HAND IN HAND WE LOVE, LEARN AND ACHIEVE

THE FOREST FEDERATION

Addition Progression YR to Y6

Addition – progression in written methods Y1 to Y6

$$1 + 5 = 6$$

addend addend sum

Contextualise the mathematics

- **WHAT DOES THIS NUMBER REPRESENT?**

Expose mathematical structure and work systematically

Expect children to use correct terminology and express reasoning

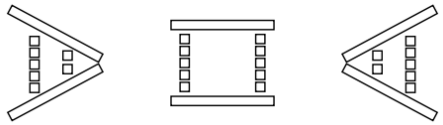
- Use **STEM SENTENCES**
- Answer in **complete sentences**

Identify difficult points

- Be aware of common misconceptions
- Actively seek to uncover these

Move between the concrete, pictorial and the abstract (CPA)

Teach inequality alongside equality



- < and > can also help deepen understanding of key concepts,

Use empty box problems

- Promotes reasoning and finding easy ways to calculate
- Use a sequence to develop conceptual connections

$$6 + \square = 11$$
$$6 + 5 = 5 + \square$$
$$6 + 5 = \square + 4$$

YR Objectives

30-50 months:
Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same.

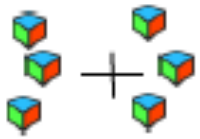
40-60 months:
Finds the total number of items in two groups by counting all of them.
Says the number that is one more than a given number.
Finds one more or one less from a group of up to five objects, then ten objects.
In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting.

In EYFS pupils should be developing their concept of the number system through the use of concrete materials and pictorial representations. They should experience practical calculation opportunities using a wide variety of equipment, e.g. role play, outdoor play, counters, cubes, ten frames etc. They develop ways of recording calculations using pictures, etc.

Pupils must be provided with opportunities to develop their skills so that they are able to count reliably, including one to one correspondence and count on from a given number.
Pupils must be provided with many opportunities to **subitise** numbers so they are equipped to calculate rather than count as they progress through their learning.

Pupils should be given the opportunity to count out sets of objects and then combine them to make a total.

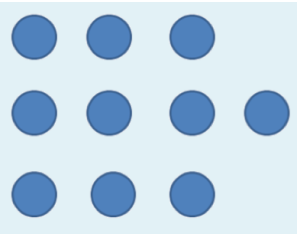
Pupils should recognise different combinations of making single digit numbers. E.g 6 can be made as:

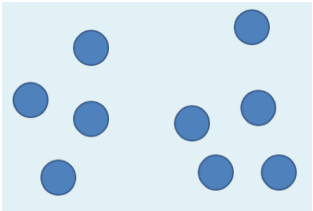


and

is the same as

Subitising
Show the dots for 3 seconds.
How many dots can you see?
How did you see them?
Did you calculate? Eg. 9 + 1 and 4 + 5



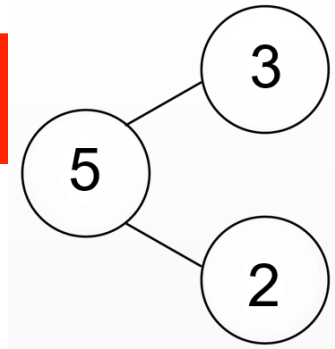


Y1 Objectives

- **Number bonds and related addition facts within 20.**
- **Add 1 and 2 digit numbers to 20, including zero.**

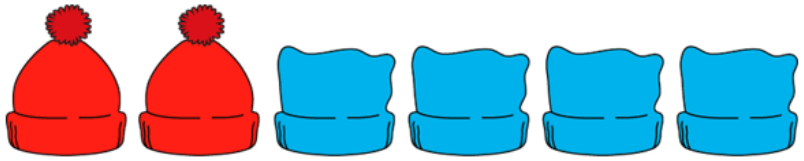
Key skills:
Adding 0 and 1 to a number
Addition bonds within 10 e.g. 5 = 4 + 1
Addition bonds that = 10 e.g. 10 = 6 + 4

