PROGRESSION IN WRITTEN MULTIPLICATION

Pre-learning 1

Practical and informal written methods using concrete objects and pictorial representations

(see Models and Images poster)

Arrays

Use real objects to demonstrate arrays and count in groups:

2 x 6 = 12

3 x 4 = 12

Repeated addition

Place objects into equal groups:

2 x 3 = 6

Multiplication tables

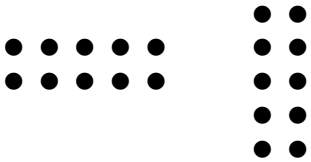
Count in 2s, 5s and 10s

Pre-learning 2

UxU using concrete objects, pictorial representations and mentally

Arrays

(model using counters, peg boards and real objects)

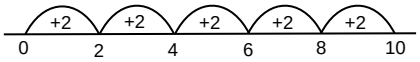


5 x 2 = 2 x 5

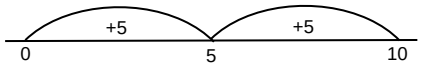
Repeated addition

(model on a bead string, number line and peg board)

2 x 5 = 10
2 x 5 = 2 + 2 + 2 + 2 + 2



5 x 2 = 10
5 x 2 = 5 + 5



Multiplication tables

2, 5 and 10 multiplication tables modelled as arrays and repeated addition on a number line and practised using rhythm, songs and games.

Make connections between the tables/ facts:
10x table related to place value;
5x table related to 10x table by halving and to the divisions on a clock face;
2x table related to doubling.

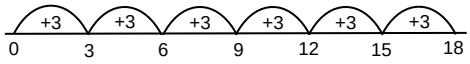
Y3

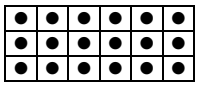
UxU & TUxU using concrete objects, pictorial representations and mentally

One-digit x one-digit

(model on a number line, 100 square, peg board and using arrays)

3 x 6 = 18





One-digit x multiple of ten

(model using a place value slider and base ten)

3 x 50 = 3 x 5 x 10
= 15 x 10
= 150

Rules of multiplication

Recognise that multiplication can be done in any order:
4 x 12 x 5 = 4 x 5 x 12
= 20 x 12
= 240

Multiplication tables

3, 4 and 8 multiplication tables modelled as arrays and repeated addition on a number line and practised using rhythm, songs and games.

Make connections between the tables/ facts:
4x and 8x tables related to the 2x table by doubling;
Commutativity means key facts (2x, 5x, 10x) are already known;
Relate to division facts.

Two-digit x one-digit

(model as an array)

23 x 4 =

x	20	3
4	80	12

80 + 12 = 92

Y4

Grid method for HTUxU, leading to column written method for TUxU and HTUxU

Multiplication tables

6, 12, 9, 7 and 11 multiplication tables modelled as arrays and repeated addition on a number line and practised using rhythm, songs and games.
Make connections between the tables/ facts.

Rules of multiplication

Commutative law:
4 x 12 = 12 x 4

Associative law:
(2 x 3) x 4 = 2 x (3 x 4)

Distributive law:
39 x 7 = (30 x 7) + (9 x 7)

Three-digit x one-digit

(model as an array)

146 x 7 =

x	100	40	6
7	700	280	42

700 + 280 + 42 = 1022

Leading to…

146 x 7 =

146
x 7
700 (100 x 7)
280 (40 x 7)
42 (6 x 7)
1022

Leading to formal short multiplication:

146 x 7 =

146
x 7
1022
1 3 4

Y5

Column written method for HTUxU & ThHTUxU and grid method for TUxTU & HTUxU

Multiplication tables

Continue to practise all multiplication tables facts up to 12 x 12 using counting, rhythm, songs, games and patterns.

Short multiplication

4346 x 8 =

4346
x 8
34768
2 3 4

Also with decimals:

4.92 x 3 =

4.92
x 3
14.76
1 2

Long multiplication

(model as an array)

Practise TU x TU and HTU x TU

352 x 24 =

x	300	50	2
20	6000	1000	40
4	1200	200	8

7040 + 1408 = 8448

Y6

Column written method for HTUxTU & ThHTUxTU

Multiplication tables

Continue to practise all multiplication tables facts up to 12 x 12 using counting, rhythm, songs, games and patterns.

Formal long multiplication

Relate to grid method:

24 x 32 =

24
x 32
48 (24 x 2)
720 (24 x 30)
768

352 x 24 =

352
x 24
1408 (352 x 4)
7040 (352 x 20)
8448

2418 x 36 =

2418
x 36
14508 (2418 x 6)
72540 (2418 x 30)
87048