Year 5 Calculation Policy

- Addition – Mental Strategies
- Addition – Written Strategies
- Addition – Resources and Vocabulary
- Subtraction – Mental Strategies
- Subtraction – Written Strategies
- Subtraction – Resources and Vocabulary
- Multiplication – Mental Strategies
- Multiplication – Written Strategies
- Multiplication – Resources and Vocabulary
- Division – Mental Strategies
- Division – Written Strategies
- Division – Resources and Vocabulary
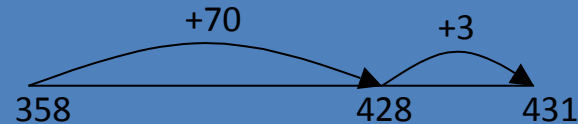
Alderman Richard Hallam Primary School

Addition – Mental Strategies and Jottings

NB. These should be done with increasingly large numbers e.g. 12462 + 2300 and numbers involving decimals

- Partition the smaller number into hundreds, tens and units and recombine e.g.

$$358 + 73 = 358 + 70 + 3$$
$$= 428 + 3$$
$$= 431$$

+70   +3
358   428   431

- Add the nearest multiple of 10, 100 or 1000 then adjust e.g.

$$458 + 79 = 458 + 80 - 1$$
$$2998 + 47 = 3000 + 47 - 2$$

- Find near doubles and adjust as needed e.g.

$$72 + 68 = (70 + 2) + (70 – 2)$$

Use of the bar model with multi-step problems

I win £200 in the lottery and decide to go shopping! I spent £79.99 in the first shop, £54.50 in the second and £24.50 in the third. How much of my lottery winnings do I still have?

£200			
?			?
£79.99	£54.50	£24.50	

Addition – Written Strategies

- Short column addition

Extend to numbers with *at least* four digits

$$32477$$
$$+\ 26842$$
$$\underline{59319}$$
$$\quad 1\ 1$$

Place value counters can continue to be used to support confident calculation with *decimals* and numbers with more than *4 digits* (see previous year exemplification).

Revert to expanded methods (see Year 4) if the children experience any difficulty.

Extend to up to two decimal places

$$265.74$$
$$+\ 132.35$$
$$\underline{398.09}$$
$$\quad 1$$

Addition – Vocabulary and Resources

Resources:

Place value counters

Base 10 for lower attainers

Vocabulary:

commutative, associative and distributive laws, exchanging, algorithm, Brackets, order of operations, BODMAS, aggregation, augmentation

Subtraction – Mental Strategies and Jottings

NB. These should be done with increasingly large numbers e.g. 12462 + 2300 and numbers involving decimals

- Find a difference by counting up e.g. 754 – 286 = 468

   This should be modelled on a blank number line and focus on counting forwards, not backwards.

- Subtract the nearest multiple of 10, 100 or 1000 and then adjust

   e.g. 928 – 203   = (928 – 200) -3

                                      = 728 – 3

                                      = 725

- Use known number facts and place value to subtract

   6.1 – 2.4 = 3.7

   3.7   4.1   6.1

   -0.4   -2
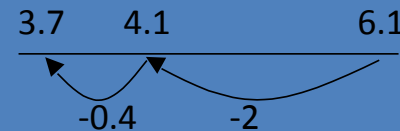
Use of the bar model

My shopping trip costs £175.45 in total. I spent £39.99 in the first shop, £54.50 in the third, how much did I spend in the second shop?

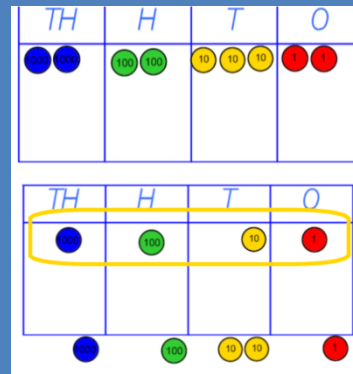| £175.45		
£39.99	?	£54.50

Subtraction – Written Strategies

- Expanded column subtraction where needed

   (use of place value counters or base 10)

   With exchanging

e.g. 2232 – 1121 =

$$2000 + 200 + 30 + 2$$
$$- 1000 + 100 + 20 + 1$$
$$1000 + 100 + 10 + 1$$
$$182$$

- Leading to short column subtraction

   (use of place value counters)

   8 12 1
   9 3 2
   - 4 5 7
   4 7 5

   2 17
   3 8 . 2
   - 2 8 . 7
   2 9 . 5

Subtraction – Vocabulary and Resources

Resources:

Base 10

Place value counters

Vocabulary:

Deduct, reduce by, remove, remains, left over, loss, discount, efficient, exchanging, commutative, associative and distributive laws, expanded method, algorithm, Brackets, order of operations, BODMAS, aggregation, augmentation

