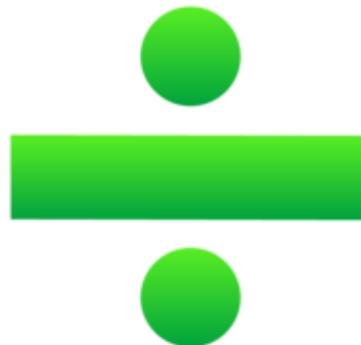


# GREATHAM PRIMARY SCHOOL

## Mental calculation strategies



# YEAR 1

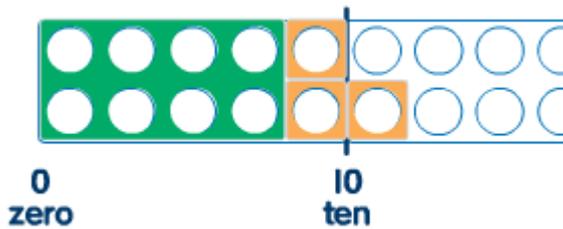
## addition

**Count to and across 100, forwards, beginning with 0 or 1, or any given number**

count in 1s  
count in 2s  
Count in 5s  
count in 10s

**add one-digit and two-digit numbers within 20, including zero**

count in 1s e.g  $8+3 = 9, 10, 11$

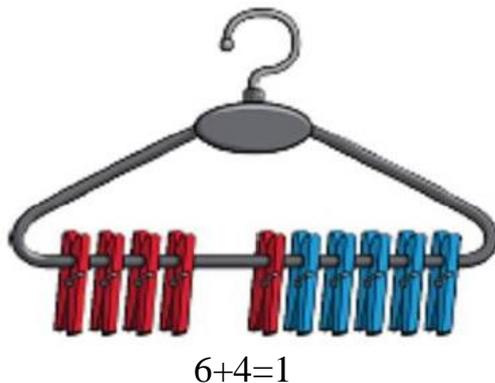


**using number facts**

‘story’ of 4,5,6,7,8 and 9  
e.g.  $6 = 6+0$ .  $5+1$ ,  $4+2$ ,  $3+3$

**number bonds**

$5+5$ ,  $6+4$ ,  $7+3$ ,  $8+2$ ,  $9+1$ ,  $10+0$



## Use known facts to see patterns when adding

e.g.  $5+2=7$  so we know  $25+2$ ,  $65+2$  and  $85+2$

$9+7=16$ ;  $16-7=9$ ;  $16-9=7$

## subtraction

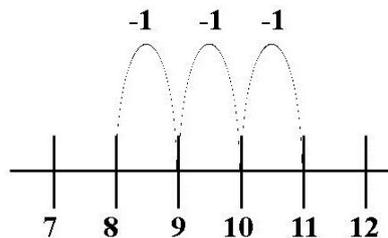
**Count to and across 100 backwards, beginning with 0 or 1, or any given number**

Count in 1s

Count in 10s

**Subtract one-digit and two-digit numbers within 20, including 0**

Count back in 1s



Count back in 10s

**Using number facts**

Story' of 3,4,5,6,7,8 and 9

e.g.  $9=9-0=9$ ,  $9-1=8$ ,  $9-2=7$ ,  $9-3=6$ ,  $9-4=5$ ,  $9-5=4$ ,  $9-6=3$ ,  $9-7=2$ ,  $9-8=1$ ,  $9-9=0$

**Use known facts to see patterns when subtracting**

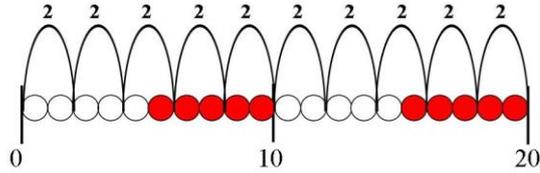
$6-2=4$  so  $26-2=24$ ,  $76-2=74$

$16-9=7$ ;  $16-7=9$ ;

# multiplication

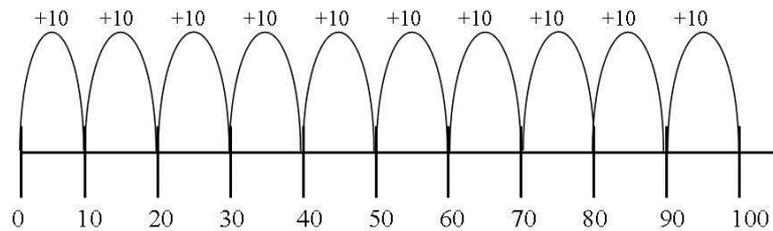
## counting in steps

Counting in 2s



Counting in 5s

Counting in 10s



## Doubling

Find doubles to double 5 – using fingers

e.g. double 3 = 6



## division

## Counting in steps

Count in 2s, 5s and 10s

Find half of even numbers up to 12, including realising that it is hard to halve an odd number



