We aim for all Lowbrook Children to be able to:

- *Develop mathematical fluency*
- *Reason mathematically*
- *Problem solve*
- *Make connections across mathematical ideas*
- *Apply knowledge in other subject areas*

MATHS INFORMATION BOOKLET

YEAR 3

YEAR 3 STRATEGIES

Here are the strategies that you can use to help develop your child's addition, subtraction, multiplication and division skills.
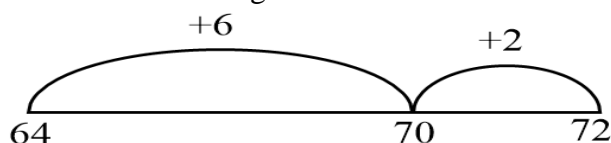
ADDITION

Counting on using mental methods

Bridging (Counting on to the next multiple of 10 then adding on)

For example 64 + 8   45 + 7   48 + 5
64 + 8 by adding 6 to make 70 and then adding 2
45 + 7 by adding 5 to make 50 and then adding 2
48 + 5 by adding 2 to make 50 and then adding 3

Number lines can help children with mental calculation speed and gives them a better understanding of number. They can chose the size of the jumps and numbers can be added in any order.

By adding multiples of 10 to a number

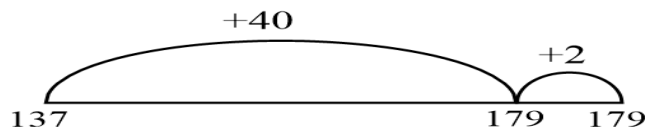### First add multiples of 10 followed by the ones

137 add 42 by counting on in tens 137 147 157 167 177 add 2
145 add 56 by counting on in tens 145 155 165 175 185 195 add 6
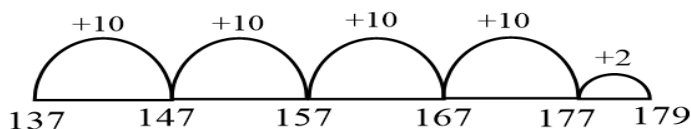
By adding multiples of 10's and then adjusting

137 + 42 by adding 40 and then add two.

37 + 27 by adding 30 and then taking away three
37 + 30 = 67   67 - 3 = 64
124 + 48 by adding 50 and then taking away two.
124 + 50 = 174   174 – 2 = 172

Partitioning to help with addition.

Calculation   74 + 58 =
                     / \ / \
                   70 4 50 8
Add the tens then the ones to the first number.
  70 + 50 = 120
   4 + 8 = 12
120 + 12 = 132

Column addition

H	T	O
6	4	3
$_+$ 2	5	4
8	9	7

H	T	O
4	6	4
+ 3	4	7
8	1	1
	X̶	X̶

When carrying place number underneath the calculation and cross out once added. Remind your child the actual value in this calculation in the tens column is sixty add forty but we say six add four because it is already in the tens column.

Key vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, ones, partition, plus, addition, column, tens boundary, hundreds boundary, increase, vertical, carry, expanded, compact, inverse

Key skills for addition at Year 3:
• Read and write numbers to 1000 in numerals and words.
• Add 2-digit numbers mentally, including those with a total exceeding 100.
• Add a three-digit number and ones mentally (175 + 8).
• Add a three-digit number and tens mentally (249 + 50).
• Add a three-digit number and hundreds mentally (381 + 400).
• Estimate answers to calculations, using inverse to check answers.
• Solve problems, including missing number problems, using number facts, place value, and more complex addition.
• Recognize place value of each digit in 3-digit numbers (hundreds, tens, ones).
• Continue to practice a wide range of mental addition strategies, i.e. number bonds, adding the nearest multiple of 10, 100, 100 and adjusting, using near doubles, partitioning and recombining.
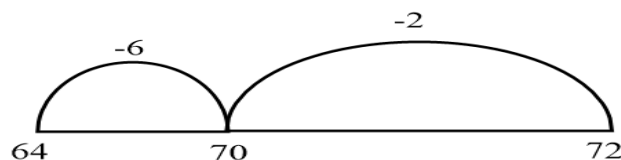
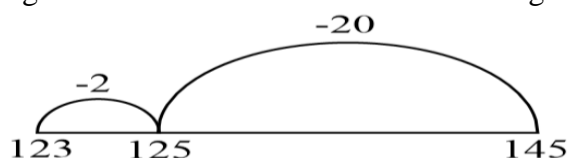## SUBTRACTION

Counting back in your head

Put the larger number in your head and count back. For example what is 137 take away 8?
Put 137 in your head and count back 8.

