## Mental calculation skills:

Working mentally, with jottings if needed, children should be able to:

- add or subtract a pair of single-digit numbers,
e.g. $4+5,8-3$
- add or subtract a single-digit number to or from a teens number,
e.g. $13+5,17-3$
- add or subtract a single-digit to or from 20, and add a multiple of 10 to a single-digit number.
- addition doubles for all numbers to 20 , e.g. $8+8$

- know what to add to a single-digit number to make 16 e.g. $9+$ 回 $=16$

- doubles of all numbers to 10 ,
e.g. double 6

- odd and even numbers to 20

e.g. $10+7,7+30$
- add near doubles,
e.g. $6+7$


If you know $6+6=$


- count on from and back to zero in ones, twos, fives or tens
count the sants 5 r 2 .
 Facts ITP


## Mental methods or strategies:

Children should understand when to and be able to apply these strategies:

- reorder numbers when adding
e.g. put the larger number first
- count on or back in ones, twos or tens
- partition small numbers,
e.g. $8+3=8+2+1$
- partition and combine tens and ones

- partition: double and adjust, e.g. $5+6=5+5+1$
- use patterns of last digits,
e.g. 0 and 5 when counting in fives


Number grid ITP

## Recall:

Children should be able to derive and recall:

- addition and subtraction facts for all numbers up to
at least 20 , e.g. $13+4,18-5$
- number pairs with totals to 20

- all pairs of multiples of 10 with totals up to 100 ,
e.g. $30+70$, or $60+$ ? $=100$
- derive and use related facts up to 100
- what must be added to any two-digit number to make the next multiple of 10 ,
e.g. $52+$ = 60
- addition doubles for all numbers to 20 , e.g. $17+17$
and multiples of 10 to 50 ,
e.g. $40+40$
- add and subtract mentally a 2 digit and a 1 digit,

2 digit and 10's, 2 digit and 2 digit

## 

- doubles of all numbers to 20, e.g. double 13, and corresponding halves
- doubles of multiples of 10 to 50, e.g. double 40, and corresponding halves

1 Odd and Even

- multiplication facts for the 2,5 and 10 times-tables, and corresponding division facts
- odd and even numbers to 100 | 11 | 11 | 12 | 12 |
| ---: | ---: | ---: | ---: |
| 2 | 2 | 2 | 2 |
* Numbers Chart
 $\begin{array}{llllllllll}11 & 12 & 13 & 14 & 15 & 16 & 17 & 18 & 19 & 20\end{array}$

 \begin{tabular}{lllllllllll}
21 \& 22 \& 23 \& 24 \& 25 \& 26 \& 27 \& 28 \& 29 \& 30 <br>
31 \& 32 \& 33 \& 34 \& 35 \& 36 \& 37 \& 38 \& 39 \& 40 <br>
\hline

 

\& 31 <br>
41 \& 42 \& 43 \& 44 \& 45 \& 46 \& 47 \& 48 \& 49 \& 50 <br>
\hline

 $\begin{array}{llllllllll}51 & 52 & 53 & 54 & 55 & 56 & 57 & 58 & 59 & 60\end{array}$ $\begin{array}{lllllllll}61 & 62 & 63 & 64 & 65 & 66 & 67 & 68 & 69 \\ 70\end{array}$ $\begin{array}{llllllllll}71 & 72 & 73 & 74 & 75 & 76 & 7 & 78 & 79 & 80\end{array}$ 

71 \& 12 \& 13 <br>
81 \& 82 \& 83 \& 84 \& 85 \& 85 \& 86 \& 87 \& 88 \& 89 \& 90 <br>
\hline

 

\hline 91 \& 92 \& 93 \& 94 \& 95 \& 96 \& 97 \& 98 \& 99 \& <br>
\hline
\end{tabular}

## Mental calculation skills:

Working mentally, with jottings if needed, children should be able to:

- add or subtract a pair of single-digit numbers, including crossing 10,

Counting
e.g. $5+8,12-7$

ITP

- add any single-digit number to or from a multiple of 10,
e.g. $60+5$
- subtract any single-digit number from a multiple of 10,
e.g. 80-7
- add or subtract a single-digit number to or from a twodigit number, including crossing the tens boundary,
e.g. $23+5,57-3$, then $28+5,52-7$
- add or subtract a multiple of 10 to or from any two-digit
number, e.g. $27+60,72-50$
- add $9,19,29$, .. or $11,21,31, \ldots$
- add near doubles, e.g. 13+14, 39+40
$59+20$

- double any multiple of 5 up to 50, e.g. double 35
- halve any multiple of 10 up to 100, e.g. halve 90
- find half of even numbers to 40
- find the total number of objects when they are organised into groups of 2,5 or 10


Mental methods or strategies:
Children should understand when to and be able to apply these strategies:

- reorder numbers when adding
- partition: bridge through 10 and multiples of 10 when adding and subtracting
- partition and combine multiples of tens and ones
- use knowledge of pairs making 10
- partition: count on in tens and ones to find the total
- partition: count on or back in tens and ones to find the difference
- partition: add a multiple of 10 and adjust by 1 - partition: double and adjust

$41 p$ could be made from $10 p+10 p+10 p+10 p+1 p$ $10 \mathrm{D}) 10 \mathrm{D}$ (D) or $20 \mathrm{p}+20 \mathrm{p}+\mathrm{lp}$ 20D (20P
- partition: double the tens and ones separately, then recombine
- use knowledge that halving is the inverse of doubling and that doubling is equivalent to multiplying by two
- use knowledge of multiplication facts from the 2,5 and 10 times-tables,
e.g. recognise that there are 15 objects
altogether because there are three groups of five



Recall:
Children should be able to derive and recall:

- sums and differences of pairs of multiples of 10,100 or

1000

- addition doubles of numbers 1 to 100 ,
e.g. $38+38$, and the corresponding halves
- what must be added to any three-digit number to make
the next multiple of 100 ,
e.g. $521+$ 回 $=600$
- pairs of fractions that total 1

- multiplication facts to $12 \times 12$ and the corresponding
division facts
- count in multiples of 6, 7, 9, 25 and 1000
- doubles of numbers 1 to 100 , e.g: double 58, and corresponding halves
- doubles of multiples of 10 and

and corresponding halves
- fraction and decimal equivalents of one-half, quarters, tenths and hundredths,
$\times \quad$ e.g. 310 is 0.3 and 3100 is 0.03
- factor pairs for known multiplication facts


## Mental calculation skills:

Working mentally, with jottings if needed, children should be able to:

- add or subtract any pair of two-digit numbers, including crossing
the tens and 100 boundary,
$\mathbf{2 3}+\mathbf{1 0}=33$
e.g. $47+58,91-35$
- add or subtract a near multiple of 10 ,
e.g. $56+29,86-38$
- add near doubles of two-digit numbers,

| \% ${ }^{10}$ |  |
| :---: | :---: |
| , | mmm |
|  |  |
|  |  |
|  |  |
| \% |  |

e.g. $38+37$

- add or subtract two-digit or three-digit multiples of 10,
e.g. $120-40,140+150,370-180$
B

[^0]
## Mental methods or strategies:

Children should understand when to and be able to apply these strategies:

- count on or back in hundreds, tens and ones
- partition: add tens and ones separately, then recombine
- partition: subtract tens and then ones, e.g. subtracting 27 by subtracting 20 then 7
- subtract by counting up from the smaller

to the larger number
- partition: add or subtract a multiple of 10 and adjust,
e.g. $56+29=56+30-1$, or
$86-38=86-40+2$
- partition: double and adjust

- use knowledge of place value and related calculations,
e.g. work out $140+150=290$ using $14+15=29$
- partition: count on or back in minutes and hours, bridging through 60 (analogue and digital times)

- partition: double or halve the tens and ones separately, then recombine - use understanding that when a number is multiplied or divided by 10 or 100 , its digits move one or two places to the left or the right and zero is used as a place holder
- use knowledge of multiplication facts and place value,
e.g. $7 \times 8=56$ to find $70 \times 8,7 \times 80$
- use partitioning and the distributive law to multiply,

e.g. $13 \times 4=(10+3) \times 4=(10 \times 4)+(3 \times 4)=40$

$$
34 \times 6=
$$

 111111111111111111111111111111111111111


$$
30 \times 6
$$

$+4 \times 6$

$$
=180+24
$$

$$
=204
$$

## Recall:

Children should be able to derive and recall:

- sums and differences of decimals,
e.g. $6.5+2.7,7.8-1.3$

- doubles and halves of decimals,
e.g. half of 5.6 , double 3.4
- what must be added to any fourdigit number to make the next multiple of 1000,
e.g. $4087+$ ? $=5000$
- what must be added to a decimal with units and tenths to make the next whole number,
e.g. $7.2+$ 回 $=8$


## Mental calculation skills:

Working mentally, with jottings if needed, children should be able to:

- add or subtract a pair of two-digit numbers or three-digit multiples of 10, e.g. $38+86,620-380,350+360$
- add or subtract a near multiple of $\mathbf{1 0}$ or $\mathbf{1 0 0}$ to any two-digit or threedigit number mentally, e.g. $235+198$
- find the difference between near multiples of 100 ,
e.g. 607-588, or of 1000, e.g. 6070-4087 (Use jottings to support this calculation: count up the difference on a number line, bridging through key multiples of 100):
- add or subtract any pairs of decimal fractions each with units and tenths, e.g. 5.7 + 2.5, $6.3-4.8$


$$
1209-388=821
$$



## Mental methods or strategies:

Children should understand when to and be able to apply these strategies:

- count on or back in hundreds, tens, ones and tenths (starting
from any integer or decimal)
- partition: add hundreds, tens or ones separately, then recombine

$$
\begin{gathered}
128+214=342 \\
1008208200104 \\
100+200=300 \\
20+10=30 \\
8+4=12 \\
300+30+12=342
\end{gathered}
$$

- subtract by counting up from the smaller to the larger number (where efficient due to numbers close together or near multiples)


Add the 'hops': $40+21+4=65$

- add or subtract a multiple of 10 or 100 and adjust (e.g. $235+$ 198 (add 200 mentally and subtract 2); $964+88$ (add 90, then subtract 2); 621 - 39 (subtract 40 then add 1 back on)
- partition: double and adjust
- use knowledge of place value and related calculations,
e.g. 6.3-4.8, using 63-48
- partition for calculation with time: count on or back in minutes and hours, bridging through 60 (analogue and digital times): Mental jottings as a 'time number line':

$x$ and $\div \quad$ Year 5


## Recall:

Children should be able to derive and recall:

- Recall squares to $\mathbf{1 2 \times 1 2}$

|  | 123 | 4 | 4 |  |  | $\frac{89}{89}$ | $\begin{aligned} & 91010 \\ & 9 \\ & 910 \end{aligned}$ |  | 4 | 88 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |  |
|  | 24.6 | 8 | 810 | 12 |  |  | 1820 | 2022 | 9 |  |
|  | 36. | $\square_{9} 12$ | 1215 | 518 |  | 24.27 | 27.30 | 3033 |  |  |
|  | 812 | $12^{16}$ | 620 | 24 | 28 | 3236 | 3640 | , | 16 |  |
|  | 51015 | 1520 | 2025 | 530 | 35 | 4045 | 4550 | 50.5560 |  |  |
|  | 1218 | 1824 | 2430 | 0 | 42 | 485 | 54 | 6066 |  |  |
|  | 71412 | 21 | 35 | 5 | 495 | 5663 | 70 | 707784 | 25 | \%\% |
|  | 16 | 24.32 | 40 | ${ }^{0} 48$ | 56 | 6472 | 7280 | 80.8896 |  |  |
|  | 9182 | 2736 | 45 | 454 | 43 |  | 8190 | 9099108 |  |  |
|  | 102030 | 3040 | 50 | 060 | 708 | 8090 | 90 |  | 36 |  |
|  | $1{ }^{22} 33$ | 2334 | 45 | 566 |  | 889 |  | 10121132 |  |  |
|  | ${ }^{12} 24.36$ | 43648 |  |  |  |  | $108120$ | 120 ${ }^{132}$ |  | \%\%\%\% |