## YEAR 2

### addition

#### **Place value**

Know 1 more or 10 more than any number

e.g. 1 more than 68

10 more than 53

#### **Partitioning**

e.g.  $35 + 54$  as  $30 + 50$  and  $5 + 4$ , then finally combine the two totals:  $80 + 9$

$23 = 20 + 3$  and  $23 = 10 + 13$

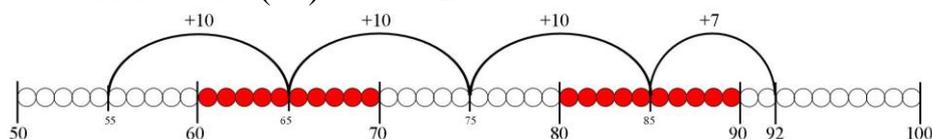
#### **Counting on**

Add 10 and multiples of 10 to a given 1-digit or 2-digit number

e.g.  $48 + 20$  as 48, 58, 68, or in hops:  $48 + 20 = 68$

Add two 2-digit numbers by counting on in 10s, then in 1s

e.g.  $55 + 37$  as  $55 + 30$  (85) + 7 = 92



Add near multiples of 10

e.g.  $57 + 19$  - Start at largest number

e.g.  $69 + 21$  - With 2 digit numbers, partition the second number ( e.g.  $21 = 20 + 1$  )

#### **Using number facts**

know pairs of numbers which make 20

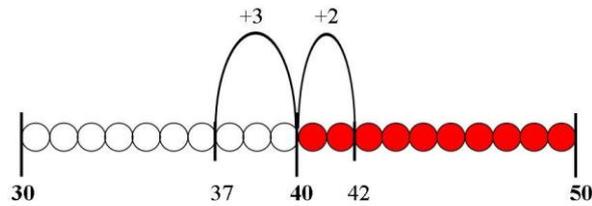
e.g.  $14 + 6$ ,  $17 + 3$

Use patterns based on known facts when adding

e.g.  $4 + 3 = 7$ , so we know  $34 + 3 = 37$ ,  $64 + 3 = 67$ ,  $56 + 3 = 59$

Bridging 10

e.g.  $37 + 5 = 37 + 3$  (40) + 2 = 42



Add 3 or more 1-digit numbers – using number bonds to 10 to help

e.g.  $8+4+2 = 10+4 = 14$

$4+3+4 = 8+3 = 11$

## subtraction

### Using place value

Know 1 less or 10 less than any number

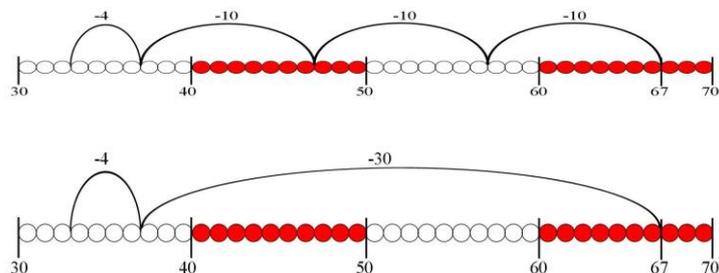
### Taking away

Subtract 10 and multiples of 10

e.g.  $76-20$  as 76, 66, 56 or in one hop:  $76-20 = 56$

Subtract two 2-digit numbers by counting back in 10s, then in 1s

e.g.  $67-34$  as 67 subtract 30 (37) then count back 4 (33)



Subtract near multiples of 10

e.g.  $74-21$

e.g.  $57-19$

## Using number facts

Know pairs of numbers which make the numbers up to and including 20 and derive related subtraction facts

e.g.  $10 - 6 = 4$ ,  $8 - 3 = 5$ ,  $5 - 2 = 3$

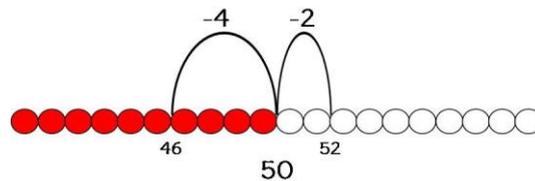
Subtract using patterns of known facts

e.g.  $9 - 3 = 6$ , so we know  $39 - 3 = 36$ ,  $69 - 3 = 66$ ,  $89 - 3 = 86$

$3 + 7 = 10$ ;  $10 - 7 = 3$ ;  $10 - 3 = 7$

Bridging 10

e.g.  $52 - 6$  as  $52 - 2 = 50$  -  $4 = 46$



Know that you can add numbers in any order

You cannot subtract numbers in any order

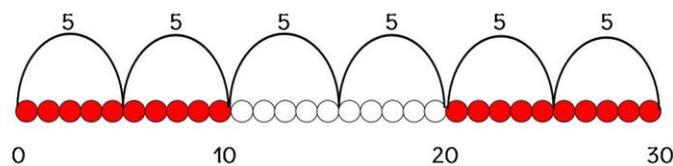
## multiplication

### Counting in steps

Count in 2s

Count in 5s

Count in 10s

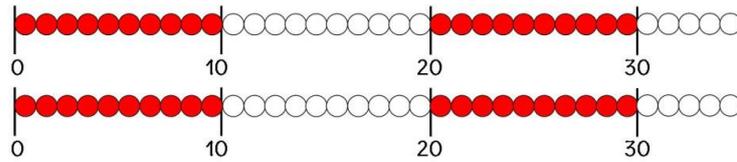


Begin to count in 3s

### Doubling and halving

Begin to know doubles of multiples of 5 to 100

e.g. double 35 is 70



Begin to double 2-digit numbers less than 50 with 1s digits of 1, 2, 3, 4 or 5

### **Grouping**

Understand that  $5 \times 3$  can be worked out as three 5s or five 3s  
e.g.  $3 \times 5$  is the same as  $5 \times 3$

