



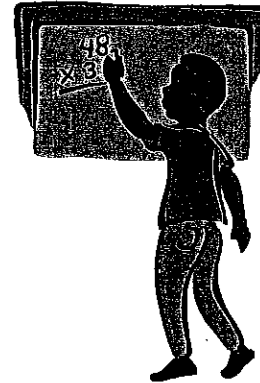
# Cottesbrooke Infant School

# Maths



# Calculation Policy Guidance





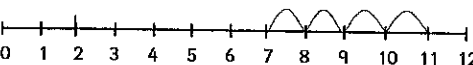
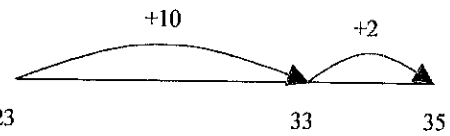
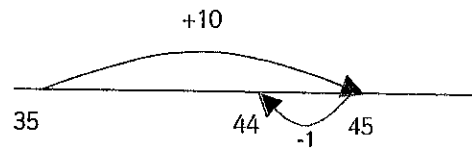

10 5 54  
7 26 18



By Operation

# Cottesbrooke Infant School Calculation Policy Guidance 08

## Addition +

Nursery	Reception	Year 1	Year 2						
<p><b>(PTP Calculation 1) Responds to the vocabulary involved in addition and subtraction in rhymes and games</b></p> <p><u>Number rhymes and songs</u>                      5 little ducks                      5 little monkeys                      5 Little men                      12345 fish alive                      Ring a ring a roses</p> <p><b>(PTP Calculation A) Shows interest in number problems</b></p> <p><u>Role play</u>                      Sharing out cakes                      Counting farm animals                      Setting the table – plates, cups, places etc.                      Drinks time</p> <p><b>(PTP Calculation B) Separates a group of 3 or four objects in different ways, beginning to recognise that the total is still the same</b></p> <p>Counting out kiddie counters, teddies, dinosaurs, fruit, shapes etc.</p> <p><b>(PT Calculation 2) Recognises differences in quantity when comparing sets of objects)</b></p> <p>Comparing sand and water pots                      Kiddie counters, teddies, dinosaurs, fruit etc.                      Role play</p> <p><b>(PTP Calculation C) Uses own methods to work through problems</b></p> <p>Practical Activities and Role play</p> <p><b>(PTP Calculation D) Finds the total number of items in two groups by counting all of them</b></p> <p><u>Practical activities</u>                      Kiddie counters, teddies, dinosaurs, fruit, shapes etc.</p> <p><u>Role play</u>                      Counting out plate plates and cups                      Structured number activities (adult led) e.g. counting games, assessment</p> <p><b>(PTP Calculation 3) Finds one more or less from a group of up to five objects</b></p> <p>Threading beads and shapes                      Using Wooden number boats                      Fishing game</p>	<p><b>Number rhymes</b>                      2 Little Dicky birds                      Flower song</p> <p><b>Role play activities</b>                      Throw at targets and add numbers                      1 in the bed and add more up to 10                      Fishing game add numbers</p> <p><b>Addition games</b>                      Throw 2 dice and build a tower                      Shoe game</p> <p><b>Addition practically with apparatus</b>                      Teddies, unifix etc.</p> <p><b>Picture addition with notation then without</b></p> <div style="text-align: center;">  <p>2 + 3 =</p> </div> <p><b>Adding one more</b>                      Counting forward practically or using charts</p> <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th style="width: 50%;">Draw one more</th> <th style="width: 50%;">How many now?</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">  </td> <td></td> </tr> <tr> <td style="height: 40px;"></td> <td></td> </tr> </tbody> </table>	Draw one more	How many now?					<p><b>Number bonds to 10</b>  <u>Pictures / marks</u>                      Ann had 1 rugby ball and 2 footballs. How many balls does she have altogether?</p> <div style="text-align: center;">  <p>1 + 2 = <input style="width: 20px; height: 20px;" type="text"/></p> </div> <p><b>Number lines (numbered)</b></p> <div style="text-align: center;">  </div> <p>Recording by - drawing jumps on prepared lines</p> <ul style="list-style-type: none"> <li>○ constructing own lines</li> </ul> <p>( Teacher model number lines with missing numbers)</p> <p><i>(Teachers model jottings appropriate for larger numbers)</i></p> <p><b>Number Squares in 10's</b>                      Adding 10's – going down number a square                      Adding 1 - is number after</p> <p><b>+ = signs and missing numbers</b></p> <div style="display: flex; justify-content: space-around;"> <div> <p>3 + 4 = <input style="width: 20px;" type="text"/></p> <p>3 + <input style="width: 20px;" type="text"/> = 7</p> <p><input style="width: 20px;" type="text"/> + 4 = 7</p> <p><input style="width: 20px;" type="text"/> + <input style="width: 20px;" type="text"/> = 7</p> </div> <div> <p><input style="width: 20px;" type="text"/> = 3 + 4</p> <p>7 = <input style="width: 20px;" type="text"/> + 4</p> <p>7 = 3 + <input style="width: 20px;" type="text"/></p> <p>7 = <input style="width: 20px;" type="text"/> + <input style="width: 20px;" type="text"/></p> </div> </div> <p>Promoting covering up of operations and numbers.</p> <p><b>Practical</b>                      Role play, using fingers, unifix, counters etc.</p>	<p><b>Number bonds to 20</b>                      Any shape used for missing symbol or sign, e.g. <input style="width: 20px;" type="text"/></p> <p><b>+ = signs and missing numbers</b>                      Continue using a range of equations as in Year 1 but with appropriate, larger numbers.                      Extend to                      14 + 5 = 10 + <input style="width: 20px;" type="text"/>                      and adding three numbers                      32 + <input style="width: 20px;" type="text"/> + <input style="width: 20px;" type="text"/> = 100    35 = 1 + <input style="width: 20px;" type="text"/> + 5</p> <p><b>Partition into tens and ones and recombine</b></p> <div style="text-align: center;"> <p>12 + 23 = 10 + 2 + 20 + 3</p> <p>= 30 + 5</p> <p>= 35</p> </div> <p>Refine to partitioning the second number only:</p> <div style="text-align: center;"> <p>23 + 12 = 23 + 10 + 2</p> <p>= 33 + 2</p> <p>= 35</p>  </div> <p>Add 9 or 11 by adding 10 and adjusting by 1                      35 + 9 = 44</p> <div style="text-align: center;">  </div>
Draw one more	How many now?								
									

