## FOUNDATION STAGE

| FOUNDATION STAGE |  |  |  |
| :---: | :---: | :---: | :---: |
| ADDITION | SUBTRACTION | MULTIPLICATION | DIVISION |
| Children begin to record in the context of play or practical activities and problems |  |  |  |
| Model vocabulary and encourage children to explain their process. <br> Use real life contexts and practical equipment. <br> Begin to relate addition to combining two groups of objects <br> - Use of games, songs and practical activities $\dagger$ o begin using vocabulary <br> - Construct number sentences to go with practical activities <br> - Solve simple word problems using their fingers <br> e.g. Can find one more to ten. <br> - Make a record in pictures, words or symbols of addition activities already carried out. <br> Higher Ability/Gifted and Talented Count forwards along the number line using finger. | Model vocabulary and encourage children to explain their process. <br> Use real life contexts and practical equipment <br> Begin to relate subtraction to 'taking away' <br> - Use of games, songs and practical activities to begin using vocabulary <br> - Construct number sentences to go with practical activities <br> - Solve simple word problems using their fingers <br> e.g. Can find one less to ten. <br> - Take away objects and count how many are left <br> - Make a record in pictures, words or symbols of subtraction activities already carried out <br> Higher Ability/Gifted and Talented Count backwards along a number line using finger. | Model vocabulary and encourage children to explain their process. <br> Use real life contexts and practical equipment <br> Begin to relate multiplication as 'repeated addition' <br> - Count in repeated groups of the same size <br> - Count/Chant in twos, fives and tens <br> - Make a record in pictures, words or symbols of groups of 2,5 and 10. | Model vocabulary and encourage children to explain their process. <br> Use real life contexts and practical equipment <br> Begin to relate division as 'sharing equally' <br> - Share objects into equal groups e.g. fruit at break time; sweets on a child's birthday; sharing activities in all areas <br> - Make a record in pictures, words or symbols of sharing into groups of 2,5 and 10. |

## YEAR ONE

Children need to understand the concept of equality when using the ' $=$ ' sign.
Calculations should be written either side of the equality sign, so that the sign is not just interpreted as 'the answer'.

| ADDITION |
| :--- |
| $+=$ signs and missing numbers |
| Missing numbers need to be placed in |
| all possible places. |
| $3+4=\square$ |
| $3+\square=7$ |$\quad \square=3+4$

## Understand addition as combining two groups

Make a record in pictures, words or symbols of addition activities.


## The Number Line

They use number lines and practical resources to support calculations and teachers demonstrate the use of the number line.
Use a numbered line to count on in ones.
7+4


- = signs and missing numbers

Missing numbers need to be placed in all possible places.

| $7-3=\square$ | $\square=7-3$ |
| :--- | :--- |
| $7-\square=4$ | $4=\square-3$ |
| $\square-3=4$ | $4=7-\square$ |
| $\square-\nabla=4$ | $4=\square-\nabla$ |

Understand subtraction as 'take away'
Make a record in pictures, words or symbols of subtraction activities.


## The Number Line

They use number lines and practical resources to support calculations and teachers demonstrate the use of the number line.
Use a numbered line to count back in ones. 11-7 = 4
$\begin{array}{lllllllllllll}0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 & 11 & 12\end{array}$

Use a number line to find a difference by counting on. 11-7=4

Counting
Count/Chant in $2 s, 5 s$ and $10 s$ Group and count objects in $2 s, 5 s$ and 10s

Understand multiplication as 'repeated addition'


Teacher to demonstrate:
$5+5+5+5=20$
4 groups of 5 equals 20

For both of the above, the activities should be practical and a record should be made in pictures, words or symbols.

Understand division as sharing equally
8 apples are shared between two people. How many do they have each?

$8 \div 2=4$
Understand division as 'repeated subtraction' OR grouping
There are ten cakes. Put two on each plate. How many plates do you need?


## $10 \div 2=5$

As you share emphasise that you are taking away the same number each time.

For both of the above, the activities should be practical and a record should be made in pictures, words or symbols.