Know that  $2 \times 5$  is the same as  $5 \times 2$

### **Using number facts**

Know doubles to double 20

Start learning  $\times 2$ ,  $\times 5$ ,  $\times 10$  tables, relating these to counting in 2s, 5s, and 10s

e.g.  $5 \times 10 = 50$ , and five steps in the 10s count  
 $= 10, 20, 30, 40, 50$



### **division**

#### **Counting in steps**

Count in 2s, 5s and 10s

Begin to count in 3s

#### **Halving**

Find half of numbers up to 40, including realising that half of an odd number gives a remainder of 1 or an answer containing a  $\frac{1}{2}$

e.g.  $\frac{1}{2}$  of 13— $6\frac{1}{2}$  which is also equal to 6.5

Begin to know half of multiples of 10 to 100

e.g. half of 90 is 45

### **Using number facts**

Know half of even numbers to 24

Know x2, x5 and x10 division facts

Begin to know x3 division facts

## **YEAR 3**

### **addition**

#### **Using place value**

Count in 100s

e.g.  $365 + 300 = 465, 565, 665$

Add multiples of 10, 100 and £1

e.g.  $527 + 40$

e.g.  $723 + 200$

e.g.  $£3.34 + £5$  as  $£3 + £5$  and 34p

#### **Partitioning**

e.g.  $£8.50 + £3.70$  as  $£8 + £3$  and 50p + 70p and combine the totals:  $£11 + £1.20$

e.g.  $347 + 36$  as 300 and 40 + 30 and 7 + 6 and combine the totals:  $370 + 13 = 383$

e.g.  $68 + 74$  as  $60 + 70$  and  $8 + 4$  and combine the totals:  $130 + 12 = 142$

#### **Counting on**

Add two 2-digit numbers by adding the multiple of 10, then the 1s

e.g.  $67 + 55$  as  $67 + 50 (117) + 5 = 122$

Add near multiples of 10 and 100

e.g.  $67 + 39$

e.g.  $364 + 199$

Add pairs of 'friendly' 3-digit numbers

e.g.  $548 + 120$

Count on from 3-digit numbers

e.g.  $247 + 34$  as  $247 + 30 (277) + 4 = 281$

## Using number facts

'Story' of 4, 5, 6, 7, 8 and 9

e.g.  $7 = 7 + 0$ ,  $6 + 1$ ,  $5 + 2$ ,  $4 + 3$

Number bonds to 10

e.g.  $5 + 5$ ,  $6 + 4$ ,  $7 + 3$ ,  $8 + 2$ ,  $9 + 1$ ,  $10 + 0$

Add to the next 10 and the next 100

e.g.  $176 + 4 = 180$

e.g.  $435 + 65 = 500$

## subtraction

### Taking away

Take away multiples of 10, 100 and £1

e.g.  $476 - 40 = 436$

e.g.  $476 - 300 = 176$

e.g.  $£4.76 - £3 = £1.76$

**Partitioning** - only partition the second number

e.g.  $68 - 42$  as  $68$  and  $40 - 2$

e.g.  $£6.84 - £2.40$  as  $£6.84$  and  $£2 - 40p$

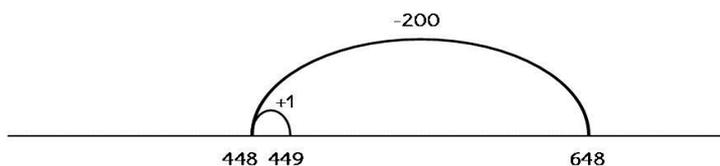
Count back on 100s, 10s then 1s

e.g.  $763 - 121$  as  $763 - 100$  (663) - 20 (643) - 1 = 642

Subtract near multiples of 10 and 100

e.g.  $648 - 199$

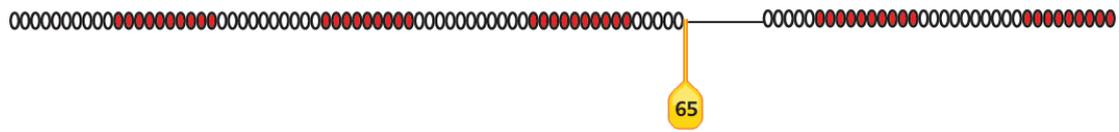
e.g.  $86 - 39$



## Using number facts

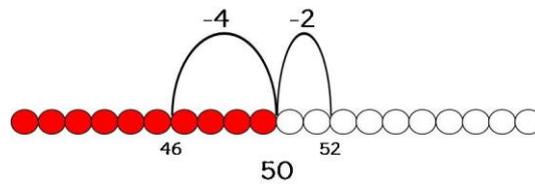
Know pairs which total each number to 20