Year 3

**Addition +**

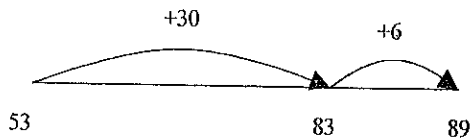
+ = signs and missing numbers

Continue using a range of equations as in Year 1 and 2 but with appropriate, larger numbers.

Partition into tens and ones and recombine

Partition both numbers and recombine. Refine to partitioning the second number only e.g.

$$\begin{aligned} 36 + 53 &= 53 + 30 + 6 \\ &= 83 + 6 \\ &= 89 \end{aligned}$$



Add a near multiple of 10 to a two-digit number

Continue as in Year 2 but with appropriate numbers

e.g.  $35 + 19$  is the same as  $35 + 20 - 1$ .

Pencil and paper procedures

$83 + 42 = 125$

	<u>G&amp;T</u>	
$\begin{array}{r} 80 + 3 \\ +40 + 2 \\ 120 + 5 = 125 \end{array}$	$\begin{array}{r} 83 \\ + 42 \\ 120 \\ \underline{5} \\ 125 \end{array}$	$\begin{array}{r} 83 \\ + 42 \\ 120 \\ \underline{5} \\ 125 \end{array}$

**Subtraction -**

- = signs and missing numbers

Continue using a range of equations as in Year 2 but with appropriate numbers.

Find a small difference by counting up

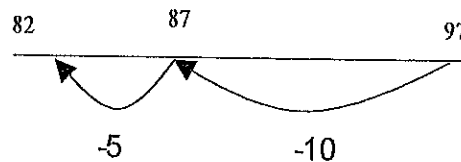
Continue as in Year 2 but with appropriate numbers e.g.  $102 - 97 = 5$

Subtract mentally a 'near multiple of 10' to or from a two-digit number

Continue as in Year 2 but with appropriate numbers e.g.  $78 - 49$  is the same as  $78 - 50 + 1$

Use known number facts and place value to subtract

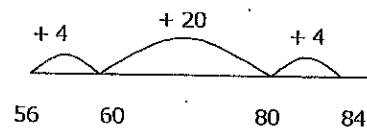
Continue as in Year 2 but with appropriate numbers e.g.  $97 - 15 = 72$



Pencil and paper procedures

Complementary addition

$84 - 56 = 28$



**Multiplication x**

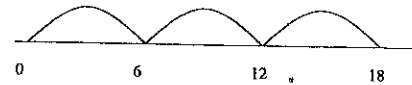
Multiplication tables x2 x3 x5 x10

x = signs and missing numbers

Continue using a range of equations as in Year 2 but with appropriate numbers.

