Hanley St Luke's Calculation Policy

Operation: Addition — Level: P scale 4,5,6,7,8

Targets Covered: (N-PS4.1) **Show an awareness of number activities and counting.** (N-PS5.1) **Respond to and join in with familiar number rhymes, stories, songs and games.** (N-PS5.2) **Indicate 1 or 2** (N-PS5.3) **Show that I am aware of contrasting quantities** '
(N-PS6.2) **Begin counting up to 5, count up to 3 independently.** (N-PS6.3) **I can understand the concept of 'more'.**
(N-PS6.4) **Join in with new number rhymes, songs, stories and games.** (N-PS7.1) **Begin counting up to 10, count up to 5 independently.**
(N-PS7.3) **Begin to understand and apply the vocabulary of more and less and add 1.** (N-PS8.1) **Join and begin rote counting independently from given numbers, including beyond 10.** (N-PS8.2) **Recognise differences in amounts (quantity).**

Methods

Children working within these levels will participate in a range of visual, kinesthetic and auditory practical activities including the use of objects, diagrams and ICT.

Vocabulary

FS vocabulary for 'calculating' … count, how many? add, more, and, make, sum, total, altogether, score, double, one more, two more, ten more..., how many more to make... ?, how many more is... than...? take (away), leave, how many are left/left over? ,how many have gone? one less, two less... ten less... how many fewer is... than...? difference between, is the same as, add, more, make, sum, and, sum, total, altogether, score, double, one more, two more, ten more, Number, one, two, three, four, five, six, seven, eight, nine, ten...

Example Questions

I am going to add one more cube to this set of these four cubes. How many cubes will there be then? ☐ ☐ ☐ ☐

Show me five fingers. Use both hands.

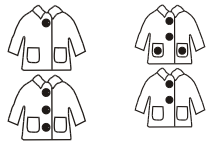
Show me another way to do it.

(Count 5 pennies into a purse and shut it.
Show 2 more pennies in your hand.) How many pennies are there altogether?

Hop three spaces on this number track. Now hop two more. Where are you now?

Count 5 small toys into this cloth bag. How many objects in the bag? Now count 2 more small toys into the bag. How many small toys in the bag now?

What number is one more than five? You can use the cubes to help you



Find two jackets that have four buttons altogether. Are there any other possibilities?

There are four cups on the table.
Put two more cups on the table.
How many cups altogether are on the table now?

I have two toys in a box.
I add four more toys to the box.
How many toys are there in the box now?

Hanley St Luke's Calculation Policy

Operation: Addition — Level:1

Targets Covered: (NMC1.1) **In your head, add numbers to 10. Begin to know some addition facts such as number bonds to 10. Am I beginning to add numbers to ten? Am I beginning to double any number 1-5? Can I add numbers to ten? Can I double any number 1-5? Am I beginning to recall some addition facts to 10 (e.g. 5+5)? (including money)** (N-RWC1.1) **Record your work in different ways. Begin to write some number sentences using +, - and =. Can I add a one digit number to a two digit number (18+7 =)? (including money)**

Vocabulary

problem, solution, calculate, calculation, number sentence, answer, method, explain, money, coin, pence, penny, pound, pay, change, buy, sell, price, spend
+, add, more, plus make, sum, total, altogether , score, double, near double, one more, two more... ten more, how many more to make...? How many more is... than...? How much more is...?=, equals, sign, is the same as, number line, missing number.

Example Questions

Buy 2 different comics and spend 16p. Tick the 2 comics.
Write an addition to show what you did. KS1 1999 level 1 (oral)

There are three people on the bus. One more gets on. How many people are on the bus now?
Use these cubes.
Show me how to work out the answer.

What is fifty-three add ten?
What is thirty-seven add five?

Kay has these coins.

