Overview of Progression in Addition
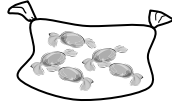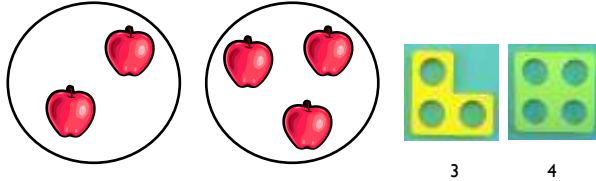
FOUNDATION

Calculation Strategies

Counting on from a number to find the total
I have 5 pennies in my tin. I put in one, two, three pence more. How many pennies are in the tin now?

Use moveable objects when finding totals.
Touch and align each object as it is counted.

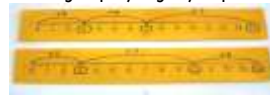Count first group, start count from first group's total when counting second group

3   4

YEAR 1

Calculation Strategies

3   2

3 + 2 = 5

Jane had 3 bears. She was given 2 more. How many does she have now?

Addition in any order
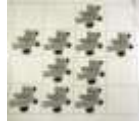Use numberline and Numicon to show that addition can be done in any order
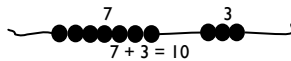
$$3 + 4 + 7 = 3 + 7 + 4$$

To support learning of number facts using a variety of visual resources:
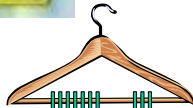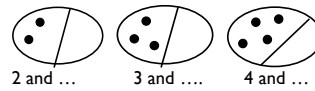
Bonds to 10

Flip flap

7 + 3 = 10

7   3

7 + 3 = 10

10 = 7 + 3

Make 6

2 and …   3 and ….   4 and …

0 and …   1 and ….   5 and ….
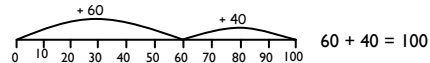
YEAR 2

Calculation Strategies

Number Stories

There are 50 people on the bus 16 more get on how many altogether?

Number bonds
Use knowledge of number bonds to 10 to help with bonds to 20 and multiples of 10 to 100

13   7

+ 60   + 40

0 10 20 30 40 50 60 70 80 90 100

$$60 + 40 = 100$$

Addition as partitioning and recombining:

42 + 36 =

40   30   =   70

42   +   36   =   78

2   6   =   8

$$12 + 23 = 12 + 20 + 3$$

23 + 15 =

+ 10   + 5

0   23   33   38
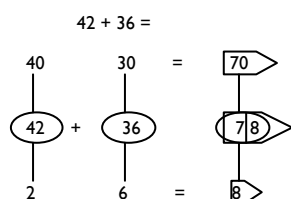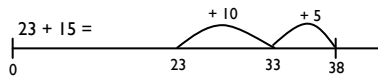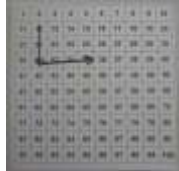
Overview of Progression in Addition
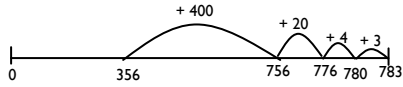
YEAR 3

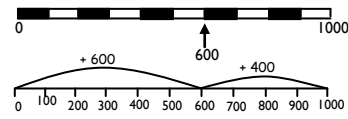### Calculation Strategies

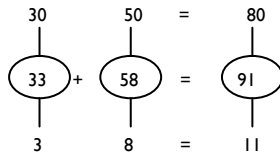**Addition: partitioning one number**

356 + 427

Number bonds to 1000 in multiples of 100

600 + 400 = 1000

Addition: partitioning both numbers

33 + 58

Stage 1 of column method:
Adding 10s first then units
(building on mental calculation strategies that add biggest numbers first)

```
   43
 + 54
 ----
   90
    7
 ----
   97
```

YEAR 4

Calculation Strategies

Stage 2 of column method:
Expanded Addition
Adding units first, then 10s, then 100s
(order reversed to build towards stage 3)

```
   358
 +  33
 -----
    11
    80
   300
 -----
   391
```

Leading to →

Stage 3 of column method:
Compact Method
Adding units first, then 10s, then 100s

```
   358
 +  33
 -----
   391
    1
```

(carrying units to tens or tens to hundreds)

8 + 3 is 11, carry the 10
50 + 30 + 10 is 90
300 + no hundreds is 300

YEAR 5

Calculation Strategies

Stage 3 of column method:
Compact Method

Extend to addition of 4 digit numbers

```
   3587
 + 675
 ------
   4262
   1 1 1
```

Extend to addition of more than 2 numbers

```
   671
    98
 + 468
 -----
  1237
   2 1
```

Extend to 1 place decimals

```
   72.5
 + 54.6
 ------
  127.1
      1
```

Extend to 2 place decimals

```
  £ 73.42
 +£ 84.73
 --------
 £158.15
       1
```

Overview of Progression in Addition

YEAR 6

Calculation Strategies

Compact method

```
  3481.9
    26.85
+    0.71
  3509.46      = 3509.46
   1  2
```

Addition with time:
Numberline method

The train leaves at 9.23 and the journey takes 1 hour 17 minutes. What time does it arrive?

+ 1 hour   +17 mins

9.23   10.23   10.40
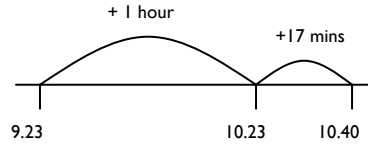
YEAR 7

Calculation Strategies

Compact method
Addition of mixed decimals

```
     2.68
   174.29
  1243.7
+   63.5
  1484.17
   112 1
```

Find the missing digits:

```
   3 6 □
+ □ 9 2
  5 □ 5
```

Addition of Fractions
Same denominator

$$\frac{1}{8} + \frac{5}{8} = \frac{6}{8} = \frac{3}{4}$$

Simple sequences

Extend:
5, 11, 17, …….(add on6)

Addition with negative numbers

-7 +2 = □

YEAR 8

Calculation Strategies

Compact method
Addition of mixed decimals

5.05 + 3.9 + 8 + 0.97:
```
    5.05
    3.9
    8
+   0.97
   17.92
    1 1
```

Addition of Fractions
Related denominators

$$\frac{3}{4} + \frac{1}{8} = ?$$

$$\frac{6}{8} + \frac{1}{8} = \frac{7}{8}$$

Extend and describe sequences

1, 3, 6, 10, ……..   (+1, +2, +3,….)

1, 4, 9 ,16,………   (+3, +5, +7, +9,….)

-7, -6, -4,………..   (+1, +2, +3,……)

Algebra type problems

e.g.

16 + C = 7
Find the value of C

YEAR 9

Calculation Strategies

Compact method
Addition of mixed decimals

6543 + 590.005 + 0.0045:
```
   6543
    590.005
+     0.0045
   7133.0095
          1
```
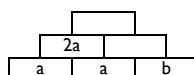
Addition of Fractions
Mixed denominators

$$\frac{1}{6} + \frac{3}{8} = \qquad \frac{4}{24} + \frac{9}{24} = \frac{13}{24}$$

(lowest common multiple = 24)

Addition of simple algebraic expressions

Simplify 2a + 3b + a + 2b

	2a	
a	a	b

Pyramid problems
Complete the pyramids:

	22	
	8	
		9