Number lines

$6 \times 3$



Arrays and repeated addition

Continue to understand multiplication as repeated addition and continue to use arrays (as in Year 2).

Doubling multiples of 5 up to 50

$35 \times 2 = 70$

Partition

x	30	5
2	60	10

Use known facts and place value to carry out

simple multiplications

Use the same method as above

(partitioning),

e.g.  $32 \times 3 = 96$

x	30	2
3	90	6

**Division ÷**

÷ = signs and missing numbers

Continue using a range of equations as in Year 2 but with appropriate numbers.

Understand division as sharing and grouping

$15 \div 3$  can be modelled as:

Sharing - 15 shared between 3 (see Year 2 diagram)

OR

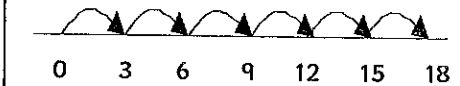


Or

$18 \div 3$  can be modelled as:

Sharing - 18 shared between 3 (see Year 2 diagram)

Grouping - How many 3's make 18?



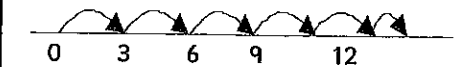
**Remainders**

$16 \div 3 = 5 \text{ r}1$

Sharing - 16 shared between 3, how many left over?

Grouping - How many 3's make 16, how many left over?

e.g.



Division ÷

Nursery


PTP Calculation A) Shows interest in number problems  
**Role play**  
 Practical Activities and Role play  
 Sharing out cakes  
 Counting farm animals  
 Setting the table – plates, cups, places etc.  
 Drinks time

Reception

**Practical play activities using apparatus**  
 Sharing sweets, biscuits, fruit, apparatus in role play and at drinks time.  
  
**Solving problems**  
 Questioning, eg. Playing with marble tower 4 children 12 marbles. How many each?

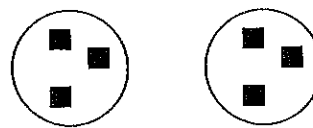
Year 1

**Pictures / marks**  
 12 children get into teams of 4 to play a game. How many teams are there?



Understanding division as sharing.

Sharing – share 6 cubes between these 2 sets



Understanding of inverse operation

$$6 \div 2 = 3$$

$$3 \times 2 = 6$$

Year 2

÷ = signs and missing numbers

$$6 \div 2 = \square \quad \square = 6 \div 2$$

$$6 \div \square = 3 \quad 3 = 6 \div \square$$

$$\square \div 2 = 3 \quad 3 = \square \div 2$$

$$\square \div \nabla = 3 \quad 3 = \square \div \nabla$$

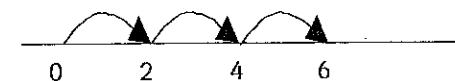
Understand division as sharing and grouping

Sharing – 6 sweets are shared between 2 people. How many do they have each?



$6 \div 2$  can be modelled as:

Grouping – There are 6 sweets. How many people can have 2 each? (How many 2's make 6?)



Use and understand inverse operation

$$6 \div 2 = 3$$

$$3 \times 2 = 6$$

Multiplication x

Nursery

(PTP Calculation C) Uses own methods to work through problems

Practical Activities and Role play

Reception

Practical play activities using apparatus

Count fingers, gloves, socks etc.

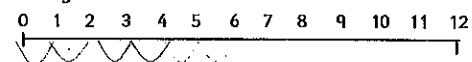
Solving problems

Questioning, eg. You have 10 gloves. How many pairs?

Counting in 2's, 5's and 10's

Using gloves, shoes, hands and fingers.

Using a number line



Groups of boots, socks, fingers



Year 1

Multiplication tables x2 x5 x10

Pictures and symbols

There are 3 sweets in one bag.