How much money has she altogether?
KS1 1996 level 2c

Write the total.
7 + 3 + 8 + 2 =
KS1 2004 level 2

Write numbers in the shapes to add to 12. □ + △ = 12

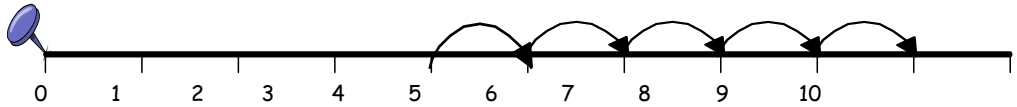
Methods- Level 1 Addition

Using visual representations and practical equipment such as number tracks and counters / cubes to solve simple calculations in addition. Record using own pictorial representations and simple number sentences. Understand and use the signs add, and equals. 3+2=5

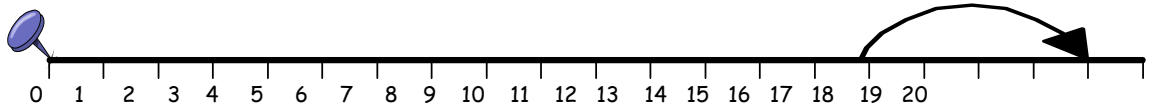
1	2	3	4	5	6	7	8	9	10

Use the hundred square to support mental calculations and a range of number lines to support recording of written calculations
one digit number + one digit number 4 + 5 = 9
one digit number + two digit number or two-digit number + one-digit number 15 + 4 = 19
multiple of 10 + one digit number 20 + 5 = 25
multiple of 10 + two-digit number 20 + 15 = 35

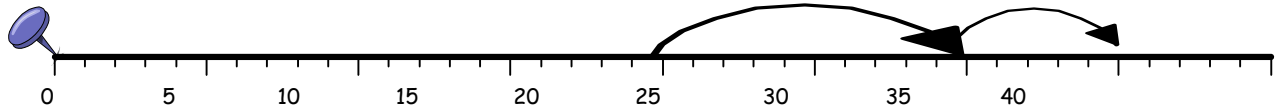
Fully marked and fully numbered number line – counting on in ones (4 + 5 = 9)



Fully marked and fully numbered number line – counting on in steps of more than one (15 + 4 = 19)



Fully marked and partially numbered number line – counting on in steps of more than one (20 + 15 = 35)



Blank number lines, constructing own number lines- teacher model number lines with missing numbers.

+ = signs and missing numbers

3 + 4 = □ □ = 3 + 4
3 + □ = 7 7 = □ + 4
□ + 4 = 7 7 = 3 + □
□ + ∇ = 7 7 = □ + ∇

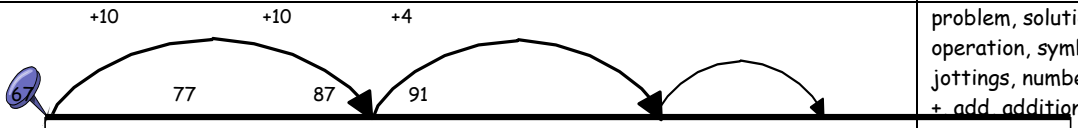
Promoting covering up of operations and numbers and reversal of calculation layout.

Hanley St Luke's Calculation Policy

Operation: Addition — Level: 2

Targets Covered: (NMC2.1) **Use halving as a way of 'undoing' doubling and vice versa. Mentally double and halve numbers from 1-10.** (NMC2.2)**Know number bonds to 10. Use these facts to add or subtract multiples of 10.** (NMC2.3) **Mentally and on paper, solve simple number problems, including those involving money and measures. Do I know the doubles of numbers 1 – 10? Can I recall addition facts of numbers to 10? Can I mentally add a one-digit number/multiple of 10 to any two digit number e.g. 18 + 7 =, 24 + 20 (including money) Can I add mentally a one digit/multiple of 10 to/from any two digit number? e.g. 18+7=, 24+20=, 38-7=, 57-20= (including money) Can I recall addition facts to 20? Can I add multiples of 10? Can I recall addition facts of numbers to 50? Do I know significant doubles? e.g. 10+10, 50+50?** (N-RWC2.1) **Put the sums you do in your head down on paper as a number sentence. Can I add/subtract 2 two digit numbers (e.g. 34+16=, 45-21=) using practical/informal methods? (e.g. partitioning)Can I add and subtract 2 two-digit numbers using a column method, including carrying down and borrowing?**

Methods



67 + 24 = 91

Using empty number line to record calculation strategies in addition and begin to record mental calculations using partitioning and recombining skills working with 2-digit numbers and extend to crossing the tens barrier. ? + 43 = 87

Calculate the value of the unknown using a 100 square. Count on in tens from 43 to 83 then count on in ones from 83 to 87.

