



# Lowbrook Academy

*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 4**

## Year 4 Strategies

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

### MENTAL ADDITION AND SUBTRACTION STRATEGIES

#### Find the difference by counting up through the next multiple of 10, 100 or 1000

Work out by counting up from the smaller to the larger number.

92 - 89, 403 - 386 and 4000 - 3993

Use a number line.

#### Count on or back in steps of 1, 10, 100 or 1000

For example work out mentally that:

$2003 - 8 = 1995$  by counting back in ones from 2003

$643 + 50 = 693$  by counting on in tens from 643

$387 - 50 = 337$  by counting back in tens from 387

$460 + 500 = 960$  by counting on in hundreds from 460

#### Partition into Hundreds, Tens and Ones

For example work out mentally that:

$24 + 58 = 82$  because it is  $20 + 50 = 70$  and  $4 + 8 = 12$  making  $70 + 12 = 82$ .

#### Identify near doubles

• For example work out mentally that:

$38 + 36 = 74$ ; you can double 40 then subtract 2 and subtract 4 or double 37.

•  $160 + 170 = 330$

You can add two 160s plus 10, or two 170s minus 10

#### Add or Subtract the nearest multiple of 10, 100 or 1000 and adjust

##### Add 9, 19, 29 or 11, 21, 31...to any two digit number

•  $63 + 29 = 92$  Because it is the same as  $63 + 30 - 1$

•  $58 + 71 = 129$  Because it is the same as  $58 + 70 + 1$

•  $74 + 58 = 132$  Because it is  $74 + 60 = 134$  then subtract 2 = 132

#### Add several numbers

Using strategies such as

• Looking for pairs that make 10 or 100

$1 + 3 + 6 + 9 + 7 = \underline{\quad}$  is the same as;  $9 + 1 = 10$ ,  $7 + 3 = 10$ ,  $10 + 10 = 20 + 6 = 26$

• Starting with the largest number

$40 + 90 + 60 = \underline{\quad}$ ;  $60 + 40 = 100$   $100 + 90 = 190$

• Looking for pairs that make 9 or 11 and adding these to the total by adding ten and then adjusting by one

$5 + 3 + 11 = \underline{\quad}$ ;  $5 + 3 = 8$ ,  $8 + 10 = 18$ ,  $18 + 1 = 19$

- Looking for near doubles  
 $12 + 13 + 15 = \underline{\quad}$ ;  $12 + 12 + 1 + 15 = 40$

**Use known number facts to Add or Subtract a pair of numbers**

**Add or Subtract two digit multiples of 10**

- $42 + 73 = \underline{\quad}$ ;  $40 + 70 + 2 + 3 = 115$
- $130 - 56 = \underline{\quad}$ ;  $130 - 50 - 6 = 74$

**Add or Subtract a pair of multiples of 100 crossing 1000**

- $525 + 705 = \underline{\quad}$ ;  $500 + 700 + 25 + 5 = 1230$
- $1200 - 450 = \underline{\quad}$ ;  $1200 - 400 - 50 = 750$

**Find what to add to a two or a three digit number to make the next 100 or multiple of a hundred using number line.**



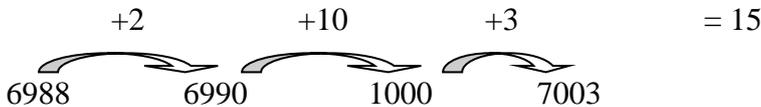
- $58 + \underline{\quad} = 100$   $58 + 2 = 60$   $60 + 40 = 100$   $58 \quad 60 \quad 100 \quad = 42$

**Find what to add to four digit number to make the next 1000 or multiple of 1000.**

- $3200 + \underline{\quad} = 4100$   $3200 + 800 = 4000$   $4000 + 100 = 4100$  Answer =  $800 + 100 = 900$
- $8400 + \underline{\quad} = 9000$

**Find the difference between a pair of numbers by counting up.**

- $7003 - 6988 = 15$  by counting up 2 from 6988 to 6990 then 10 to 7000 then 3 to 7003.



Children should be able to explain the method that they have used. They will be progressing to using a number line to count back through zero to include negative numbers.

For example  $3 - 4 = -1$  by counting back 4 places.



Children should know square numbers up to and including 12.

Children should be able to read and write Roman Numerals to 100.

**ADDITION**

Children should be able to use written methods to support, record or explain calculations, achieving consistent accuracy. Encourage them to discuss, explain and compare different methods.