Multiplication – Mental Strategies and Jottings

- Children must know what prime, square, cube and composite (non-prime) numbers are.
    - Daily practise of primes, squares, cubes and times tables, forwards and backwards is recommended. This can be done in the line when walking into the classroom.
    - They should be able to establish whether a number up to 100 is prime and recall prime numbers up to 19
    - Pupils should recognise and use square ^{2} and cube ^{3} numbers

- When multiplying 3 numbers, they should multiply the largest two numbers first e.g. 2 x 7 x 5 = 2 x (7 x 5) = 2 x 35 = 70

- Children should be able to recognise the factor pairs for any given number

- Commutativity – children to explore place value and known times tables
    E.g. 3 x 200 = 600 can be derived from 3 x 2 = 6

Use of the bar model with problem solving
Abdi's bike cost £127.50. Ahmed buys a bike that cost 3 times as much as Abdi's, how much did Ahmed spend?

£127.50		

ALDERMAN RICHARD HALLAM

Multiplication– Written Strategies

- Short column multiplication when multiplying by one digit
(expanded method may be used where needed – see Year 4 Calculation Policy)

$$\begin{array}{r} 24 \\ \times\ 6 \\ \hline 144 \\ \hline \end{array}$$
$_2$

$$\begin{array}{r} 342 \\ \times\ 5 \\ \hline 1710 \\ \hline \end{array}$$
$_2$ $_1$

- Long column multiplication when multiplying by two digits

$$\begin{array}{r} 2\ 4 \\ \times\ 1\ 6 \\ \hline 1\ 4_2 4 \\ 2\ 4\ 0 \\ \hline 3\ 8\ 4 \\ \hline \end{array}$$

Units x top number
Tens x top number

Multiplication– Vocabulary and Resources

Vocabulary:

Resources:

Place value counters

- Product, multiplier, multiplicand, scaling, factors, ratio, non unit fractions, efficient, exchanging, commutative, associative and distributive laws, algorithm, brackets, order of operations, BODMAS, aggregation, LCM, prime/ square and cube numbers, powers
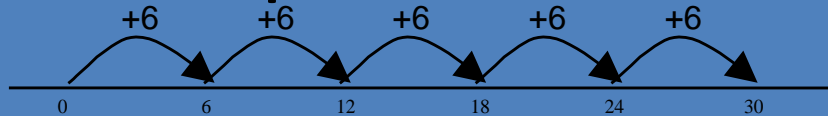
Division – Mental Strategies and Jottings
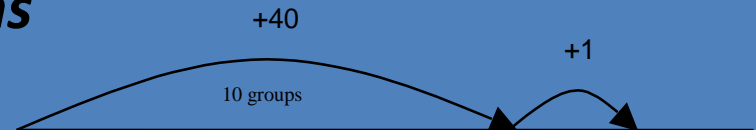
- Sharing and grouping to count **up**

30 ÷ 6 =   5

- Larger groupings of known number facts including remainders ***expressed as fractions***

41 ÷ 4 = (10 x 4) + 1 = 10 1/4 = 10.25

Use of the bar model with problems if applicable
There are 40 children in a class, 2/5 are girls, how many are boys?

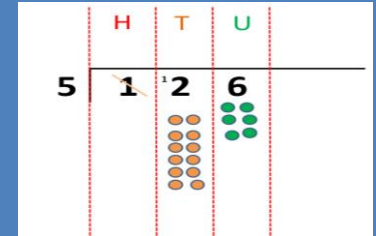| 40 children in total				
B	B	B	G	G
24 boys			16 girls	

Division – Written Strategies

- Bus stop method – short method when dividing by 1-digit numbers

Place value counters to support

e.g. $98 \div 7 =$ $7 \overline{) 9\,^2 8}$ $\begin{smallmatrix}1\ \ 4\end{smallmatrix}$ $432 \div 5 =$ $5 \overline{) 4\,^4 3\,^3 2}$ $0\ 8\ 6\,\tfrac{2}{5}$

- Bus stop method – long method when dividing by 2-digit numbers- put remainders as fractions.

e.g. $972 \div 36 =$

$$
\begin{array}{r}
27 \\
36 \overline{)\ 972} \\
-\ 720 \\
\hline
252 \\
-\ 252 \\
\hline
0
\end{array}
$$

($\underline{20}$ x 36)

($\underline{7}$ x 36)

($\underline{=27}$)

Encourage children to jot down known number facts
e.g. 1 x 36 = 36
2 x 36 = 72
5 x 36 = 180
10 x 36 = 360
20 x 36 = 720

Division – Vocabulary and Resources

Resources:

Place value counters

Vocabulary:

- Dividend, divisor, quotient, remainder, left over, rules of divisibility, divisible by, factors, multiple, ratio, non unit fractions, efficient, exchanging, commutative, associative and distributive laws, algorithm, Brackets, order of operations, BODMAS, LCM, prime/ square and cube numbers, augmentation

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