Student direction
 | * Background knowledge
* Cultural knowledge
* Knowledge integration
* Inclusivity
* Connectedness
* Narrative
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| RESOURCES | Maths books, pens/pencils, images attached, class i-pads, laptops <http://www.modernchalkboard.com/addition.html>, <https://secure.vport.voyagerlearning.com/vip/.../TM_L1_U2_L07_SE.pd> <http://www.mathsisfun.com/flash.php?path=%2Fnumbers/images/estimate.swf&w=930&h=600&col=%23000000&title=Estimation+Games> <http://www.oswego.org/ocsd-web/games/Estimate/estimate.html>  |

**TEACHING AND LEARNING EXPERIENCES**

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| --- | --- |
| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| * **Explicitly communicate lesson outcomes and work quality.**
* **Teacher introduces** the idea of using estimation not only to answer algorithms and worded problems but to check these answers and worded problems.
* **The teacher will explain** the idea of using estimation to check the reasonableness of answers using a resource on the smart board. Here there are explanations and demonstrations of how to use estimation when check addition and subtraction answers. <https://secure.vport.voyagerlearning.com/vip/.../TM_L1_U2_L07_SE.pd>
* **The teacher will begin by** **modelling** three subtraction algorithms on the board. Here the teacher will answer 2 correctly and one incorrectly. Students must decide which answer is incorrect using estimation. For example Mary had $2343 and spent $2243 her change was $154. Correct/incorrect why? Repeat the same process with addition.
* **Teacher will** **show a video** <http://www.youtube.com/watch?v=G97EnNLtv2Y> and then **scaffold** the same process to the students on the board.
 | LEARNING SEQUENCERemediationS2 | * Students will use calculators and visuals to support their learning
* The teacher will demonstrate one on one with these students how to check answers with rounding
* Students will use smaller numbers and whole numbers
* Refer back to inverse operations and relationships
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| LEARNING SEQUENCES3 | * **Worksheet- In small group’s** students are given a worksheet of addition and subtraction questions that have been answered. Without calculating the answers, the students in the group must discuss if they believe the answer is correct or incorrect and share their reasons why. After deciding on correct or incorrect, the students may together calculate the correct answer.
* **Using i-pads or computers** students will work in partners through an interactive estimation game. <http://www.mathsisfun.com/flash.php?path=%2Fnumbers/images/estimate.swf&w=930&h=600&col=%23000000&title=Estimation+Games> Once one partner has had a turn, the other student will assess the first students answers and decide if their answers were reasonable- why/why not? What strategies did you use and why? Swap after each series of questions.
* **Shopping list-** Students will be asked to come up with a shopping receipt of 10 products and their prices (decided by student) Try to use larger products with 3-4 digits *(decimals may be used here depending on knowledge of class*). They will then give their shopping receipt to a partner to estimate the answer (time limit 1 min.) After the minute they must record their estimated total and return to the original partner who will decide on the reasonableness of their answer using estimation. The first student will then decide how much they paid with. Their partner must now estimate the change and return back to student 1 to again check whether the answer is reasonable.
* **Assessment**- Students will individually be given an addition question and a subtraction question to solve. They must complete one question correctly and one question incorrectly. Students will then swap with a partner. The partner must use estimation to check which question they believe is correct and which is incorrect- explain their answer
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| LEARNING SEQUENCEExtension Early S4 | *

 \*Using larger numbers in addition and subtraction estimation.  \* Apply knowledge to decimals and fractions \*Partake in open ended tasks with larger number such as millions and create a project such as building a house  |
| **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.