## YEAR TWO

Children need to understand the concept of equality when using the ' $=$ ' sign.
Calculations should be written either side of the equality sign, so that the sign is not just interpreted as 'the answer'.


| 100 square | 100 square |
| :---: | :---: |
| Add 9 or 11 by adding 10 and adjusting by 1 | Subtract 9 or 11 by subtracting 10 and adjusting by 1 |
| $35+9=44$ | 35-9 = 26 |
| Using the 100 square, demonstrate: | Using the 100 square demonstrate : |
| $35+10=45$ | $35-10=25$ |
| 45-1 = 44 | $25+1=26$ |
| Explaining/Showing that adding 10 and subtracting 1 is the same as adding 9. | Explaining/Showing that subtracting 10 and then adding 1 is the same as subtracting 9 . |
| $35+11=46$ |  |
| Using the 100 square, demonstrate: | 35-11 $=24$ |
| $35+10=45$ | Using the 100 square demonstrate : |
| $45+1=46$ | $35-10=25$ |
| Explaining/Showing that adding 10 then | 25-1 = 24 |
| adding 1 is the same as adding 11. | Explaining/Showing that subtracting 10 and then subtracting 1 is the same as subtracting 11. |

## YEAR THREE

Children need to understand the concept of equality when using the ' $=$ ' sign.
Calculations should be written either side of the equality sign, so that the sign is not just interpreted as 'the answer'
ADDITION

Continue using a range of equations as in Y 1 and 2 but with appropriate numbers.

TU+TU, then HTU+TU, HTU+HTU

## Number Line

## Counting on

Review:


Then:


## Partition and recombine

$89+42=181 \quad 9+2=11$

$$
\begin{aligned}
& 80+90=170 \\
& 170+11=181
\end{aligned}
$$

Adding the least significant digits

## first

| 75 |  |
| ---: | ---: |
| $+\frac{48}{13}$ |  |
| $\frac{110}{123}$ | $+\frac{267}{12}$ |
|  | 140 |
|  | $\underline{200}$ |

SUBTRACTION

- = signs and missing numbers

Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.

TU-TU, then HTU-TU, HTU-HTU

## Number Line

## Counting back

$47-24=23$


## Counting on

$94-46=58$


MULTIPLICATION
$x=$ signs and missing numbers Continue using a range of equations as in Year 2 but with appropriate numbers

## Understand multiplication as

 'repeated addition'
## Arrays



Commutativity
Arrays


Partitioning to multiply 'teen' numbers

$$
\begin{array}{ll}
16 \times 3=48 & 6 \times 3=18 \\
& 10 \times 3=30 \\
& 30+18=48
\end{array}
$$

$\div=$ signs and missing numbers
Continue using a range of equations as in Year 2 but with appropriate numbers

Understand division as sharing equally
12 sweets shared between 3 people How many do they have each?

$12 \div 3=4$
Understand division as 'repeated subtraction' OR grouping
There are 24 sweets. Put 4 in each box. How many boxes do you need?


## $24 \div 4=6$

See as: How many 4s make 24?
Emphasise that you are taking away the same number each time.

## Number Line

Repeated subtraction to divide can also be shown on a number line.

\(\left.$$
\begin{array}{|l|l|l|l|}\hline & & & \begin{array}{l}\text { Remainders } \\
\text { Need a good knowledge of } \\
\text { multiplication and division tables. } \\
\text { Also do as word problem. } \\
\text { e.g. There are 16 children. They are } \\
\text { put in teams of 3. How many teams } \\
\text { are there? How many children are } \\
\text { left over? }\end{array}
$$ <br>
16 \div 3= <br>

How many 3s in 16?\end{array}\right\}\)| $5 \times 3=15$ |
| :--- |
| If you used 15, how much is left over |
| (remainder)? |
| $16-15=1$ |

## YEAR FOUR

Children need to understand the concept of equality when using the ' $=$ ' sign.
Calculations should be written either side of the equality sign, so that the sign is not just interpreted as 'the answer'


|  |  |  |  |
| :---: | :---: | :---: | :---: |

## YEAR FIVE

Children need to understand the concept of equality when using the ' $=$ ' sign.
Calculations should be written either side of the equality sign, so that the sign is not just interpreted as 'the answer'.


## Extend to decimals

Add two or more decimal fractions with up to three digits and the same number of decimal places. Know that decimal points should line up under each other.

