Overview of Progression in Multiplication

FOUNDATION

Calculation Strategies

Laying foundations for multiplying by maximising opportunities when counting

Number rhymes such as two, four, six, eight
Ten fat sausages

Hop along in twos on a large number track

Counting in pairs
e.g. pairs of children
pairs of socks
pairs of animals
eggs in an egg box

Animals in 2s on farm

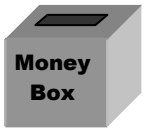
YEAR 1

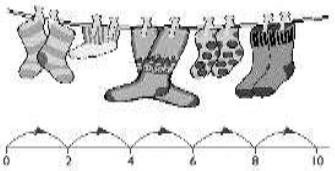
Laying foundations for multiplying by maximising opportunities when counting

To aid visually – seeing a pattern in the final digit

- Use 100 grid to discuss patterns counting in 2s, 5s and 10s

				5					10
				15					20
				25					30





"1, 2, 3, 4, 5 ....."

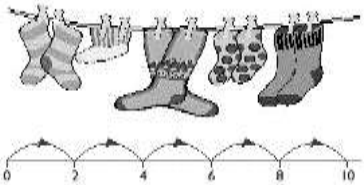
"10, 20, 30, 40, 50 ....."

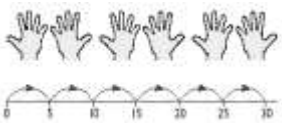
Dropping 2 / 5 / 10ps in a box
How much money is in the box?
How many 2 / 5 / 10ps are in the box?
If I added two more 2 / 5 / 10ps what would I have counted to?
How many 2 / 5 / 10ps are in the box altogether?

YEAR 2

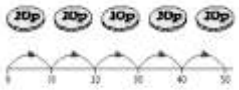
Calculation Strategies

As repeated addition





5 + 5 + 5 + 5 + 5 + 5 = 30
5 x 6 = 30
5 multiplied by 6
6 groups of 5
6 hops of 5



10p + 10p + 10p + 10p + 10p = 50p
10p x 5 = 50p
5 hops of 10

As an array

3 x 4 = 12

4 x 3 = 8

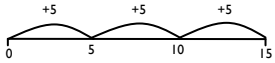
Overview of Progression in Multiplication

YEAR 3

Calculation Strategies

Multiplication as repeated addition

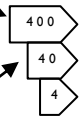
5 x 3
5 multiplied by 3
3 lots of 5
3 hops of 5



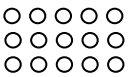
H	T	U
□□□□ 4	□□□□ 4	□□□□ 4
		0
		0

When X 100 move digits two place to left

When X 10 move digits one place to left

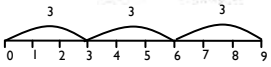


Multiplication as an array



5 x 3
5 columns of 3
3 x 5
3 rows of 5

Scaling



This will lead to work on proportion in Y4

YEAR 4

Calculation Strategies

x	30	8
7	210	56

= 266

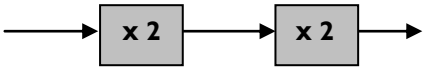
Multiplication Grid ITP

Children should be taught to recognise special case strategies, eg:

13 x 9
13 x 11 → multiply by 10 and adjust

x4 (x2, x2) etc…..

Multiplying by 4 as double and double



YEAR 5

Calculation Strategies

Grid method

253 x 6

x	200	50	3
6	1200	300	18

1200
300
+ 18
1518

43 x 56

x	50	6
40	2000	240
3	150	18

2240
+ 168
2408

NB
Place value cards still used to support partitioning, to ensure the process is explicit.

Overview of Progression in Multiplication

YEAR 6

Calculation Strategies

Grid method → **Expanded Multiplication**

x	30	8
7	210	56

38 × 7
210 (30 × 7)
56 (8 × 7)
266

x	50	6
20	1000	120
7	350	42

1120 + 392 = 1512

56 × 27
1000 (50 × 20)
120 (6 × 20)
350 (50 × 7)
42 (6 × 7)
1512

NB
Place value cards still used to support partitioning, to ensure the process is explicit.

Grid method
HTU x TU

x	300	70	2
20	6000	1400	40
4	1200	280	8

7440 + 1488 = 8928

Mental Calculation with decimals

0.3 x 6 = ?
3 x 6 = 18
0.3 x 6 = 1.8

YEAR 7

Calculation Strategies

Grid Method

x	200	70	3
30	6000	2100	90
6	1200	420	18

273 x 36 = 9828

6000
2100
90
1200
420
+ 18
9828

Expanded Multiplication

73 × 36
2100 (70 × 30)
420 (70 × 6)
90 (3 × 30)
18 (3 × 6)
2628

73 x 36 = 2628

Problems involving missing digits

x	70	□
□	2100	□
6	□	18

Mental Calculations involving decimals

4.92 x 3

4 x 3 = 12.00
0.9 x 3 = 2.70
0.02 x 3 = 0.06
14.76

Explain how an error has been made:

x	40	3
5	20	15

20 + 15 = 35

43 x 5 = 35

YEAR 8

Calculation Strategies

Grid Method

x	50	6
2	100	12
0.3	15	1.8

56 x 2.3 = 38.8

100.0
12.0
15.0
1.8
128.8

x	5	0.6
2	10	1.2
0.3	1.5	0.18

5.6 x 2.3 = 3.88

10.00
1.20
1.50
0.18
12.88

Expanded Multiplication

5.6 × 2.3
10.00 (5 × 2)
1.50 (5 × 0.3)
1.20 (0.6 × 2)
0.18 (0.6 × 0.3)
12.88

Explain how an error has been made:

52 x 43 = 436

52 × 43
200 (50 × 4)
150 (50 × 3)
80 (2 × 40)
6 (2 × 3)
436

YEAR 9

Calculation Strategies

3(a + b) = 3a + 3b

x	a	b
3	3a	3b

Using a calculator, use a trial and improvement method to solve:

60 x □ = 35 ….. 6.7 x □ = 6.8

$n^2 = 35$