We continually reflect on our practice in order to deliver engaging and challenging Maths lessons to all age groups and abilities. We strive to make lessons relevant with links to real life situations. There is an emphasis on applying number skills to investigations and problem solving. A wide range of resources, including Numicon, are used to support and guide learning. Please contact your child's teacher or Mrs Newman the Maths leader, if you would like any further information.

Ashurstwoodprimary.co.uk

Ashurst Wood Primary School

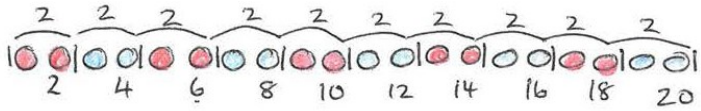
Multiplication Calculation Leaflet

This leaflet provides information for parents on written calculations in the school. Methods for solving calculations have changed over the years. The aim of this leaflet is to help parents to understand current learning principles in order to support children at home. Phases 1 and 2 relate to KS1 and Phases 3-6 relate to KS2. Our Calculations Policy has been developed using classroom research conducted nationwide and the new National Curriculum requirements.

PHASE ONE	1
	Count in 2s
	Count in 10s
	Doubles up to 10
	Count in 5s
	Double multiples of 10
	Count in 2s, 5s and 10s

Counting in steps ('Clever' counting)

Count in 2s and 10s

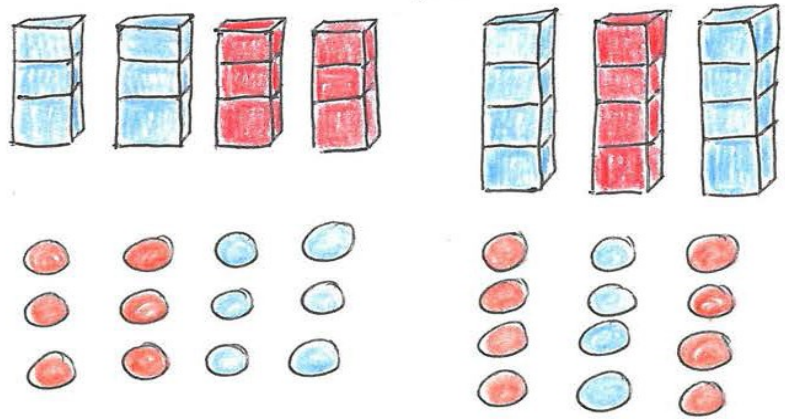


Doubling and halving

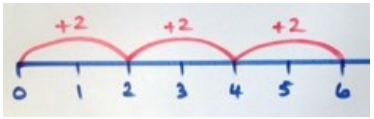
Find doubles to double 6 using fingers

Grouping

Begin to use visual and concrete arrays and 'sets of' objects to find the answers to '3 lots of 4' or '2 lots of 5', etc.



2 frogs on each lily pad.



With jottings— or in your head
Solve one---step problems involving multiplication and division, by calculating the answer using concrete objects,
Pictorial representations and arrays with the support Of the teacher

Just know it
Count in multiples of twos, fives and tens

PHASE SIX – Written addition

Short multiplication of 2-digit, 3-digit and 4-digit numbers by 1-digit numbers

Long multiplication of 2-digit, 3-digit and 4-digit numbers by 2-digit numbers

```
 3875
x   6
 543
23250
```

Short multiplication of decimal numbers using x100 and ÷100, e.g. 13.72 x 6 as 1372 x 6 ÷ 100

Short multiplication of money, £13.72 x 6

Grid multiplication of numbers with up to 2 decimal places by single digit numbers

Multiplying proper and improper fractions, e.g. $\frac{3}{4} \times \frac{2}{3}$

NB Grid multiplication provides a default method for ALL children

With jottings ….. Or in your head
Perform mental calculations, including with mixed operations and large numbers

Just know it
Recall x and ÷ facts for x tables up to 12 x 12.