How many sweets are there in 5 bags?



$$3 + 3 + 3 + 3 + 3 = 15$$

*(Recording on a number line modelled by the teacher when solving problems)*

Use of bead strings to model groups of.

Year 2

Pictures / marks

12 children get into teams of 4 to play a game. How many teams are there?



Understanding division as sharing.

Sharing – share 6 cubes between these 2 sets


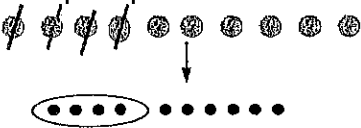
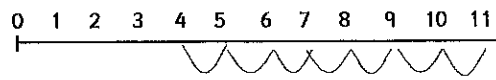
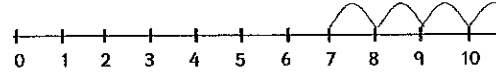
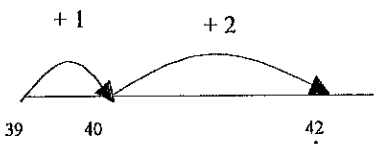

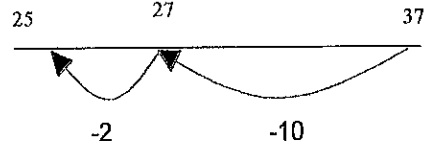
Understanding of inverse operation

$$6 \div 2 = 3$$

$$3 \times 2 = 6$$

# Cottesbrooke Infant School Calculation Policy Guidance 08

## Subtraction -

Nursery	Reception	Year 1	Year 2
<p>involved in addition and subtraction in rhymes and games</p> <p><b>Number rhymes and songs</b></p> <p>5 little ducks 5 little monkeys 5 Little men 12345 fish alive Ring a ring a roses</p> <p><b>(PTP Calculation C) Uses own methods to work through problems</b></p> <p>Practical Activities and Role play</p>	<p><b>Number rhymes</b></p> <p>5 Little ducks 5 Teddies in a bed 5 Monkeys in a tree 10 Green bottles</p> <p><b>Role play activities</b></p> <p>Act out number songs Taking bean bags from hoop</p> <p><b>Subtraction games</b></p> <p>Build a tower throw dice and remove that number</p> <p><b>Subtraction practically with apparatus</b></p> <p>Unifix Beads Eat gingerbread people</p> <p><b>Picture addition with notation then without</b></p> <div style="text-align: center;">  <p>4 - 3 =</p> </div>	<p><b>Number bonds to 10</b></p> <p><b>Pictures / marks</b></p> <p>Sam spent 4p. What was his change from 10p?</p>  <p><b>Number lines (numbered)</b></p> <p>11 - 7 (Counting back)</p>  <p>The difference between 7 and 11 (Counting up)</p>  <p>Recording by - drawing jumps on prepared lines - constructing own lines</p> <p>(Teachers model jottings appropriate for larger numbers)</p> <p><b>Number Squares in 10's</b></p> <p>Subtracting tens - going up number a square Subtracting 1 - is number before</p> <p><b>- = signs and missing numbers</b></p> <p>7 - 3 = □                      □ = 7 - 3 7 - □ = 4                      4 = □ - 3 □ - 3 = 4                      4 = 7 - □ □ - ▽ = 4                      4 = □ - ▽</p> <p><b>Understanding of inverse operation</b></p> <p>7 - 3 = 4 4 + 3 = 7</p> <p><b>Practical</b></p> <p>Role paly, using fingers, unifix, counters etc.</p>	<p><b>Number bonds to 20</b></p> <p>Any shape used for missing symbol or sign, e.g. □</p> <p><b>- = signs and missing numbers</b></p> <p>Continue using a range of equations as in Year 1 but with appropriate numbers. Extend to 14 + 5 = 20 - □</p> <p><b>Find a small difference by counting up</b></p> <p>42 - 39 = 3</p>  <p>Subtract 9 or 11. Begin to add/subtract 19 or 21</p> <p>35 - 9 = 26</p>  <p><b>Use known number facts and place value to subtract (partition second number only)</b></p> <p>37 - 12 = 37 - 10 - 2 = 27 - 2 = 25</p>  <p><b>Use and understand inverse operation</b></p> <p>5 - 2 = 3 3 + 2 = 5</p>