Use part whole diagram (include zero)
Zero is not a part



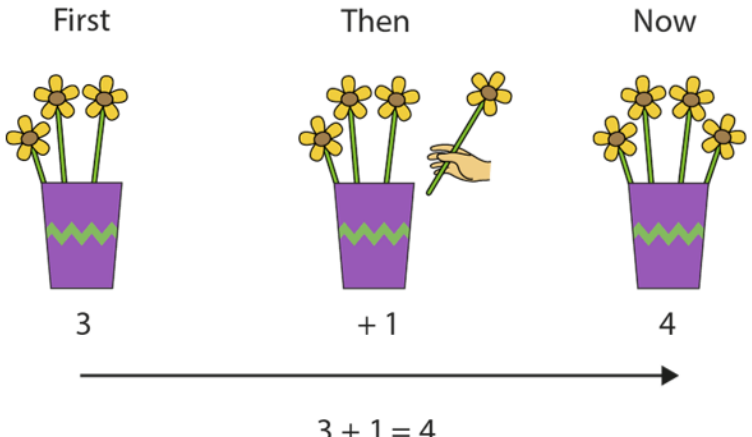
Start with expressions (no = sign)

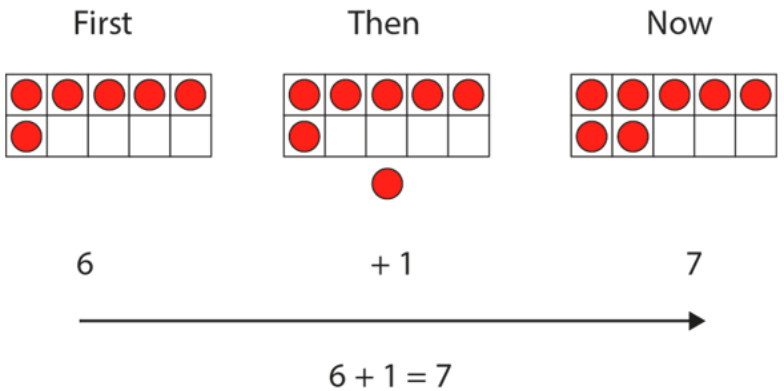
Move on to equations (has = sign)



2 + 4
4 + 2

5 = 3 + 2





Teacher to use the bar model in summer term

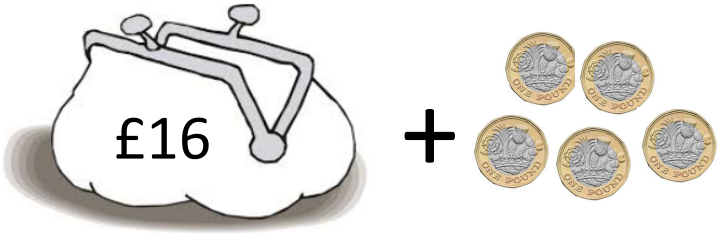
Y2 Objectives

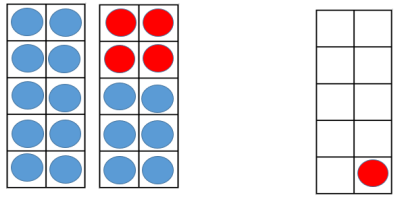
- 1 digit number (dn) + 1dn + 1dn
- 2dn + 1dn
- 2 dn + 2dn (where sum<100)

Key skills:
2dn + 1dn
2dn + multiples of 10

2dn + 1dn Use numbers in a context

What does each number represent?





16 + 5

16 + 4 + 1 = 21

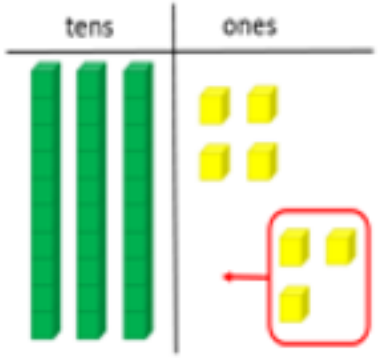
2dn + 1dn Use numbers in a context

At **first** Fiona had saved £34 and **then** she added her £3 pocket money to that.

How much does she have **now**?

