Multiplication – Pencil and paper method

Expectations for each year group:

Year 3: Write and calculate mathematical statements for multiplication using the multiplication tables they know, including for two-digit numbers times one-digit numbers using mental and progressing to formal written methods.
Solve problems involving multiplication.

Year 4: Multiply two-digit and three-digit numbers by a one-digit number using formal written methods.
Solve word problems involving the four operations

Year 5: Multiply numbers up to 4 digits by a 1 or 2-digit number using a formal written method, including long multiplication for two-digit numbers.
Solve problems involving multiplication

Year 6: Multiply multi-digit numbers up to 4-digits by a two-digit whole number using the formal written method of long multiplication
Solve problems involving multiplication.
Multiply one-digit numbers with up to two decimal places by whole numbers

Key skills to support understanding:

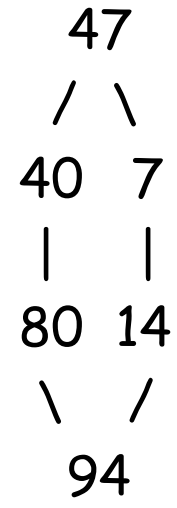
- Arrays
- repeated addition
- times tables
- place value
- commutative law i.e. multiplication can be done in any order
- distributive law i.e. 30 x 7 + 9 x 7 = 39 x 7
- multiplying numbers by 10, 100, 1000
- patterns of similar calculations
- Models and images
- Reasoning: provide opportunities e.g., 'Talk it, Solve it' and White Rose activities.

Multiplication – Pencil and paper method

Doubling – the 'diamond' method:

Diamond Method:

Double



Grid method - informal

TU x U

23 x 8 =

Approximate first. E.g. 23 x 8 is approximately 20 x 10 = 200

x	20	3		
8	160	24	=	184

* Multiply by least significant digit first

Multiplication – Pencil and paper method

TU x TU

72 x 38 =

Approximate first. E.g. 72 x 38 is approximately 70 x 40 = 2800

x	70	2		
30	2100	60	=	2160
8	560	16	+	576
				2736

* Multiply by least significant digit first

Transition from grid method to standard written method

Teach grid method alongside column written method. But start with least significant digit rather than significant digit

x	20	3		
8	160	24	=	184

Multiplication – Pencil and paper method

TU x TU

x	70	2		
30	2100	60	=	2160
8	560	16	=	+ 576
				2736
				1

Standard written method - formal

TU x U

Approximate first. E.g. 23 x 8 is approximately 20 x 10 = 200

```
  23
x  8
----
 184
 2
```

Multiplication – Pencil and paper method

TU x TU

72 x 38 =

Approximate first. E.g. 72 x 38 is approximately 70 x 40 = 2800

		72
	x	38
72 x 8		576
		1
72 x 30		2160
		2736
		1