**A Q.I. Guide to Maths for Year 3**

**Four Operation Methods**

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| Pupils should be taught to:   * add and subtract numbers mentally, including: a three digit number and ones, a three digit number and tens, a three digit number and hundreds. * add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction * estimate the answer to a calculation and use inverse operations to check answers * solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. | | |
| |  |  | | --- | --- | | ? | | | 75 | 57 |   Addition strategies  **Use bar model to secure understanding of addition:**  C**rossing** through the hundreds barrier and **bridging** the tens barrier on a **number line** e.g. 75 + 57 = 132  +2      +30 +20 +5  75 105 125 130 132   |  |  | | --- | --- | | 100 | | | 37 | ? |   **Counting up** to solve **missing number problems** on a number line e.g. 37+ = 100  +3  +60  =  100  40  37   |  |  | | --- | --- | | 230 | | | 180 | ? |   e.g. 180 + = 230 (counting on)  e.g. **How much more** is 230 than 180?  What is the **difference** between 180 and 230?        +20 +30 = 50    180 200 230  **Add** a **near multiple** of 10 (a nearly number) using **rounding and adjusting.**    45 + 19  +20    -1  45 64 65  **Expanded horizontal column addition**  55 + 23  50 5  + 20 3  70 + 8 = 78  75 + 67  70 5  + 60 7  130 + 12 = 142  375 + 67  300 70 5  + 60 7  300 + 130 + 12 = 442  **Expanded horizontal column addition**  375 + 267  300 70 5  + 200 60 7  500 + 130 + 12 = 642 | | Subtraction strategies  **Use bar model to secure understanding of subtraction:**   |  |  | | --- | --- | | 156 | | | ? | 77 |   C**rossing** through the hundreds barrier and **bridging** through the tens barrier on a **number line**. 156 -77 = 79  -1 -6 -20 -50    79 80 86 106 156   |  |  | | --- | --- | | 132 | | | 95 | ? |   Understand how to solve subtraction problems when the two numbers are relatively close together, by counting on (***complementary addition***).  132    +2  +5 +30 = 37  95 100 130 132  **Relate subtraction to finding a difference**   |  |  | | --- | --- | | 230 | | | 180 | ? |   e.g. **How much less** is 180 than 230?  What is the **difference** between  230 and 180?  e.g. 230 – 180 (counting back)        50 -20 -30    180 200 230  230 - = 180  **Subtract a near multiple** of 10 (a nearly number) using **rounding and adjusting.**  96 – 39 = 57    -40  +1    56 57 96  **Expanded column subtraction,** including ***exchanging*.**  68 – 35    60 8  - 30 5  30 + 3 = 33  81 – 57    70 1  ~~80~~  1  - 50 7  20 + 4 = 24  381 – 157     1. 1   300 ~~80~~  1  - 100 50 7  200 + 20 + 4 = 224  **Expanded column subtraction,** including **exchanging.**  345 – 163    200 1  ~~300~~  40 5   * 100 60 3   100 + 80 + 2 = 182 |
| Pupils should be taught to:   * recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables * write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods * solve problems, including missing number problems, involving multiplication and division, including integer scaling problems and correspondence problems in which n objects are connected to m objects. | | |
| Multiplication strategies  **Multiplication as repeated addition**  +6 +6 +6 +6  0 6 12 18 24  **Multiplication as repeated addition using chunking**  13 x 3 =39  +30  (10x3) +3 +3 +3  0 30 33 36 39  **Multiplication as repeated addition using chunking**  13 x 3 =39  +30 +9  (10x3) (3x3)  0 30 39  **Multiplication** **using** **grid method** 13 x 3 = 39   |  |  |  | | --- | --- | --- | | x | 10 | 3  = 39 | | 3 | 30 | 9 |   (Children must be able to multiply by multiples of 10 using factors knowledge: 4 x 30 = 4 x 3 x 10 e.g. 4 x 3 = 12 x 10 = 120)    **Multiplication** **using** **grid method** 43 x 5   |  |  |  | | --- | --- | --- | | x | 40 | 3  = 215 | | 5 | 200 | 15 | | Division strategies  **Division as repeated addition (and the inverse- repeated subtraction)**  **Division as repeated addition** 35 ÷ 5 =7  1 2 3 4 5 6 7  +5 +5 +5 +5 +5 +5 +5  0 5 10 15 20 25 30 35  **Division as repeated subtraction**. 35 ÷ 5 =7  7 6 5 4 3 2 1  -5 -5 -5 -5 -5 -5 -5  0 5 10 15 20 25 30 35  **Division as repeated addition, using chunking**  52 ÷ 4 = 13  10 11 12 13  +40  (10x 4) +4 +4 +4 = 13  0 40 44 48 52  **Division as repeated subtraction, using chunking**  52 ÷ 4 = 13  13 12 11 10  -40  -4 -4 -4 (10x 4)  0 4 8 12 52 | |