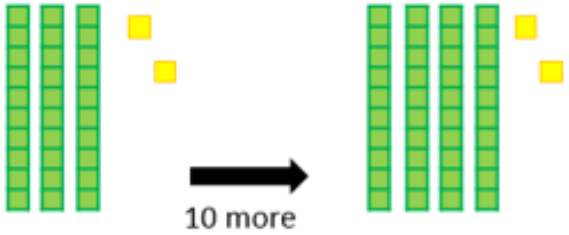
Children to use the bar model

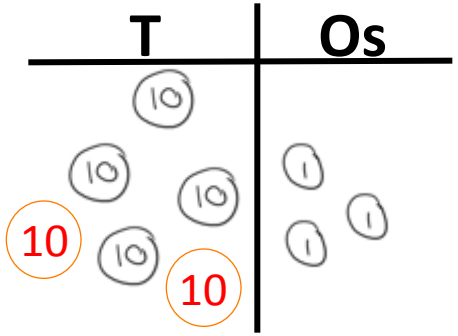
?	
34	3



2dn + multiples of 10

What's the same? What's different?





43 + 20 = 63

2dn + 2dn

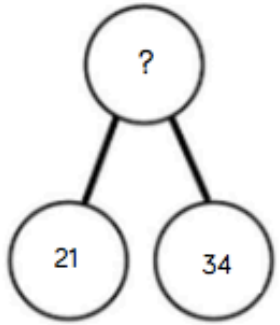
Keep the first number whole

27 + 14

27 + 10 + 4

37 + 4 = 41

Conceptual variation; different ways to ask children to solve 21 + 34



?	
21	34

Word problems:
In year 3, there are 21 children and in year 4, there are 34 children.
How many children in total?

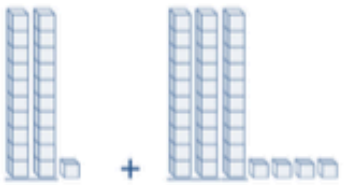
21 + 34 = 55. Prove it

21
+34
___

21 + 34 =

☐ = 21 + 34

Calculate the sum of twenty-one and thirty-four.



Missing digit problems:

10s	1s
10 10	1
10 10 10	?
?	5

It is important to use conceptual variation in order for children to deepen their understanding of the mathematical structure.
Children will find different ways easier or harder to understand than others. We encourage children to work towards looking for the most efficient methods once they have conceptual understanding of the maths.

Y3 Objectives

Mentally:

- **3dn + 1dn**
- **3dn + multiple of ten**
- **3dn + multiple of one hundred**

Written Calculation (using column method) :

- **3dn + 1dn**
- **3dn + 2dn**
- **3dn + 3dn**

Key skills required prior to this stage:

- 2dn + 1dn
- 2dn + multiples of 10
- Column method using concrete and pictorial

Column method

Unitise:

8 ones + 3 ones equals 11 ones. We rename this: it is 1 ten and 1 one.
5 tens add 6 ten add the 1 carried ten equals 12 tens (12 tens = 1 hundred and 2 tens)
3 hundreds add the 1 carried hundred equals 4 hundreds

3dn + 2dn with renaming
Exchanged figure at the bottom

3dn + 3dn with renaming
Exchanged figure at the bottom

Solve missing box problems

Mental strategies based on experience using concrete and pictorial representations previously:

143 + 9 = 143 + 7 + 2 = 150 + 2 = 152

276 + 35 = 276 + 30 + 5
= 306 + 5
= 310 + 1 = 311

165 + 305 = 305 + 165
= 305 + 100 + 60 + 5
= 405 + 60 +5 = 465 + 5 = 470

$$\begin{array}{r} 358 \\ +\ \ 63 \\ \hline 421 \\ \hline \end{array}$$

+1 +1

$$\begin{array}{r} 258 \\ +\ 165 \\ \hline 423 \\ \hline \end{array}$$

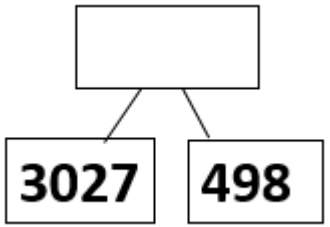
+1 +1

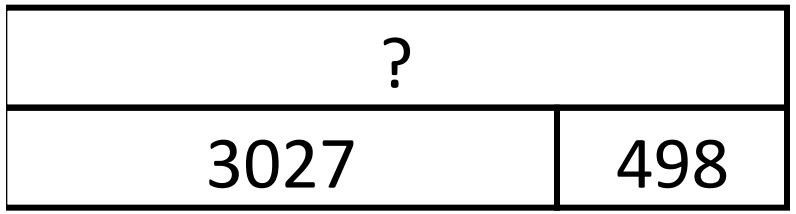
$$\begin{array}{r} 58 \\ +\ 1\square \\ \hline 75 \\ \hline \end{array}$$