Subtracting by bridging to the previous multiple of 10 and then counting back

72 - 8 by subtracting 2 to give 70 and then subtract the remaining 6

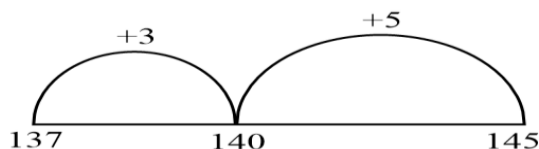145 – 22 by subtracting 20 to give 125 and then subtract the remaining 2

Subtraction by Counting On:
145 – 8 = 137
137 + 3 = 140
140 + 5 = 145

Subtraction by counting on is effective for two numbers with a small difference between them.

Partitioning to help with subtraction

Calculation   65 - 3 2 =
                   / \   / \
                60 5   30 2
Only partition the <u>second</u> number
Take away the tens then take away the ones from that number.
60 - 30 = 30
 5 – 2 = 3
30 + 3 = 33

Column Subtraction – Decomposition

974 – 655 = 319

H	T	O
9	6 $\not7$	1 4
- 6	5	5
3	1	9

When the top ones digit cannot subtract the lower digit, take a ten from the tens column and cross out one ten to show it has been used. Remind your child the actual value in the tens column is seventy take away sixty but we say seven take away six because it is already in the tens column. Same applies in the hundreds column which is nine hundred take away six hundred but we say nine take away six as it is already in the hundreds column.

Key vocabulary: equal to, take, take away, less, how many more, how many / less than, back, how many left, how much less is? count on, tens, ones, value, digit, inverse, exchange, decrease.

Key skills for subtraction at Year 3:
• Subtract mentally a: 3-digit number and ones, 3-digit number and tens, 3-digit number and hundreds.
• Estimate answers and use inverse operations to check.
• Solve problems, including missing number problems.
• Find 10 or 100 more or less than a given number.
• Recognize the place value of each digit in a 3-digit number.
• Counting up differences as a mental strategy when numbers are close together or near multiples of 10 (see examples above).
 • Read and write numbers up to 1000 in numerals and words.
• Practice mental subtraction strategies, such as subtracting near multiples of 10 and adjusting (e.g. subtracting 19 or 21), and select most appropriate methods to subtract, explaining why.

MULTIPLICATION

Counting on in 2's, 3's, 4's, 5's, 6's, 8,s 10's, 50's and 100's from any number

Repeated addition
For example: 6 x 8 = 6 + 6+ 6 + 6 + 6 + 6 + 6 + 6

Knowing 2, 3, 4, 5, 6 and 8 times tables

Recite the times tables and then ask different questions such as

- If I have 9 5p coins how much do I have?

- If I have 30p in 10p coins how many coins do I have?

- What is 8 multiplied by six?

- How many 6's make 42?

Doubling the answers to find another answer

For example to find out 7 x 4 find 7 x 2 and then double the answer.
To find 20 x 7 find 10 x 7 and then double it.

Multiplying by partitioning

Calculating 24 x 4 by partitioning 20 and 4 and working out 20 x 4 and then 4 x 4 and then adding them together.

X	20	4
4	80	16

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    8 0
+   1 6
    9 6
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Key vocabulary: groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, times, times as big as, once, twice, thrice, times..., partition, grid method, multiple, product, tens, ones, value, inverse.

Key skills for multiplication at Year 3:
• Recall and use multiplication facts for the 2, 3, 4, 5, 8 and 10 multiplication tables, and multiply multiples of 10.
• Write and calculate number statements using the multiplication tables they know, including 2-digit x single-digit, drawing upon mental methods, and progressing to reliable written methods.
• Solve multiplication problems, including missing number problems.
• Develop mental strategies using commutative law e.g. 4 x 12 x 5 = 4 x 5 x 12 = 20 x 12 = 240.
• Solve simple problems in contexts, deciding which operations and methods to use.
• Develop efficient mental methods to solve a range of problems and for missing number problems.