When using written methods that are set out in columns, remind the children that the ones should line up under ones, tens under tens etc.

**Column Addition**

|  |    |   |   |   |
|--|----|---|---|---|
|  | Th | H | T | O |
|  | 4  | 2 | 4 | 6 |
|  | 2  | 3 | 2 | 3 |
|  | 6  | 5 | 6 | 9 |

|   |    |   |   |   |
|---|----|---|---|---|
|   | Th | H | T | O |
|   | 4  | 7 | 3 | 4 |
| + | 5  | 1 | 9 | 6 |
|   | 9  | 9 | 3 | 0 |

When adding decimals, such as pounds and pence use the methods below. Remind children that the decimal points should line up under each other, particularly when adding or subtracting mixed amounts such as £3.59 + 78p

|          |            |             |              |
|----------|------------|-------------|--------------|
|          | <b>0</b>   | <b>1/10</b> | <b>1/100</b> |
|          | <b>3 .</b> | <b>5</b>    | <b>9</b>     |
| <b>+</b> | <b>0 .</b> | <b>7</b>    | <b>8</b>     |
| <b>£</b> | <b>4 .</b> | <b>3</b>    | <b>7</b>     |

**Key vocabulary:** add, plus, and, total, equal to, count on, number line, sum, tens, plus, tens boundary, hundreds boundary, increase, vertical, 'carry', expanded, compact, thousands, hundreds, inverse, digits.

**Key skills for addition at Year 4:**

- Select most appropriate method: mental, jottings or written and explain why.
- Recognise the place value of each digit in a four-digit number.
- Round any number to the nearest 10, 100 or 1000.
- Estimate and use inverse operations to check answers.
- Find 1000 more or less than a given number.
- Continue to practice a wide range of mental addition strategies, i.e. number bonds, add the nearest multiple of 10, 100, 1000 and adjust, use near doubles, partitioning and recombining.
- Add numbers with up to 4 digits using the formal written method of column addition.
- Solve 2-step problems in contexts, deciding which operations and methods to use and why.
- Estimate and use inverse operations to check answers to a calculation.

**SUBTRACTION**

**Column Subtraction-Decomposition and Decimals.**

It is helpful to put the place values above the calculations so the children understand the value of each digit. For example, when they take a ten from the tens column in the second calculation shown, they realise it is a 10 and when they cross out the digits to show twenty take away ten they should understand it is not two takeaway one. The same applies to decimal places of tenths and hundredths.

|          |           |          |          |          |
|----------|-----------|----------|----------|----------|
|          | <b>Th</b> | <b>H</b> | <b>T</b> | <b>O</b> |
|          | <b>3</b>  | <b>7</b> | <b>6</b> | <b>4</b> |
| <b>-</b> | <b>1</b>  | <b>2</b> | <b>3</b> | <b>2</b> |
|          | <b>2</b>  | <b>5</b> | <b>3</b> | <b>2</b> |

|          |           |          |                     |           |
|----------|-----------|----------|---------------------|-----------|
|          | <b>Th</b> | <b>H</b> | <b>T</b>            | <b>O</b>  |
|          | <b>4</b>  | <b>6</b> | <del><b>2</b></del> | <b>12</b> |
| <b>-</b> | <b>2</b>  | <b>1</b> | <b>1</b>            | <b>3</b>  |
|          | <b>2</b>  | <b>5</b> | <b>1</b>            | <b>9</b>  |

|          |                              |             |              |
|----------|------------------------------|-------------|--------------|
|          | <b>0</b>                     | <b>1/10</b> | <b>1/100</b> |
|          | <del><b>2</b></del> <b>.</b> | <b>15</b>   | <b>9</b>     |
| <b>-</b> | <b>0 .</b>                   | <b>7</b>    | <b>8</b>     |
|          | <b>2 .</b>                   | <b>8</b>    | <b>1</b>     |

**Key vocabulary:** equal to, take, take away, less, how many more / less than, count back, how many left, how much less is, count on, strategy, partition, tens, units digit, inverse.

### Key skills for subtraction at Year 4:

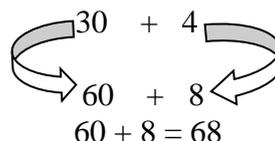
- Subtract by counting on where numbers are close together or they are near to multiples of 10, 100 etc.
- Children select the most appropriate and efficient methods for given subtraction calculations.
- Estimate and use inverse operations to check answers.
- Solve addition and subtraction 2-step problems, choosing which operations and methods to use and why.
- Solve simple measure and money problems involving fractions and decimals to two decimal places.
- Find 1000 more or less than a given number.
- Count backwards through zero, including negative numbers.
- Recognise place value of each digit in a 4-digit number.
- Round any number to the nearest 10, 100 or 1000.
- Solve number and practical problems that involve the above, with increasingly large positive numbers.