Know number bonds to 100



### Bridging 10

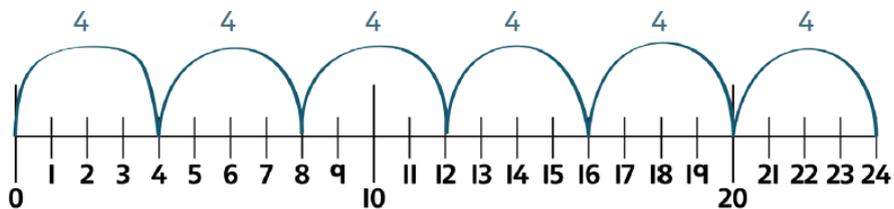
e.g.  $52 - 6$  as  $52 - 2$  (50) - 4 = 46



### multiplication

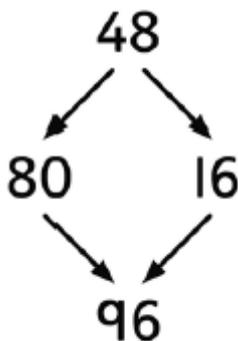
### Counting in steps

Count in 2s, 3s, 4s, 5s, 8s, 10s



### Doubling and halving

Find doubles of numbers to 50 using partitioning



e.g. double 48

Using doubling as a strategy in multiplying by 2  
e.g.  $18 \times 2$  is double  $18 = 36$

### **Grouping**

Recognise that multiplication is commutative  
e.g.  $4 \times 8 = 8 \times 4 = 8 + 8 + 8 + 8$

Multiply multiples of 10 by 1-digit numbers  
e.g.  $30 \times 8 = 240$   
e.g. If  $3 \times 8 = 24$  then  $30 \times 8 = 240$

Multiply 'friendly' 2-digit numbers by 1-digit numbers  
e.g.  $13 \times 4$

### **Using number facts**

Know doubles to double 20  
e.g. double 15 is 30

Know doubles of multiples of 5 to 100  
e.g. double 80 is 160  
e.g. double 5 is 10  
e.g. double 85 is 170

Know  $\times 2$ ,  $\times 3$ ,  $\times 4$ ,  $\times 5$ ,  $\times 8$ ,  $\times 10$  table facts and relate to counting in steps

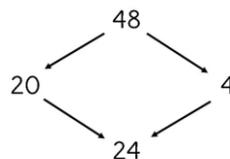
## **division**

### **Counting in steps**

Count in 2s, 3s, 4s, 5s, 8s and 10s

### **Doubling and halving**

Find half of even numbers to 100 using partitioning



e.g. find half of 48

Using halving as a strategy in dividing by 2  
e.g.  $36 \div 2$  is half of  $36 = 18$

Find half of odd numbers

### **Grouping**

Recognise that division is not commutative  
e.g.  $16 \div 8$  does not equal  $8 \div 16$

Relate division to multiplication  
e.g.  $\_ \times 8 = 40$  is the same calculation as  $40 \div 8 = \_$  thus we can count in 8s to find the answer

Divide multiples of 10 by 1-digit numbers  
e.g.  $240 \div 8 = 30$

Begin to use subtraction of multiples of 10 of the divisor to divide numbers above the 10th multiple  
e.g.  $52 \div 4$  is  $10 \times 4$  (40) and  $3 \times 4$  (12) = 13

### **Using number facts**

Know half of even numbers to 40

Know half of multiples of 10 to 200  
e.g. half of 170 is 85

Know  $\times 2$ ,  $\times 3$ ,  $\times 4$ ,  $\times 5$ ,  $\times 8$  and  $\times 10$  division facts and relate to counting in steps

## YEAR 4

### addition

#### Using place value

Counting in 1000s

e.g. Know  $3475 + 2000$  as 3475, 4475, 5475

#### Partitioning

e.g.  $746 + 40$

e.g.  $746 + 203$  as  $700 + 200$  and 40 and  $6 + 3$

e.g.  $134 + 707$  as  $100 + 700$  and 30 and  $4 + 7$

#### Counting on

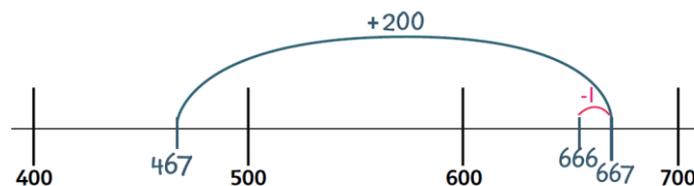
Add 2-digit numbers to 2-digit, 3-digit and 4-digit numbers by adding the multiple of 10 then the 1s