Recall prime numbers up to 19 know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})

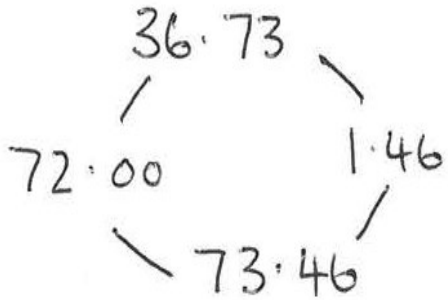
PHASE SIX – Mental multiplication

6
Multiplication facts up to 12 x 12
Partition to multiply mentally
Double larger numbers and decimals
Multiplication facts up to 12 x 12
Partition to multiply mentally
Double larger numbers and decimals

Multiply multi---digit numbers Up to 4 digits by a two---digit whole Number using the formal written method of long multiplication

Doubling and halving

Double decimal numbers with up to 2-places using partitioning, *e.g. 36.73 doubled is double 36 (72) plus double 0.73 (1.46)*



Use doubling and halving as strategies in mental multiplication

Grouping

Use partitioning as a strategy in mental multiplication, as appropriate, *e.g. 3060 x 4 as (3000 x 4) + (60 x 4) or 8.4 x 8 as 8 x 8 (64) and 0.4 x 8 (3.2)*

Use factors in mental multiplication, *e.g. 421 x 6 as 421 x 3 (1263) doubled (2526) or 3.42 x 5 as half of (3.42 x 10)*

Multiply decimal numbers using near multiples by rounding, *e.g. 4.3 x 19 as 4.3 x 20 (86 – 4.3)*

Using number facts

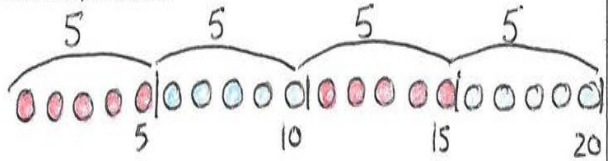
Use times tables facts up to 12 x 12 in mental multiplication of large numbers or numbers with up to two decimal places, *e.g. 6 x 4 = 24 and 0.06 x 4 = 0.24*

PHASE TWO – Mental multiplication

2
2 x table
10 x table
Doubles up to 20 and multiples of 5
5 x table
Count in 3s
2 x, 5 x and 10 x tables

Counting in steps ('Clever' counting)

Count in 2s, 5s and 10s



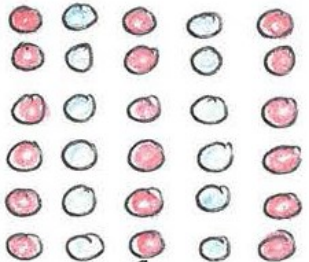
Begin to count in 3s

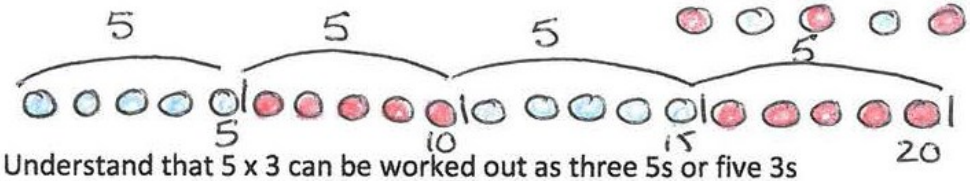
Doubling and halving

Begin to know doubles of multiples of 5 to 100, *e.g. double 35 is 70*

Grouping

Use arrays to find answers to multiplication and relate to 'clever' counting, *e.g. 3 x 4 as three lots of four things and 6 x 5 as six steps in the 5s count as well as six lots of five*

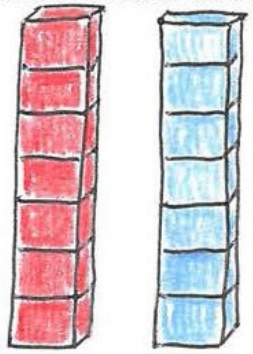




Understand that 5 x 3 can be worked out as three 5s or five 3s

Using number facts

Know doubles to double 20



Double 7 = 14

Start learning 2x, 5x, 10x tables, relating these to 'Clever counting' in 2s, 5s, and 10s, *e.g. 5 x 10 = 50, and 10, 20, 30, 40, 50 is five steps in the tens count*

Calculate mathematical statements for multiplication and division within the multiplication tables and write them using
The multiplication (×), division (÷) and equals (=) signs

