We transform

CALCULATION POLICY

The Skinner Street Way

ETHOS AND VISION

At Oasis Academy Skinner Street we believe that it is every pupil's entitlement to an outstanding education. We expect all our teachers to strive to be outstanding.

We are committed to the Oasis Charter and the values and beliefs expressed, its ethos and outcomes:

- We are motivated by the life, message and example of Jesus Christ
- Learning, achievement, personal fulfilment and good citizenship are at the heart of all that we do
- We serve our children, young people, families and local communities with love, optimism, enthusiasm and integrity.

At Oasis Academy Skinner Street we aspire to the following in all our educational work:

- That every person matters and we value everyone
- We have a passion for learning and we want everyone to achieve their full, god-given potential
- We are committed to community development and will help to increase community cohesion, locally, nationally and globally.

Introduction

Whilst working through the stages in calculation it is important to provide opportunities to rehearse and develop mental calculations strategies.

Key mental calculation strategies include:

From Year R:

- Partition and recombine
- Doubles and near doubles
- Use number pairs to 10 and 100
- Counting on

From Year 1

- Adding near multiples of ten and adjusting
- Using patterns of similar calculations
- Using known number facts

- Bridging though ten, hundred, tenth
- Use relationships between operations

From Year 3

- x4 by doubling and doubling again
- x5 by x10 and halving
- x20 by x10 and doubling

Stages in counting

All children go through these stages in counting. Generally, they should be secure with them by the end of Year R.

1. Stable order (knowing numbers come in an order)
2. One to one correspondence (touching and counting)
3. Cardinal (knowing last number is the total)
4. Abstraction (being able to count without seeing/touching items)
5. Order irrelevance (doesn't matter how you count the total will be the same)

Place value

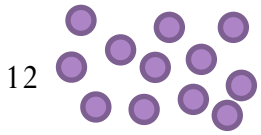
The children need to be able to partition numbers in different ways to help understanding and also mental calculation:

- Partition all pairs of numbers for all numbers to 20, e.g. 1 + 4 = 5, 2 + 3 = 5, 3 + 2 = 5
- Partition 2-, 3- etc. digit numbers in different ways, e.g. 57: 50 + 7, 40 + 17, 30 + 27, 20 + 17, 10 + 7

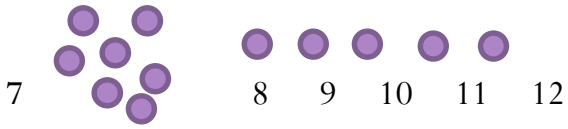
Stages in addition

Aggregation (counting all)

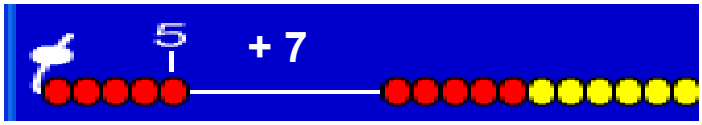
5 7

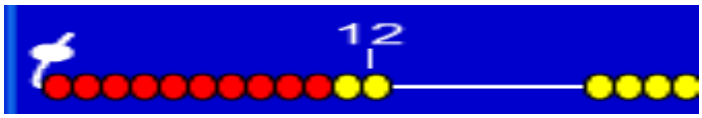


Augmentation (adding on to a set)