e.g.  $167 + 55$  as  $167 + 50$  (217) + 5 = 222

Add near multiples of 10, 100 and 1000

e.g.  $467 + 199$

e.g.  $3462 + 2999$



Count on to add 3-digit numbers and money

e.g.  $463 + 124$  as  $463 + 100$  (563) + 20 (583) + 4 = 587

e.g.  $£4.67 + £5.30$  as  $£9.67 + 30p$

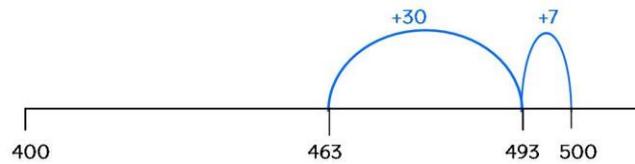
#### Using number facts

Number bonds to 100 and to the next multiple of 100

e.g.  $288 + 12 = 300$

e.g.  $1353 + 47 = 1400$

e.g.  $463 + 37 = 500$



Number bonds to £1 and to the next whole pound

e.g.  $63\text{p} + 37\text{p} = \text{£}1$

e.g.  $\text{£}3.45 + 55\text{p} = \text{£}4$

Add to the next whole number

e.g.  $4.6 + 0.4$

e.g.  $7.2 + 0.8$

## subtraction

### **Taking away**

Use place value to subtract

e.g.  $4748 - 4000$

Take away multiples of 10, 100, 1000, £1, 10p or 0.1

e.g.  $8392 - 50$

e.g.  $6723 - 3000$

e.g.  $\text{£}3.74 - 30\text{p}$

e.g.  $5.6 - 0.2$

### **Partitioning**

e.g.  $\text{£}5.87 - \text{£}3.04$  as  $\text{£}5 - \text{£}3$  and  $7\text{p} - 4\text{p}$

e.g.  $7493 - 2020$  as  $7000 - 2000$  and  $90 - 20$

### **Count back**

e.g.  $6482 - 1301$  as  $6482 - 1000$  (5482) - 300 (5182) - 1 = 5181

Subtract near multiples of 10, 100, 1000 or £1

e.g.  $3522 - 1999$

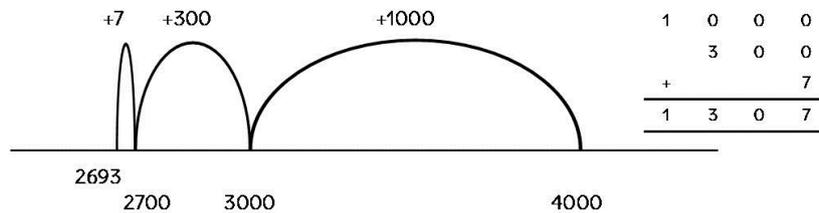
e.g.  $\text{£}64.86 - \text{£}19.99$

## Counting up

Find a difference between two numbers by counting up from the smaller to the larger