## Extend to decimals

Find the difference between two decimal fractions with up to three digits and the same number of decimal places. Know that decimal points should line up under each other.

| $x=$ signs and missing numbers Continue using a range of equations as in Year 2 but with appropriate numbers |  |  |
| :---: | :---: | :---: |
| HTU $\times U$ and $T U \times T U$ |  |  |
| Partitioning |  |  |
| 346 | Lead to | 346 |
| $\begin{array}{r}346 \\ \times \quad 9 \\ \hline\end{array}$ | $\times$ | 9 |
| 54 | $(6 \times 9)$ | $\frac{3114}{45}$ |
| 360 | $(40 \times 9)$ |  |
| +2700 | $(300 \times 9)$ |  |
| 3114 |  |  |
| 72 |  |  |
| $\begin{array}{r} \\ \times 38 \\ \hline\end{array}$ |  |  |
| 576 (72 $\times 8$ ) |  |  |
| +2160 (72 ${ }^{\text {a }}$ ) |  |  |
| 2736 |  |  |

## Grid method



## Extend to decimals

Decimals with one decimal place $\times U$
$\div=$ signs and missing numbers Continue using a range of equations as in Year 2 but with appropriate numbers

HTU $\div U$
Understand division as sharing and grouping
Understand the operation of division either as sharing equally or as grouping (repeated subtraction). See examples from year 3.

## Short division

Initially, children will continue to use correct place value vocabulary, but as they become more confident, they can be introduced to 'digit-speak'.

See examples in year 4 section, but apply the steps to HTU $\div U$.

## Remainders

Begin to give a quotient as a fraction, when dividing by a whole number.
Begin to give a quotient as a decimal fraction, when dividing by $10,5,4$ or
2.

## YEAR SIX

Children need to understand the concept of equality when using the ' $=$ ' sign.
Calculations should be written either side of the equality sign, so that the sign is not just interpreted as 'the answer'

| ADDITION |
| :--- |
| + = signs and missing numbers |
| Continue using a range of equations as |
| in Y1 and 2 but with appropriate |
| numbers. |
| ThHTU + ThHTU, then any number |
| of digits |
| Using 'carrying' <br> 7648 <br> $+\frac{1486}{9134}$$+\frac{5848}{111}$ |

## Extend to decimals

Using the chosen method, add two or more decimal fractions with up to four digits and either one or two decimal places. Know that decimal points should line up under each other.

- = signs and missing numbers

Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.

## ThHTU - ThHTU, then any number

 of digits
## Decomposition

51316
6467

- 2684

3783

## Extend to decimals

Using the chosen method, subtract two or more decimal fractions with up to three digits and either one or two decimal places. Know that decimal points should line up under each other.
MULTIPLICATION
$x=$ signs and missing numbers
Continue using a range of equations as in Year 2 but with appropriate numbers

## ThHTU $\times U$ and HTU $\times$ TU

## Partitioning

| 4346 | Lead to4346 <br> $\times \quad 8$ <br> 48$(6 \times 8)$ |
| ---: | :--- |
| 320 | $(40 \times 8)$ |
| 2400 | $(300 \times 8)$ |
| $\frac{34768}{234}$ |  |
| $+\quad 32000$ | $(4000 \times 8)$ |
| 34768 |  |


| 352 |
| ---: |
| $\times \quad 27$ |
| 2464 |
| $+\quad(352 \times 7)$ |
| +7040 |
| 9504 |$(352 \times 20)$

Grid method

| $X$ | 4000 | 300 | 40 | 6 |
| :---: | :---: | :---: | :---: | :---: |
| 8 | 32000 | 2400 | 320 | 48 |

$=34768$

| $x$ | 300 | 50 | 2 |
| :---: | :---: | :---: | :---: |
| 20 | 6000 | 1000 | 40 |
| 7 | 2100 | 350 | 14 |

7040
$+2464$
9504
1

## Extend to decimals

Decimals with two decimal places $x U$
$\div=$ signs and missing numbers
Continue using a range of equations as in Year 2 but with appropriate numbers

HTU $\div$ TU
Short division
Use short division supported by jottings.

$$
1 6 \longdiv { 3 8 ^ { 6 4 } 4 }
$$

16 (the first few multiples of 16)
32
48
64

## Remainders

Give a quotient as a fraction when dividing by a whole number.
Give a quotient as a decimal fraction.

## Extend to decimals

Use decimals with up to two decimal places divided by U. Know that decimal points should line up under each other.