Derive and recall all addition and subtraction facts for each number to at least 10

1 (0+1, 1+0, 10-9, 9-8, 8-7, 6-5, 5-4, 4-3,3-2, 2-1, 1-0)

2 (0+2, 1+1, 2+0, 10-8, 9-7, 8-6, 7-5, 6-4, 5-3, 4-2, 3-1, 2-0)

3 (0+3, 1+2, 2+1, 3+0, 10-7, 9-6, 8-5, 7-4, 6-3, 5-2, 4-1, 3-0) and all numbers to at least 10

all pairs with totals to 20

0+20, 1+19, 2+18, 3+17, 4+16, 5+15, 6+14, 7+13, 8+12, 9+11, 10+10, 11+9, 12+8 … 20+0

all pairs with totals to 50

0+50, 10+40, 25+25 etc / **all pairs of multiples of 10 with totals up to 100**

0+100, 10+90, 20+80, 30+70, 40+60, 50+50, 60+40, 70+30, 80+20, 90+10, 100+0

Partition into tens and ones and recombine/ refine to partitioning the second number only:

23 + 12 = 23 + 10 + 2 =33+ 5=35 12 + 23 = 10 + 2 + 20 + 3 = 12+ 20+3

Promoting covering up of operations and numbers and reversal of calculation layout : 45+____= 66.

Vocabulary

problem, solution, calculate, calculation, inverse, answer, method, explain, predict, estimate, reason, operation, symbol, number sentence, equation, mental calculation, written calculation, informal method, jottings, number line, pound (£), penny/pence (p), note, coin, units of measurement and their abbreviations + add, addition, more, plus, make, sum, total, altogether, score, double, near double, one more, two more... ten more... one hundred more, how many more to make ...?, how many more is... than ...?, how much more is...?=, equals, sign, is the same as ten boundary, hundreds boundary, inverse

Key Questions

How much money is in the hand?

KS1 2000 level 2b

Janet spent 23p. Put a circle around the 2 items she bought.

crisps 16p | orange 18p | cake 9p | biscuit 7p

She used 3 coins to pay the 23p. Put a circle around each coin she used.

KS1 1997 level 2b

Write four different numbers to make these correct.

□ + △ = 17

◇ + ○ = 17

KS1 2003 level 2c

Work out the sum of 13 and 7.

KS1 2002 level 2c [oral]

Add these three numbers: five and five and five.

KS1 2003 level 2c [oral]

Tim is thinking of a number. It is 10 more than 20. What number is Tim thinking of?

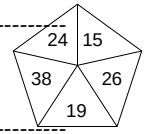
KS1 1999 level 2c [oral)

Write a number in the box to make this correct.

2 + 8 = 6 + □

KS1 1999 level 2b

Tick (✓) the two numbers which total 50.



KS1 2002 level 2a

Write the answer. 150 + 56 = KS1 2005 level 3

Hanley St Luke's Calculation Policy

Operation: Addition — Level: 3

Targets Covered: (N-RWC3.1) **Begin to use decimal notations with money and measures. Order decimals with one or two places.** (N-RWC3.2)**Add 2 digit numbers mentally and 3 digit numbers using written methods.** (NMC3.2)**Recall addition facts to 20. Use these to solve problems involving larger numbers.**

Vocabulary

calculate, calculation, equation, operation, symbol, inverse, answer, method, explain, predict, reason, reasoning, pattern, relationship, decimal, decimal point, decimal place, pound (£), penny/pence (p), units of measurement and abbreviations, degrees Celsius
add, addition, more, plus, increase, sum, total, altogether, score, double, near double, how many more to make...? is the same as, equals, sign , tens boundary, hundreds boundary, inverse

Example Questions

How much must I add to four pounds ninety to make six pounds?
KS2 2003 Mental test level 3

In a bag there are eighty-one red counters and thirty-seven yellow counters. How many counters are there altogether?
Y5 optional test 1998 Mental test level 3

Sandwiches		Drinks		Fruit	
ham	£1.45	milk	55p	apple	15p
tuna	£1.70	cola	45p	pear	20p
salad	£1.20	juice	65p	melon	25p

-------These are the prices of sandwiches, drinks and fruit.