e.g.  $506 - 387$

e.g.  $4000 - 2693 = 1307$

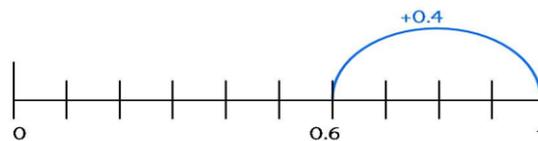


## Using number facts

Number bonds to 10 and 100 and derived facts

e.g.  $100 - 76 = 24$

e.g.  $1 - 0.6 = 0.4$



Number bonds to £1 and £10

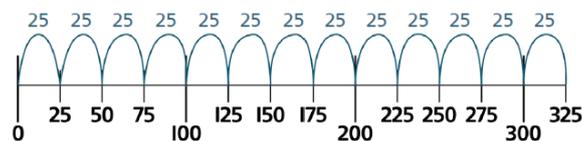
e.g.  $£1.00 - 86p = 14p$

e.g.  $£10.00 - £3.40 = £6.60$

## multiplication

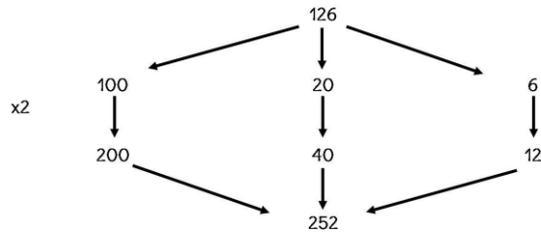
### Counting in steps

Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s



### Doubling

Find doubles to double 100 and beyond using partitioning



e.g. double 126

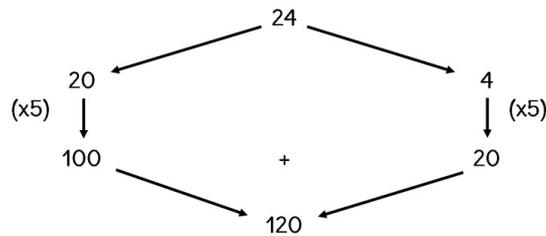
Begin to double amounts of money

e.g.  $\pounds 4.50 \times 2 = \pounds 9.00$

### Grouping

Use partitioning to multiply 2-digit numbers by 1-digit numbers

e.g.  $24 \times 5$



Multiply multiples of 100 and 1000 by 1-digit numbers using table facts

e.g.  $400 \times 8 = 3200$

Multiply near multiples by rounding

e.g.  $24 \times 19$  as  $(24 \times 20) - 24 = 456$

## Using number facts

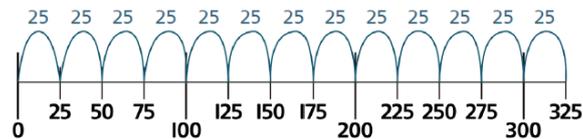
Know times-tables up to 12 x 12

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

## division

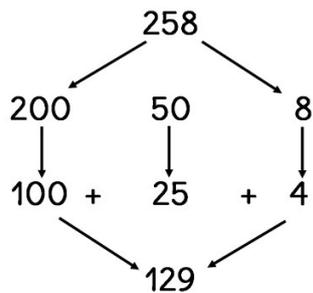
### Counting in steps

Count in 2s, 3s, 4s, 5s 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s



### Halving

Find half of even numbers to 200 and beyond using partitioning



e.g. find half of 2

Begin to halve amounts of money

e.g. £9 halved is £4.50

Use halving as a strategy in dividing by 2, 4 and 8

e.g.  $164 \div 4$  is half of 164 (82) halved again = 41

## Grouping

Use multiples of 10 times the divisor to divide by 1-digit numbers above the tables facts

e.g.  $45 \div 3$  as  $10 \times 3$  (30) and  $5 \times 3$  (15) - use times-table knowledge

Divide multiples of 100 by 1-digit numbers using division facts

e.g.  $3200 \div 8 = 400$

$32 \div 8 = 4$

$3200 \div 8 = 400$

## Using number facts

Know times-tables up to  $12 \times 12$  and all related division facts

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

## YEAR 5

### addition

#### Using place value

Count in 0.1s, 0.01s

e.g. know what 0.1 more than 0.51 is

#### Partitioning

e.g.  $2.4 + 5.8$  as  $2 + 5$  and  $0.4$  and  $0.8$  and combine the totals:  $7 + 1.2 = 8.2$