## MULTIPLICATION

### Doubling and Halving

Use related facts for doubling or halving.

- For example double 34 is double 30 add double 4



- Half of 56 is half of 50 plus half of 6

**To multiply by 4, double and double again.**

- For example to work out  $12 \times 4$ ; double  $12 = 24$ , double  $24 = 48$

**To multiply by 5, multiply by 10 and then halve it.**

$$\begin{aligned} \text{For example } 14 \times 5 &= 14 \times 10 \\ &= 140 \\ &= 140 \div 2 \\ &= 70 \end{aligned}$$

**To multiply by 20, multiply by 10 and then double.**

$$\begin{aligned} \text{For example } 15 \times 20 &= 15 \times 10 \\ &= 150 \\ \text{Double } 150 &= 300 \end{aligned}$$

**Explain how to find quarters and eighths by halving.**

- For example, one eighth of 64 is 8 because half of 64 is 32, half again is 16 and half again is 8.

**Partition and then multiply**

- Begin to multiply a two digit number by a single digit number, multiplying the tens first for example  
 $32 \times 3 = (30 \times 3) + (2 \times 3)$   
 $= 90 + 6$   
 $= 96$

## Grid Method

For example  $23 \times 8$  is approximately  $20 \times 10 = 200$ , this gives you an idea that your answer should be nearly this number.

|          |          |            |           |
|----------|----------|------------|-----------|
|          | <b>x</b> | <b>20</b>  | <b>3</b>  |
| <b>8</b> |          | <b>160</b> | <b>24</b> |

$$\begin{array}{r} 160 \\ + 24 \\ \hline 184 \end{array}$$

## Short multiplication.

For example

|            |          |          |
|------------|----------|----------|
|            | <b>2</b> | <b>3</b> |
| <b>x</b>   |          | <b>7</b> |
| <b>161</b> |          |          |

$\swarrow$

**Key vocabulary:** groups of, lots of, sets of, times, array, altogether, multiply, count, multiplied by, repeated addition, array, column, row, commutative, equal groups, as big as, once, twice, three times... partition, grid method, total, multiple, product, inverse.

## Key skills for multiplication at Year 4:

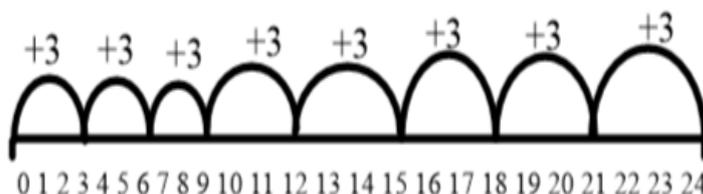
- Count in multiples of 6, 7, 9, 25 and 1000.
- Recall multiplication facts for all multiplication tables up to  $12 \times 12$ .
- Recognise place value of digits in up to 4-digit numbers.
- Use place value, known facts and derived facts to multiply mentally, e.g. multiply by 1, 10, 100, by 0, or to multiply 3 numbers.
- Use commutative law and other strategies mentally  $2 \times 6 \times 5 = 10 \times 6$ ,  $39 \times 7 = 30 \times 7 + 9 \times 7$ .
- Solve problems with increasingly complex multiplication in a range of contexts.
- Solve problems involving scaling e.g. if 2 children have 3 cakes, how many will 6 children have?

## DIVISION

### Sharing, Grouping and using a number line.

Children explore division as sharing and grouping, and to represent calculations on a number line until they have a secure understanding.

e.g.  $24 \div 3 = 8$



### Short division with exact answers and 3 digits with remainders.

e.g.  $96 \div 3 = 32$   
 $872 \div 4 = 218$

$$\begin{array}{r} 32 \\ 3 \overline{) 96} \\ \underline{96} \\ 0 \end{array} \qquad \begin{array}{r} 218 \\ 4 \overline{) 872} \\ \underline{8} \phantom{0} \\ 7 \phantom{0} \\ \underline{72} \\ 0 \end{array}$$

Children need to be secure with the process of short division of 2 digits before they progress to 3 digit numbers. They can then progress to division where they need to understand how to calculate remainders and use them to 'carry' remainders in the calculation process.

