**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.
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| 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

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| 100 |
| 37 | ? |

**Counting up** to solve **missing number problems** on a number line e.g. 37+ = 100+3 +60  =1004037

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| 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:**

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| 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

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| 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**

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| 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 = 3381 – 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.
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| 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

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|  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

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| 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 +50 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 -50 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 |