5 frogs on each lily pad 5 x 3 = 15

5 x 2 = 2 x 5

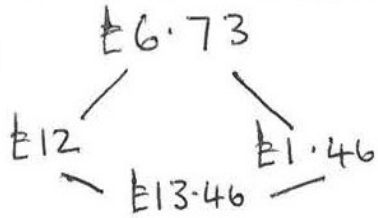
Build tables on counting stick

Link to repeated addition

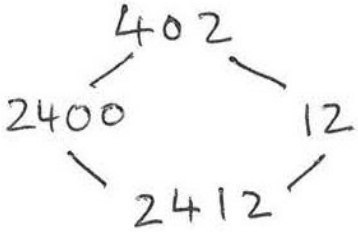
With jottings— or in your head
Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot Solve problems involving multiplication and division, using materials, arrays, Repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Just know it
Recall and use x and ÷ facts for the 2, 5 and 10 x tables, including recognising odd and even numbers.

Doubling and halving
Double amounts of money using partitioning, *e.g. £6.73 doubled is double £6 (£12) plus double 73p (£1.46)*
Use doubling and halving as a strategy in multiplying by 2, 4, 8, 5 and 20.
E.g. 58 x 5 = ½ of 58 (29) X 10 (290)



Grouping
Multiply decimals by 10, 100, 1000, *e.g. 3.4 x 100 = 340*
Use partitioning to multiply friendly 2-digit and 3-digit numbers by single-digit numbers.
E.g. 402 x 6 as 400 x 6 (2400) and 2 x 6 (12)



Use partitioning to multiply decimal numbers by single-digit numbers, *e.g. 4.5 x 3 as (4 x 3) + (4 x 0.5)*
Multiply using near multiples by rounding, *e.g. 32 x 29 as (32 x 30) – 32*

Using number facts
Use times tables facts up to 12 x 12 to multiply multiples of the multiplier, *e.g. 4 x 6 = 24 so 40 x 6 = 240 and 400 x 6 = 2400*
Know square numbers and cube numbers

PHASE FIVE — Written multiplication

Short multiplication of 2-digit, 3-digit and 4-digit numbers by 1-digit numbers

```
 387
x  6
 54
2322
```

Long multiplication of 2-digit, 3-digit and 4-digit numbers by teen numbers

Grid multiplication of numbers with up to 2 decimal places by single digit numbers

```
 387
x  14
3870
1548
5418
```

Multiplying fractions by single digit numbers
E.g. ¾ x 6 = $^{18}/_{4}$ which is 4 $^{2}/_{4}$ = 4½

NB Grid multiplication provides a default method for ALL children

PHASE FOUR – Written multiplication

Use grid multiplication to multiply 3-digit by 1-digit numbers

x	200	50	3
6	1200	300	18

= 1518

Use a vertical written algorithm (ladder) to multiply 3-digit numbers by 1-digit numbers

```
 253
X   6
1200
 300
  18
1518
```

Use grid multiplication to multiply 2-digit numbers by 2-digit numbers

x	40	6
10	400	60
8	320	48
	720	108

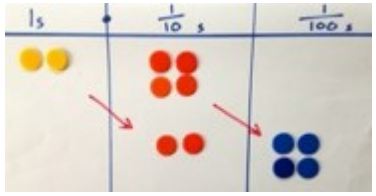
= 828

PHASE FIVE – Mental multiplication

5
4x, 8x tables 100, 1000 times bigger
3x, 6x and 12x tables 10, 100, 1000 times smaller
Double larger numbers and decimals
3x, 9x tables
11x , 7 x tables Partition to multiply mentally
6x, 12 x tables

Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two- digit numbers

If I know 4 x 6 then 0.4 x 6 is ten times



With jottings ….. Or in your head

Multiply and divide numbers mentally drawing upon known facts Multiply and divide whole numbers and those involving decimals by 10, 100 And 1000 Identify multiples and factors, including finding all factor pairs Of a number, and common factors of two numbers establish whether a Number up to 100 is prime

Just know it

Recall prime numbers up to 19 know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})

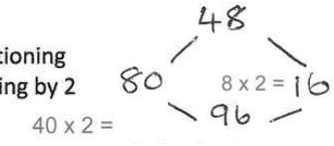
PHASE THREE – Mental multiplication

3
Review 2x, 5x and 10x
4x table
Double two digit numbers
8 x table
3 x table
6 x table or review others

Write and calculate mathematical statements for ÷ using the x tables they know progressing To formal written methods.