For example in the above 3-digit calculation by dividing 7 by 4 the answer will be 1 remainder 3. The children should understand how to carry the 3 and place it with the 2 making 32 and then divide by 4 giving the final answer of 218.

**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, divisible by, factor.

### Key number skills needed for division at Year 4:

- Recall multiplication and division facts for all numbers up to  $12 \times 12$ .
- Use place value, known and derived facts to multiply and divide mentally, including: multiplying and dividing by 1, 10 and 100.
- Pupils practice to become fluent in the formal written method of short division with exact answers when dividing by a one-digit number.
- Pupils practice mental methods and extend this to three-digit numbers to derive facts, for example  $200 \times 3 = 600$  so  $600 \div 3 = 200$ .
- Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as three cakes shared equally between 10 children.

Give your child a number problem to solve. Talk through the question and ask your child to figure out which part or parts of the calculation is addition, subtraction, multiplication or division.

For Example

- On a school trip 72 people visit a museum. There are 53 children and 7 teachers, the rest are parents. How many parents are there?
- In a week John saves £1.75, on Monday he has 55p and on Wednesday he has 75p. How much does he save the rest of the week?
- My shampoo bottle holds 400ml of shampoo. If I use 20ml each time I wash my hair, how many washes will I get from the bottle?
- My parents borrowed money to buy a house. Each month they pay the bank £650. How much will they have paid the bank after 10 years?

## FRACTIONS

### Adding Fractions and Subtracting Fractions

Top numbers in a fraction are called numerators and bottom numbers are called the denominators. Add the top numbers (the numerators) and 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.

$$\frac{3}{8} \text{ of } 40 = 15$$

$$40 \div 8 = 5$$

$$5 \times 3 = 15$$

### Finding equivalent fractions

Equivalent fractions are fractions which have the same value. They are **equal**.

You can make equivalent fractions by multiplying or dividing **both the numerator and the denominator** by the same amount. You only multiply or divide, **never add or subtract**, to get an equivalent fraction. Remember to only divide when the numerator and denominator would still be whole numbers.

e.g.

$$\frac{1}{2} \stackrel{(x2)}{=} \frac{2}{4} \stackrel{(x2)}{=} \frac{4}{8}$$

$$\frac{18}{36} \stackrel{(x2)}{=} \frac{6}{12} \stackrel{(x2)}{=} \frac{1}{2}$$

OR

$$\frac{18}{36} \stackrel{(\div 3)}{=} \frac{6}{12} \stackrel{(\div 6)}{=} \frac{1}{2}$$

### Conversion

Fractions and decimals are all closely linked and can be converted (changed) to be each other. So a **fraction** can be converted into a decimal and a **decimal** can be converted into a fraction. Children in year 4 should know the following facts.

## Conversion Facts

| Fraction       | Decimal |
|----------------|---------|
| $\frac{1}{2}$  | 0.5     |
| $\frac{1}{4}$  | 0.25    |
| $\frac{3}{4}$  | 0.75    |
| $\frac{1}{5}$  | 0.2     |
| $\frac{1}{10}$ | 0.1     |

**Key vocabulary fractions:** divide, denominator, numerator, times, equals, fraction, amount, equivalent value, add, subtract, multiply, convert, decimal, quarter, tenth, hundredth, fifth, decimal point.

At Lowbrook we aim to equip the children with a range of techniques and various methods of problem solving to enable them to choose which strategies they prefer to use. Our aim is for all our children to develop resilience and independence and to have confidence in their own abilities.

### **Magma Maths**

Using Magma Maths for homework have made it possible for you to watch all methods of calculations we use in Year 4. It improves mathematical understanding providing interactive learning with instant feedback and allows children to show their thinking on a digital canvas.

### **Purple Mash**

Purple Mash is daily homework so that children can practice their Times Tables.

### **Games to play with your children to support mathematical understanding.**

|                |                                                            |
|----------------|------------------------------------------------------------|
| Uno            | Recognizing and matching numbers.                          |
| Dominoes       | Supporting counting and associating patterns with numbers. |
| TT rockstar    | Practicing of X Tables                                     |
| 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.                             |
| Rummikub       | Addition, multiplication and strategy                      |

Useful Websites.

<https://www.topmarks.co.uk/>

<https://www.bbc.co.uk/bitesize/subjects/z6vg9j6>

<https://www.theschoolrun.com/>

<https://www.mathsphere.co.uk/resources>.

<https://trockstars.com/>