Add two decimal numbers by adding the 1s, then the 0.1s/0.01s

e.g.  $5.72 + 3.05$  as  $5.72 + 3 (8.72) + 0.05 = 8.77$

Add near multiples of 1

e.g.  $6.34 + .099$

e.g.  $5.63 + 0.9$

Count on from large numbers

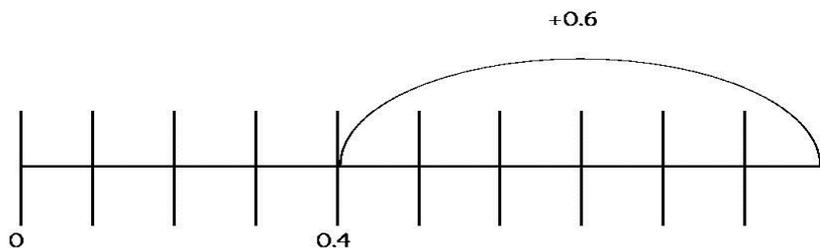
e.g.  $6834 + 3005$  as  $9834 + 5$

#### Using number facts

Number bonds to 1 and to the next whole number

e.g.  $5.7 + 0.3$

e.g.  $0.4 + 0.6$



Add to the next 10 from a decimal number

e.g.  $7.8 + 2.2 = 10$

## subtraction

### **Taking away**

Use place value to subtract decimals

e.g.  $4.58 - 0.08$

e.g.  $6.26 - 0.20 \rightarrow$  place holder zero for place value

Take away multiples of powers of 10

e.g.  $15672 - 300$

e.g.  $4.82 - 2$

e.g.  $2.71 - 0.5$

e.g.  $4.68 - 0.02$

**Partitioning** or counting back

e.g.  $3964 - 1051$

e.g.  $5.72 - 2.01$

Subtract near multiples of 1, 10, 100, 1000, 10 000 or £1

e.g.  $86456 - 9999$

e.g.  $3.58 - 1.99$

Find a difference between two amounts of money by counting up

e.g. Buy a toy for £6.89 using £10.00

$£6.89 - £7.00 = 11\text{p}$

$£7.00 - £10.00 = £3.00$

$£3.00 + 11\text{p} = £3.11$

### **Using number facts**

Derived facts from number bonds to 10 and 100

e.g.  $2 - 0.45$  using  $45 + 55 = 100$

e.g.  $3 - 0.86$  using  $86 + 14 = 100$

Number bonds to £1, £10 and £100

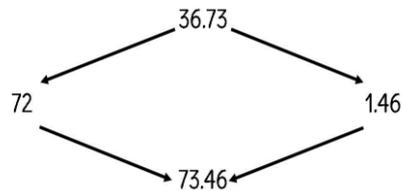
e.g.  $£4.00 - £3.86$

e.g.  $£100 - £66$  using  $66 + 34 = 100$

## multiplication

### **Doubling**

Double amounts of money using partitioning



e.g. double £6.73

Using doubling and halving as a strategy in multiplying by 2, 4, 8, 5 and 20

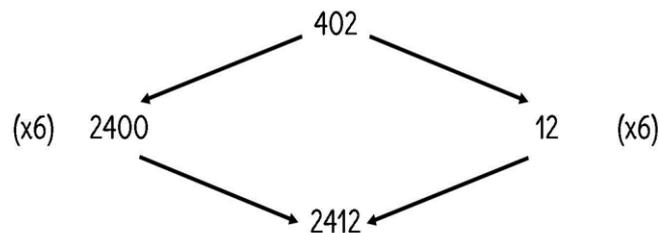
e.g.  $58 \times 5$  is half of  $58 \times 10$  ( $580$ ) = 290

### **Grouping**

Multiply whole numbers and decimals by 10, 100, 1000

e.g.  $3.4 \times 100 = 340$

Use partitioning to multiply 'friendly' 2-digit and 3-digit numbers by 1-digit numbers



e.g.  $402 \times 6$  as  $400 \times 6$  (2400) and  $2 \times 6$  (12) = 2412

### **Partitioning**

Use partitioning to multiply decimal numbers by 1-digit numbers

e.g.  $4.5 \times 3$  as  $4 \times 3$  (12) and  $0.5 \times 3$  (1.5) = 13.5

Multiply near multiples by rounding

e.g.  $32 \times 29$  as  $(32 \times 30) - 32 = 928$

## Using number facts

Use times-tables facts up to  $12 \times 12$  to multiply multiples of 10/100 of the multiplier

e.g.  $4 \times 6 = 24$  so  $40 \times 6 = 240$  and  $400 \times 6 = 2400$

Use knowledge of factors and multiples in multiplication

e.g.  $43 \times 6$  is double  $43 \times 3$

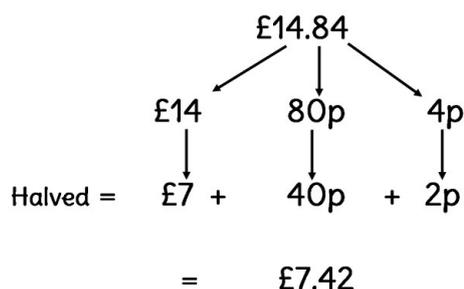
e.g.  $28 \times 50$  is half of  $28 \times 100$  ( $2800$ ) = 1400

Know square numbers and cube numbers

## division

### Halving

Halve amounts of money using partitioning



e.g. half of  $\text{£}14.84$  is half of  $\text{£}14$  ( $\text{£}7$ ) plus half of  $84\text{p}$  ( $42\text{p}$ )

Use doubling and halving as a strategy in dividing by 2, 4, 8, 5 and 20

e.g.  $115 \div 5$  as double 115 ( $230$ )  $\div 10 = 23$

Divide numbers by 10, 100, 1000 to obtain decimal answers with up to 3 decimal places

e.g.  $340 \div 100 = 3.4$

Use the 10th, 20th, 30th...multiple of the divisor to divide 'friendly' 2- and 3-digit numbers by 1-digit numbers

$$186 \div 6 = \square$$

$\square \times 6 = 186$	$186 \div 6 = 31$
$30 \times 6 = 180$	
$6$	$31$
$1 \times 6 = 6$	
$0$	$0$
$31$	$0$

e.g.  $186 \div 6$  as  $30 \times 6$  (180) and  $1 \times 6$  (6)

### Using number facts

Use division facts from the times-tables up to  $12 \times 12$  to divide multiples of powers of 10 of the divisor

e.g.  $3600 \div 9$  using  $36 \div 9$

Know square numbers and cube numbers

## YEAR 6

### addition

#### **Using place value**

Count in 0.1s, 0.01s, 0.001s  
e.g. know what 0.001 more than 6.725 is

#### **Partitioning**

e.g.  $9.54 + 3.23$  as  $9 + 3$ ,  $.05 + 0.2$  and  $0.04 + 0.03$ , to give 12.77

#### **Counting on**

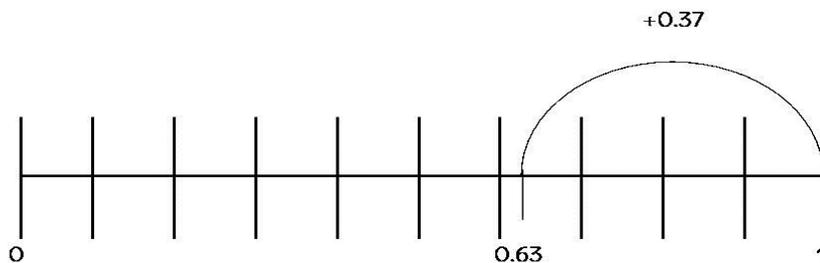
Add two decimal numbers by adding the 1s, then the 0.1s/0.01s/0.001s  
e.g.  $6.314 + 3.006$  as  $6.314 + 3$  ( $9.314$ )  $+ 0.006 = 9.32$