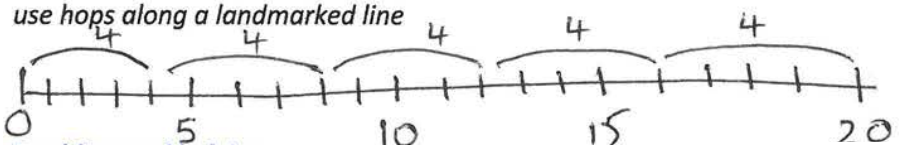
Doubling and halving

Find doubles to double 50 using partitioning
Use doubling as a strategy in multiplying by 2
E.g. 18 x 2 is double 18 (36)



Counting in steps ('Clever' counting)

Count in 2s, 3s, 4s, 5s, 8s and 10s, *e.g. colour the multiples on a 1-100 grid or use hops along a landmarked line*



Grouping

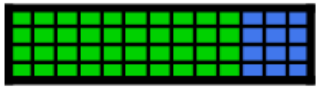
Recognise that multiplication is commutative, *e.g. 4 x 8 ≡ 8 x 4*
Multiply multiples of 10 by single digit numbers, e.g. 30 x 8 = 240
Multiply friendly 2-digit numbers by single digit numbers, *e.g. 13 x 4*

Using number facts

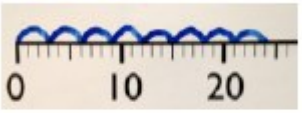
Know doubles to 20 and doubles of multiples of 5 to 100, *e.g. double 45 is 90*
Know doubles of multiples of 5 to 100, *e.g. double 85 is 170*
Know 2x, 3x, 4x, 5x, 8x, 10x tables facts

If I know 10 x 8 = 80 then …

So 13 x 4 = 10 x 4 + 3 x 4



Build tables on counting stick



PHASE THREE – Written multiplication

Build on partitioning to develop grid multiplication

×	20	3	
4	80	12	= 92

With jottings ….. Or in your head
Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two---digit numbers times one---digit numbers, using mental methods

Just know it
Recall and use x and ÷ facts for the 3, 4 and 8 times tables.

PHASE FOUR – Mental multiplication

4
4x, 8x tables 10 times bigger
3x, 6x and 12x tables
Double larger numbers and decimals
3x, 9x tables
11x, 7 x tables
6x, 12 x tables

If I know 4 x 6 = 24
then 40 x 6 is ten times bigger,
40 x 60 is one hundred times bigger.

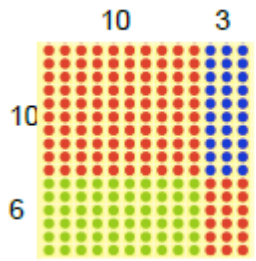
Multiply two-digit and three-digit numbers by a one-digit number using formal written layout

43 x 6 by partitioning

X	40	3
6	240	18

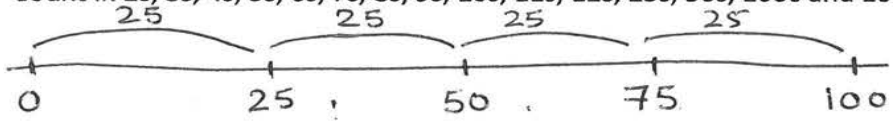
40 x 6 = 240
3 x 6 = 18
43 x 6 = 258

13 x 16 by partitioning

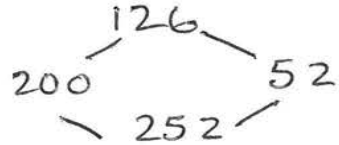


100 + 30 + 60 + 18 = 208
Build tables on counting stick

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



Doubling and halving
Find doubles to double 100 and beyond using partitioning
Begin to double amounts of money.
E.g. £3.50 doubled is £7



Use doubling as a strategy in multiplying by 2, 4 and 8, *e.g. 34 x 4 = double 34 (68) doubled again (136)*

Grouping
Use partitioning to multiply 2-digit numbers by single-digit numbers
Multiply multiples of 100 by single digit numbers using tables facts, *e.g. 400 x 8 = 3200*
Multiply using near multiples by rounding, *e.g. 24 x 19 as (24 x 20) – 24*

Using number facts - Know times tables up to 12 x 12

With jottings ….. Or in your head
Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers Recognise and use factor pairs and commutativity in Mental calculations

Just know it
Recall x and ÷ facts for x tables up to 12 x 12.