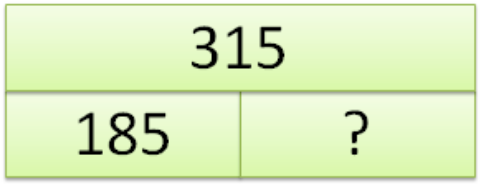
Y4 Objectives

- Numbers up to 4 digits
- Estimate and use inverse operations
- Solve two step addition problems, choosing the appropriate method

Children to use the part whole and bar model to develop estimation and number sense







315 – 185 = ?

185 + ? = 315

Prior Key skills:
2dn + 1dn
2dn + multiples of 10
Column method

Y3: 3dn + 3dn with renaming
Exchanged figure at the bottom

$$\begin{array}{r} 258 \\ +\ 165 \\ \hline 423 \\ \hline \end{array}$$

+1 +1

4dn + 4dn with renaming
Exchanged figure at the bottom

$$\begin{array}{r} 7289 \\ +\ 5145 \\ \hline 12434 \\ \hline \end{array}$$

+1 +1+1

Solve missing box problems

$$\begin{array}{r} 7\ 5\ 8 \\ +\ \square\ 1\ 5 \\ \hline 1\ 0\ \square\ 3 \\ \hline \end{array}$$

Y5 Objectives

- Numbers with more than 4 digits
- Add mentally with increasingly larger numbers
- Use rounding to check
- Solve multi-step problems, choosing appropriate method
- Decimal numbers

Children to use the part whole and bar model to develop estimation and number sense

?	
375.5	14.3

Problem solving

Amy and Matthew are playing their favourite computer game. Amy's current high score is 8,524.
Matthew's high score is bigger than Amy's and when you add them together their combined total is19,384.
What is Matthew's high score?

Decimal numbers
Different number of digits

```
  57.30
+  6.08
  63.38
  +1
```

- **Vary the number of digits in the number**
- **Write = sign in different positions**
- **Balanced equations**

65 + 577 =

? = 4277 + 656

648 + ? = 1036 + 58

Work out the missing numbers.

```
  □4□3□
+ 2□5□2
  78529
```

Y6 Objectives

- **Numbers with more than 4 digits**
- **Decimal numbers**
- **Multi-step problems**

Children to use the part whole and bar model to develop estimation and number sense

?	
487.3	2.9

- **Vary the number of digits in the number**
- **Write = sign in different positions**
- **Balanced equations**

247 + 14,699 =

? = 6.9 + 14.32

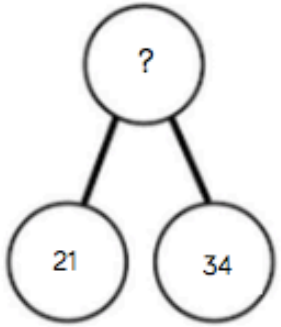
$\frac{2}{5} + \frac{1}{4} + \frac{1}{2} =$

Problem solving

A is an odd number which rounds to 100,000 to the nearest ten thousand.
It has a digit total of 30.
B is an even number which rounds to 500,000 to the nearest hundred thousand.
It has a digit total of 10.
A and B are both multiples of 5 but end in different digits.

A	B
631,255	

Conceptual variation; different ways to ask children to solve 21 + 34



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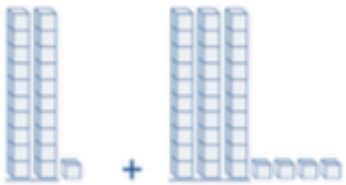

Missing digit problems:

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10 10	1
10 10 10	?
?	5