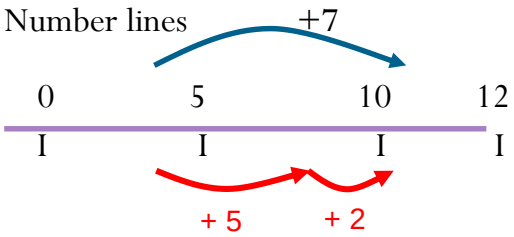


Bead strings





Number lines



Partitioning

48 + 33

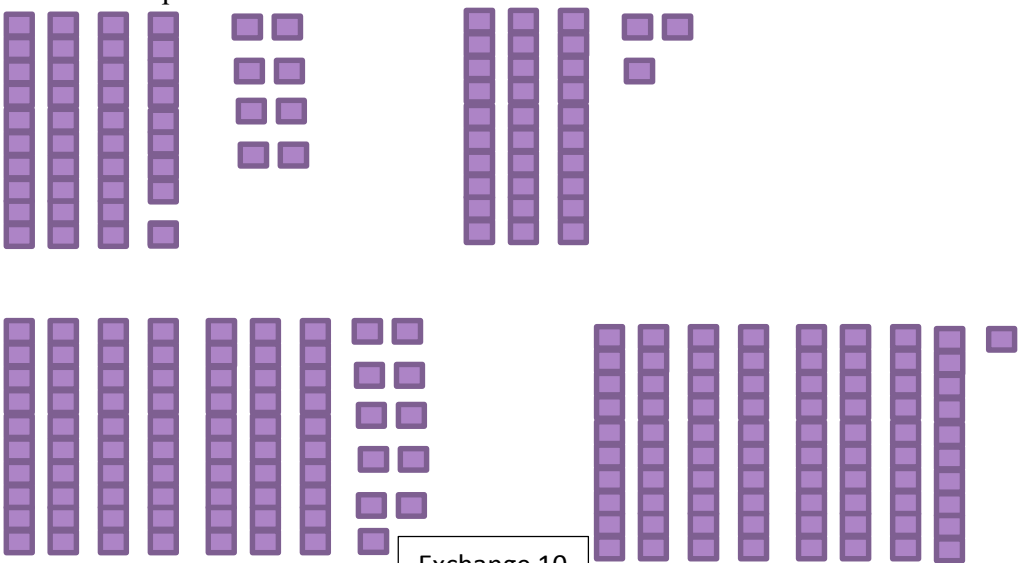
40 8 30 3 = 70+11= 81

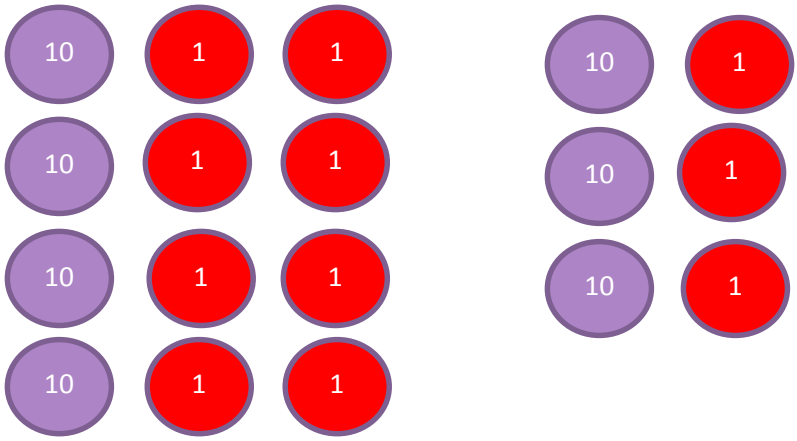
48
+ 33
70
11

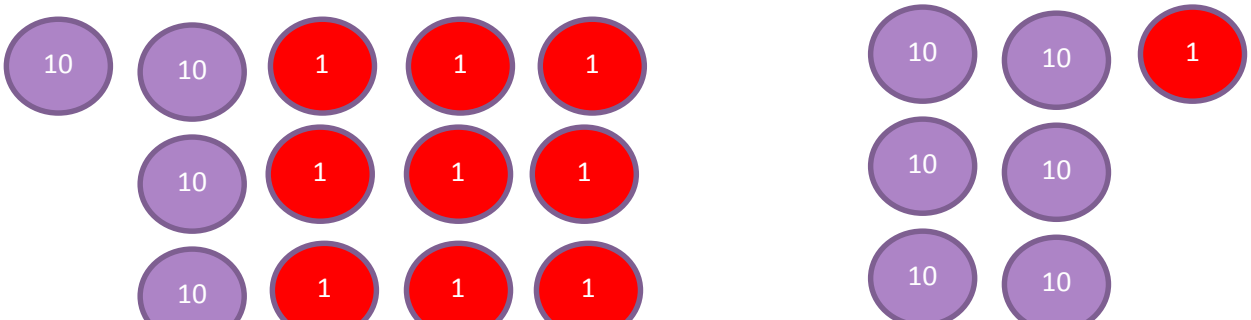
Sequencing

48 + 30 + 3 = 78 +3 = 81

Use of manipulatives to lead to short method:







Exchange 10 ones for a ten

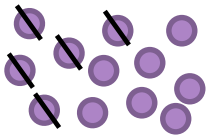
Short method

$$\begin{array}{r} 248 \\ +\,139 \\ \hline 387 \\ \hline {\scriptstyle 1} \end{array}$$