- Recall division facts corresponding
to tables up to $12 \times 12$, and the related unit fractions, e.g. $\mathbf{7 \times 9}=\mathbf{6 3}$ so one-ninth of 63 is 7 and oneseventh of 63 is 9
- Recall percentage equivalents of one-half, one-quarter, three-quarters, tenths and hundredths

- Recall / find factor pairs to 100
- Recall prime numbers up to 19

Prime Nambers

## Mental calculation skills:

Working mentally, with jottings if needed, children should be able to:

- multiply and divide two-digit numbers by 4 or 8,
e.g. $26 \times 4,96 \div 8$
- multiply two-digit numbers by 5 or $\mathbf{2 0}$,
e.g. $320 \times 5,14 \times 20$ using doubling and halving
- multiply by 25 or 50 , e.g. $48 \times 25,32 \times 50$
- double three-digit multiples of 10 to 500 ,
e.g. $380 \times 2$, and find the corresponding halves, e.g. $760 \div 2$
- find the remainder after dividing a two-digit number by a single-digit number, e.g. $27 \div 4=6 R 3$
- multiply and divide whole numbers and decimals by 10,100 or 1000 ,
e.g. $4.3 \times 10,0.75 \times 100,25 \div 10,673 \div 100,74 \div 100$

- multiply pairs of multiples of 10 ,
e.g. $60 \times 30$, and a multiple of 100 by a single digit number, e.g. $900 \times 8$
- divide a multiple of $\mathbf{1 0}$ by a single-digit number (whole number answers) e.g. $80 \div 4,270 \div 3$
- find fractions of whole numbers or quantities,
e.g. $2 / 3$ of $27,4 / 5$ of 70 kg
- find $\mathbf{5 0 \%}, \mathbf{2 5 \%}$ or $\mathbf{1 0 \%}$ of whole numbers or quantities,
e.g. $25 \%$ of $20 \mathrm{~kg}, 10 \%$ of $£ 80$
- find factor pairs for numbers to 100,
e.g. 30 has the factor pairs $1 \times 30,2 \times 15,3 \times 10$ and $5 \times 6$


## Mental methods or strategies:

Children should understand when to and be able to apply these strategies:

- multiply or divide by 4 or 8 by repeated doubling or halving
- form an equivalent calculation, e.g. to multiply by 5 , multiply by

10 , then halve; to multiply by 20 , double, then multiply by 10

- use knowledge of doubles/halves and understanding of place
value, e.g. when multiplying by 50 multiply by 100 and divide by 2
- use knowledge of division facts, e.g. when to find a remainder
- use understanding that when a number is multiplied or divided by $\mathbf{1 0}$ or 100, its digits move one or two places to the left or the right relative to the decimal point, and zero is used as a place holder
- use knowledge of multiplication and division facts and understanding of place value, e.g. calculating with multiples of 10 - use knowledge of equivalence between fractions and percentages,
e.g. to find $50 \%, 25 \%$ and $10 \%$
- use knowledge of multiplication and division facts to find factor pairs
('Factor rainbows' - rainbow starts and ends with 1 and the number itself, then all the other possible pairs in order inside)




[^0]:    - double any two-digit number, e.g. double 39,
    - double any multiple of 10 or 100 ,
    e.g. double 340 , double 800 , and halve the corresponding multiples of 10 and 100,
    - halve any even number to 200
    - find unit fractions and simple non-unit fractions of numbers and quantities,
    e.g. 3/8 of 24,
    - multiply and divide numbers to 1000 by 10 and then 100 (whole-number answers,
     e.g. $325 \times 10,42 \times 100,120 \div 10,600 \div 100$, $850 \div 10$ ),
    - multiply a multiple of 10 to 100 by a single-digit number, e.g. $40 \times 3$
    - multiply numbers to 20 by a single-digit, e.g. $17 \times 3$,
    - identify the remainder when dividing by 2,5 or 10
    - give the factor pair associated with a multiplication fact
    e.g. identify that if $2 \times 3=6$ then 6 has the factor pair 2 and 3