DIVISION

Division as sharing

24 crayons are divided equally between 3 pots. How many crayons are there in each pot?
e.g. 24 ÷ 3 = 8
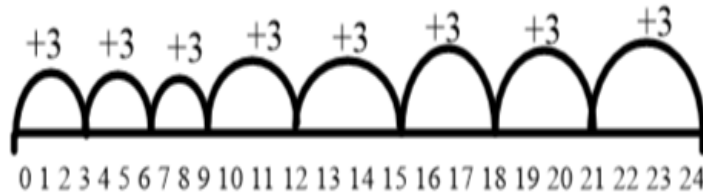
Division by partitioning

Calculating 96 ÷ 3 by partitioning 96 to 90 and 6 and dividing each part by 3 to get the answer 32

$$90 \div 3 = \ 30$$
$$6 \div 3 = \ \underline{\ 2} +$$
$$3\ 2$$

Try and encourage your child to explain what they are doing and talk through how they are working out the answers.

Encourage your child to jot down their workings out and to draw pictures or diagrams to help make sense of a problem.

Give your child a number problem to solve.

Talk through the question and ask your child which operation is needed to solve the problem.

For example:

Jake wants to buy a comic costing £1. He saves 25p one week and 40p the next. How much more money does he need to buy the comic?

A piece of tape is 100cm long. I cut off 7 pieces each 5cm long, how much tape is left?

Short division
Once the children are secure with division as sharing/grouping and can demonstrate this using number lines, short division for larger 2 digit numbers should be introduced, initially with carefully selected examples requiring no calculation of remainders at all.

Remind children of correct place value (96 is 90 + 6) but work across each column:
In the 10s column, how many 3s in 9? Record in 10s column. In the 1s column, how many 3s in 6? Record in 1s column. Knowledge of table facts makes this much easier!
e.g. 96 ÷ 3

Once children demonstrate an understanding of the short division method, introduce the concept of remainders with examples where the remainder occurs within the calculation. Teach the children to 'carry' the remainder to the next digit.
e.g. $72 \div 4$

$7 \div 4 = 1$ remainder 3.
Carry the 3 to make 32.
$32 \div$ by $4 = 8$
$72 \div 4 = 18$

$$4 \overline{)\, 7^3 2}^{\,1\,8}$$

Key Vocabulary: share, share equally, one each, two each…, group, equal groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, 'carry', remainder, multiple, dividend

Key number skills needed for division at Year 3:
• Recall and use multiplication and division facts for the 2, 3, 4, 5, 8 and 10 multiplication tables (through doubling, connect the 2, 4 and 8s).
• 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, in contexts, and including missing number problems, involving multiplication and division.
• Pupils develop efficient mental methods, for example, using multiplication and division facts (e.g. using $3 \times 2 = 6$, $6 \div 3 = 2$ and $2 = 6 \div 3$) to derive related facts ($30 \times 2 = 60$, so $60 \div 3 = 20$ and $20 = 60 \div 3$).
• Pupils develop reliable written methods for division, starting with calculations of 2-digit numbers by 1-digit numbers and progressing to the formal written method of short division.

FRACTIONS

Adding Fractions and Subtracting Fractions

The top numbers in a fraction are called **numerators** and the bottom numbers are called the **denominators**.

Add the top numbers (the numerators), put that answer over the denominator.
e.g.

$$\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$$

When subtracting, take away second numerator from the first numerator and put that answer over the denominator.
e.g.

$$\frac{2}{5} - \frac{1}{5} = \frac{1}{5}$$

Finding a fraction of an amount

To find a fraction of an amount divide the number by the denominator and then multiply the answer by the numerator.

e.g.

$$\frac{1}{8} \text{ of } 24 = 3$$

$$24 \div 8 = 3 \quad 3 \times 1 = 3$$

Key vocabulary fractions: divide, denominator, numerator, times, equals, fraction, amount, add, subtract.

At Lowbrook, we teach children a range of techniques and they can choose which method works best for them.
You may also like to access the Holylowbrook You Tube Channel where you can see many of the methods we use in year 3 demonstrated by our own staff.

Using Mymaths (mymaths.co.uk) for homework has made it possible for you to watch all methods of calculation we use in year 3, before your child attempts the task set.

Games to play with your children to support mathematical understanding.

Uno   Recognizing and matching numbers.
Dominoes   Supporting counting and associating patterns with numbers.
Top Trumps.   Reading and using large numbers.
Playing cards   Addition and grouping.
Yahtzee   Good game for adding, multiplication and probability.
Chess/Draughts   Strategy and logical thinking.

Useful Websites.
https://www.topmarks.co.uk/
https://www.bbc.co.uk/bitesize/subjects/z6vg9j6
https://www.theschoolrun.com/
https:/wwwmathsphere.co.ukresources.