Shereen buys a tuna sandwich, milk and a pear. How much does she pay? Mike has 80p to spend on a fruit and a drink. What two things can he buy for exactly 80p?
KS2 2004 Paper A level 3

Emma is 21 years old today. Her father is 24 years older. How old is Emma's father?
KS1 2005 level 3 [oral]

Add together thirty-eight, twenty-three and forty-four.
KS2 1999 Mental test level 3

Write what the two missing digits could be
□62 + □95 = 757
KS2 1997 Paper A level 4

Add together fifty-three, fifty-five and fifty-seven.
KS2 2002 Mental test level 3

Calculate 584 + 79.
Y5 optional test 2003 Paper A level 3

Circle three numbers which add to make 190.
10 30 50 70 90
KS2 2001 Paper B level 3

Methods- Level 3 Addition

In columns, HTU + TU, then HTU+ HTU, adding **unit** digits first.	HTU + TU

Where calculations are set out in columns use place value correctly (units under units, tens under tens…)

```
  3 5 8
 + 7 3
 -----
    11
  1 2 0
  3 0 0
  4 3 1
```

Add several whole numbers with different numbers of digits.

```
    8 3
  2 5 6
      4
+   5 7
 -------
    2 0
  1 8 0
  2 0 0
  4 0 0
```

DECIMALS: Add two or more three-digit sums of money adjusting the pence / pounds.

```
  £ 4 . 2 1
+ £ 3 . 8 7
 ----------
  £ 0 . 0 8
  £ 1 . 0 0
  £ 7 . 0 0
 ----------
  £ 8 . 0 8
```

then HTU + HTU

Using a standard written method exchanging or borrowing units, and tens, and hundreds. The 'borrowed' unit is signified underneath the second line.

```
  3 6 7
+   8 5
 -------
  4 5 2
  1 1
```

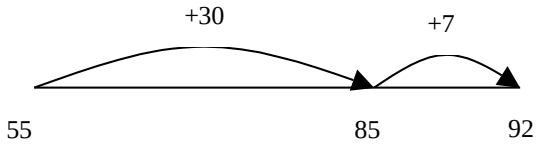
Mentally Partition into tens and units and recombine:

Either partition both numbers and recombine or partition the second number only e.g.

55 + 37 = 55 + 30 + 7

= 85 + 7

= 92



Add the nearest multiple of 10, then adjust

Continue as in level 2 but with appropriate numbers e.g. 63 + 29 is the same as 63 + 30 - 1

+ = signs and missing numbers

Continue using a range of equations as in level 1 and 2 but with appropriate numbers ensuring that children are used to seeing the calculations reversed (showing the answer first). E.g. 73= 70+? 97 = □ + ∇

Hanley St Luke's Calculation Policy

Operation: Addition — Level: 4

Targets Covered: (NMC4.1) **In mental maths, be able to work with all 4 operations. Can I use addition facts for pairs of multiples of 10 up to 1000 (e.g.300 + 700 = 1000)?** (N-RWC4.1) **On paper be able to add whole numbers and decimals.** (N-RWC4.2) **Use the inverse to check calculations. Can I add 4/5 digit numbers, including decimals?**

Methods

HTU + TU then HTU + HTU etc then ThHTU + ThHTU using a standard written method exchanging units, and tens, and hundreds. When crossing the boundaries, carrying to be placed underneath the calculation.

```
  3 6 7
+   8 5
  4 5 2
  1 1
```

Add several numbers with different numbers of digits. Place in correct place value column.

```
  2 1 8 7
    6 7 1
    4 6 8
      5 8
+       9
  3 3 9 3
  1 2 3
```

DECIMALS: Add two or more decimal fractions with up to 3 digits and the same number of decimal places.

```
   7 2. 5 Km
+  5 4. 6 Km
  1 2 7. 1 Km
      1
```

```
    2 . 3 5 Sec
+   9 . 6 1 Sec
   1 1 . 9 6 Sec
```

Extend to different numbers of decimal places in the correct place value columns.