Add near multiples of 1  
e.g.  $6.345 + .0999$ —(add 1 then subtract .001)  
e.g.  $5.673 + 0.9$ —(add 1 then subtract .01)

Count on from large numbers  
e.g.  $16375 + 12003$  as  $28375 + 3$

#### **Using number facts**

Number bonds to 1 and to the next multiple of 1  
e.g.  $0.63 + 0.37$   
e.g.  $2.355 + 0.645$



Add to the next 10  
e.g.  $4.62 + 5.38$

## subtraction

### **Taking away**

Use place value to subtract decimals

e.g.  $7.782 - 0.08$

e.g.  $16.263 - 0.2$

Take away multiples of powers of 10

e.g.  $132956 - 400$

e.g.  $686109 - 40\ 000$

e.g.  $7.823 - 0.5$

**Partitioning** - or counting back

e.g.  $3964 - 1051$

e.g.  $5.72 - 2.01$

Subtract near multiples of 10

e.g.  $360\ 078 - 99\ 998$

e.g.  $12.831 - 0.99$

### **Counting up**

Find a difference between two decimal numbers by counting up from the smaller to the larger

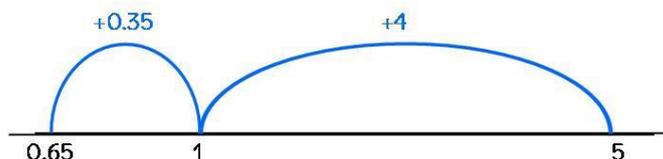
e.g.  $1.2 - 0.87$

### **Using number facts**

Derived facts from number bonds to 10 and 100

e.g.  $0.1 - 0.075$  using  $75 + 25 = 100$

e.g.  $5 - 0.65$  using  $65 + 35 = 100$



Number bonds to £1, £10 and £100

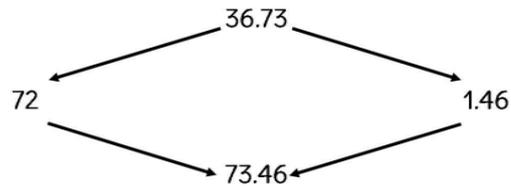
e.g.  $£7.00 - £4.37$

e.g.  $£100 - £66.20$  using  $20p + 80p = £1$  and  $£67 + £33 = £100$

## multiplication

### **Doubling and halving**

Double decimal numbers with up to 2 places using partitioning



e.g. double 36.73

Using doubling and halving as strategies in mental multiplication

### **Grouping**

Use partitioning as a strategy in mental multiplication, as appropriate

e.g.  $3060 \times 4$  as  $3000 \times 4$  (12 000) and  $60 \times 4$  (240) = 12 240

e.g.  $8.4 \times 8$  as  $8 \times 8$  (64) and  $0.4 \times 8$  (3.2) = 67.2

Use factors in mental multiplication

e.g.  $421 \times 6$  as  $421 \times 3$  (1263) doubled = 2526

e.g.  $3.42 \times 5$  as half of  $3.42 \times 10$  (34.2) = 17.1

Multiply decimal numbers using near multiples by rounding

e.g.  $4.3 \times 19$  as  $(4.3 \times 20) - 4.3 = 81.7$

### **Using number facts**

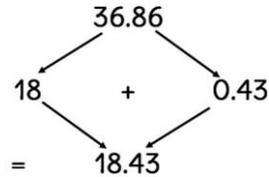
Use times-tables facts up to  $12 \times 12$  in mental multiplication of large numbers or numbers with up to 2 decimal places

e.g.  $6 \times 4 = 24$  and  $0.06 \times 4 = 0.24$

## division

### **Doubling and halving**

Halve decimal numbers with up to 2 places using partitioning



e.g. half of 36.86 is half of 36 (18) plus half of 0.86 (0.43)

### **Grouping**

Using the 10th, 20th, 30th, . . . or 100th, 200th, 300th . . . multiples of the divisor to divide large numbers

e.g.  $378 \div 9$  as  $40 \times 9$  (360) and  $2 \times 9$  (18), remainder 2

$$378 \div 9 = \square$$

$\square$	$\times 9 = 378$	$378 \div 9 = 42 \text{ r}2$
40	$\times 9 = 360$	
	18	
2	$\times 9 = 18$	
	2	
42		

Use tests for divisibility

e.g. 135 divides by 3, as  $1 + 3 + 5 = 9$  and 9 is in the 3 times table

### **Using number facts**

Know division facts from the times-tables up to  $12 \times 12$  to divide decimal numbers by 1-digit numbers

e.g.  $1.17 \div 3$  is  $1/100$  of  $117 \div 3$  (39)

Know tests of divisibility for numbers divisible by 2, 3, 4, 5, 9, 10 and 25