Vocabulary

calculate, calculation, equation, operation, symbol, inverse, answer, method, strategy, explain, predict, reason, reasoning, pattern, relationship, decimal, decimal point, decimal place, estimate, approximate, pound (£), penny/pence (p), units of measurement and abbreviations, degrees Celsius, add, addition, more, plus, increase, sum, total, altogether , score, double, near double, how many more to make...? equals, sign, is the same as, tens boundary, hundreds boundary , units boundary, tenths boundary , inverse.

Key Questions

What number is one hundred and ninety-nine more than four hundred and twenty-eight.
Y5 optional test 2003 Mental test level 4

The table shows the cost of coach tickets to different cities.

		Hull	York	Leeds
Adult	single	£12.50	£15.60	£10.25
	return	£23.75	£28.50	£19.30
Child	single	£8.50	£10.80	£8.25
	return	£14.90	£17.90	£14.75

What is the total cost for a return journey to York for one adult and two children?
How much more does it cost for two adults to make a single journey to Hull than to Leeds? KS2 2002 Paper B level 4

Write a number in the box to make this correct.

6.45 = 6 + 0.4 + ☐

Add three point five to four point eight.
KS2 1999 Mental test level 4

These tins show the amounts collected for a charity.

£3.45 £8.74 £7.96 £10.05 £9.38

What was the total amount collected?
Y5 optional test 1998 Paper B level 3

Add three point five to four point eight.
KS2 2000 Mental test level 4

Write in the missing digits.

```
  2 □ 8
+ 2 9 □
  5 5 5
```

KS2 1995 Paper B level 4

Write the same number in each box to make this correct.

☐ + ☐ + ☐ = 10.5

Y5 optional test 2003 Paper A level 4

Hanley St Luke's Calculation Policy

Operation: Addition — Level: 5

Targets Covered: (N-RWC5.1) **Be able to use all four operations when working with whole numbers and decimals to 2 places.** (N-RWC5.3) **Understand and use an appropriate non-calculator method for solving problems that involve multiplying and dividing any three-digit number by any two-digit number. Am I beginning to use the inverse to check my calculations? Can I use the inverse to check my calculations?** (NMC5.1)**Be able to mentally use all four operations when working with whole numbers and decimals to two places. Can I add and subtract negative numbers in context?**

Vocabulary

calculate, calculation, equation, operation, symbol, inverse, answer, method, strategy, explain, predict, reason, reasoning, pattern, relationship, decimal, decimal point, decimal place, estimate, approximate, pound (£), penny/pence (p), units of measurement and abbreviations, degrees Celsius

add, addition, more, plus, increase, sum, total, altogether score, double, near double, how many more to make...? equals, sign, is the same as, tens boundary, hundreds boundary , units boundary, tenths boundary , inverse

Example Questions

Write the largest whole number to make this statement true.

$50 + \square < 73$

KS2 2004 Paper B level 5

k, m and n each stand for a whole number. They add together to make 1500.

$k + m + n = 1500$

m is three times as big as n.

k is twice as big as n.

Calculate the numbers k, m and n.

KS2 2003 Paper B level 5

Write in what the missing numbers could be.

$170 + \square = 220 - \square$

KS2 2002 Paper B level 5

A yoghurt costs forty-five pence. How many yoghurts can be bought for five pounds?

Circle the two numbers which add up to 1.

0.1 0.65 0.99 0.45 0.35

KS2 1999 Paper A level 5

Methods for Addition Level 5

ThHTU + ThHTU etc using standard written method with exchanging. When crossing the boundaries, carrying to be placed underneath the calculation.

```
  7 6 4 8
+ 1 4 8 6
  9 1 3 4
    1 1 1
```

Add several numbers with different numbers of digits. Place in correct place value column.

```
      6 4 3 2
      4 6 8 1
        7 8 6
          4 2
    +     3
    1 1 9 4 4
      1 2 1
```

Add several numbers with different numbers of digits.

```
      6 4 3 2
      4 6 8 1
        7 8 6
          4 2
    +     3
    1 1 9 4 4
      1 2 1
```

Use refined efficient methods for column addition to add and subtract integers and decimals of any size including a mixture of large and small numbers with differing numbers of decimal places.

e.g. (Y7) 45.89 + 653.7
(Y8) 44.8 + 172.9 + 87.36
(Y9) 6543 + 590.005 + 0.0045

DECIMALS: Add two decimal fractions with up to 4 digits and one or two decimal places.

```
  1 2 4 . 9   Km
+     7 . 2 5 Km
  1 3 2 . 1 5 Km
    1 1
```

DECIMALS: Add more than two decimal fractions with up to 4 digits and one or two decimal places. Place in correct place value column.

```
  4 0 1 . 2
    2 6 . 8 5
+     0 . 7 1
  4 2 8 . 7 6
      1
```

+ = signs and missing numbers

Continue using a range of equations as in level 1, 2, 3 and 4 but with appropriate numbers.

3 5+ 49 = □ □ = 398 + 4.5
123 + □ = 667 557 = □ + 554
□ + 64 = 975 777 = 333 + □
□ + ∇ = 0.7 123 7 = □ + ∇

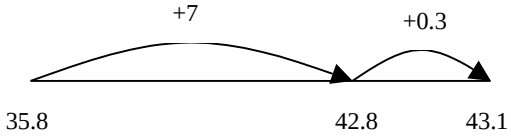
Promoting covering up of operations and numbers and reversal of equation. Introduction of brackets and BODMAS methods.

6+(5x5)=

Mentally partition into hundreds, tens, ones and decimal fractions and recombine

Either partition both numbers and recombine or partition the second number only e.g.

35.8 + 7.3 = 35.8 + 7 + 0.3
= 42.8 + 0.3
= 43.1



Add the nearest multiple of 10, 100 or 1000, then adjust

Continue as in other levels but with appropriate numbers including extending to adding 0.9, 1.9, 2.9 etc

Hanley St Luke's Calculation Policy

Operation: Addition Level:6

Targets Covered: (NMC6.1) **Estimate using known facts.** (NMC6.2) **Understand and use common denominators to add fractions mentally. Can I mentally add numbers which do not have the same number of decimal places?** (N-RWC4.2) **Use the inverse to check calculations.**

Analysis of the grading of the difficulty of the calculation, independent of method used. **Simpler calculations should be done mentally.**

No exchanging		Extra digit in answer		Exchange units to tens		Exchange tens to hundreds		Exchange units to tens and tens to hundreds		More than two numbers to be added	
23 +42	315 +624	94 +73	561 +718	47 +25	237 +516	371 +485	293 +541	376 +485	295 +547	35 62 +24	237 148 +516

Methods

Use both mental and written methods efficiently to add a range of numbers including negative numbers, decimals with different numbers of decimal places and fractions.

Vocabulary

calculate, calculation, equation, operation, symbol, answer, method, strategy, explain, predict, reason, reasoning, pattern, relationship, decimal, decimal point, decimal place, estimate, approximate, pound (£), penny/pence (p), units of measurement and abbreviations, degrees Celsius, add, addition, more, plus, increase , sum, total, altogether , score , double, near double, how many more to make...?, is the same as, equals, sign, tens boundary, hundreds boundary , units boundary, tenths boundary, inverse, fraction, decimal fraction, negative, positive, algebra, formula, rule.

Example Questions

Write three decimals, each greater than zero, which add together to make a total of 0.01

□ + □ + □ = 0.01

KS2 1999 Paper C level 6

Check these subtractions by doing an inverse operation on them. Which are wrong?

a) 56 – 27 = 39 b) 53 – 29 = 34 c) 67 – 35 = 32 d) 123 – 45 = 72 e) 156 – 88 = 68 f) 374 – 94 = 280g) 318 – 163 = 255 h) 251 – 135 = 216 i) 462 – 187 = 275 j) 512 – 351 = 161 k) 251 – 219 = 132 l) 542 – 315 = 223

Join all the pairs of numbers that **add** together to equal **1**

0.1	0.99
0.11	0.9
0.01	0.999
0.91	0.89
0.001	0.09

1/2 + 1/4 = 9/10 + 1/2=

2a + 5 + ... = 2a + 6

6d + 7 + ... = 6d + 10