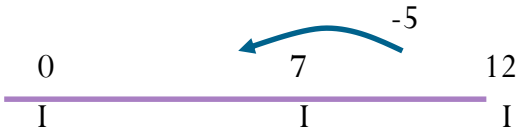
Stages in subtraction

Removing items from a set (reduction or take-away)

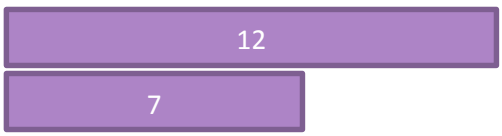
$12 - 5 = 7$

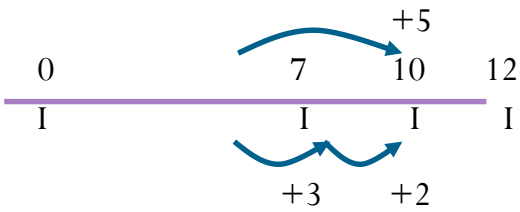


Counting back along a number line



Finding the difference on a number line





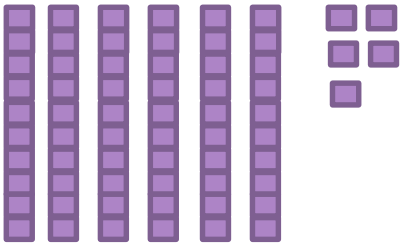
Sequencing

56 – 24

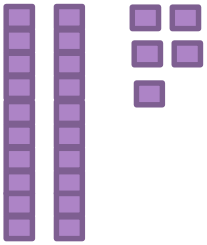
56 – 20 – 4 = 36 – 4 = 32

Use of manipulatives to lead to short method:

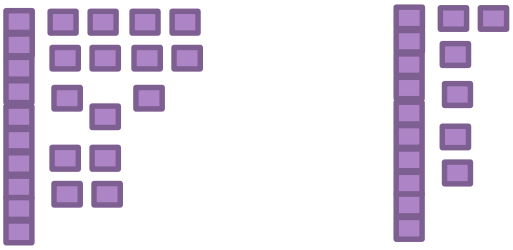
65 – 49



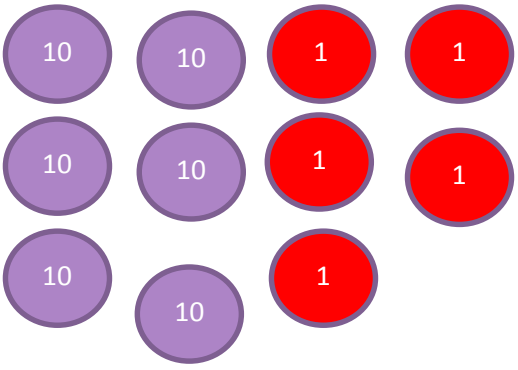
Take away 40



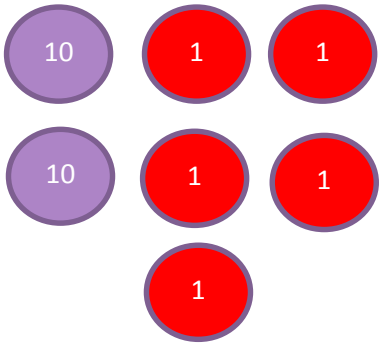
Take away 9



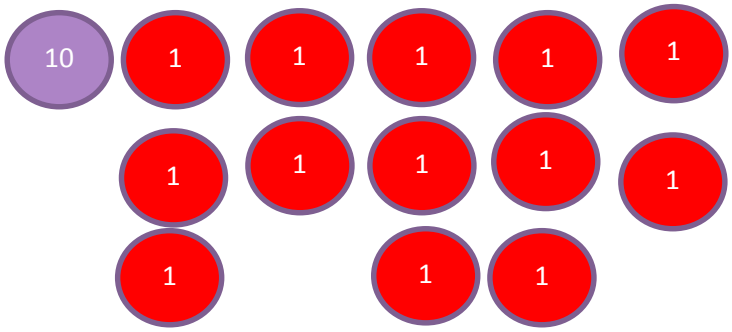
65 – 49



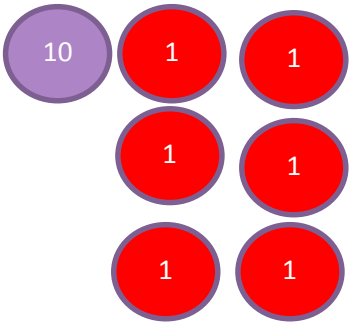
Take away 40



Exchange one ten for 10 ones



Take away 9



Partitioning and re-partitioning to lead to short method

294 – 178

	200	90	4		200	80	14
-	100	70	8	-	100	70	8
	100	20	-4		100	10	6

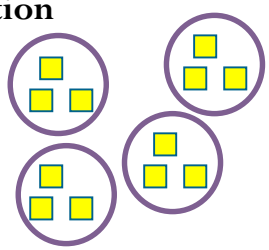
100 + 20 – 4 = 116 100 + 10 + 6 = 116

Short method

$$\begin{array}{r} 2\,\overset{8}{\cancel{9}}\,{}^{1}4 \\ -\ 1\ 7\ 8 \\ \hline 1\ 1\ 6 \end{array}$$

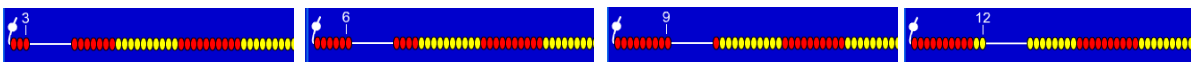
Stages in multiplication

Lots of the same thing



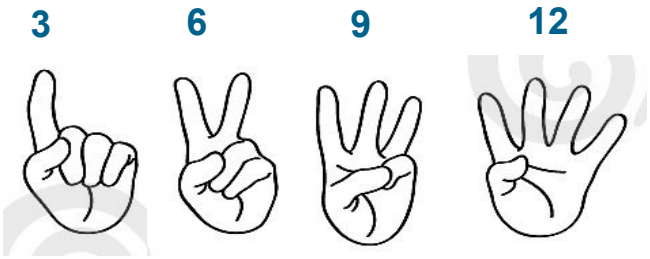
3 x 4

Bead strings

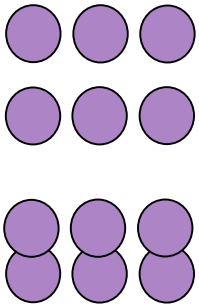


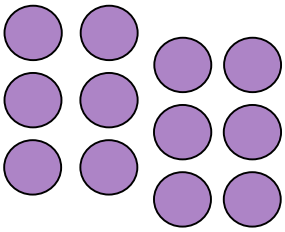
Number lines

Fingers



Arrays

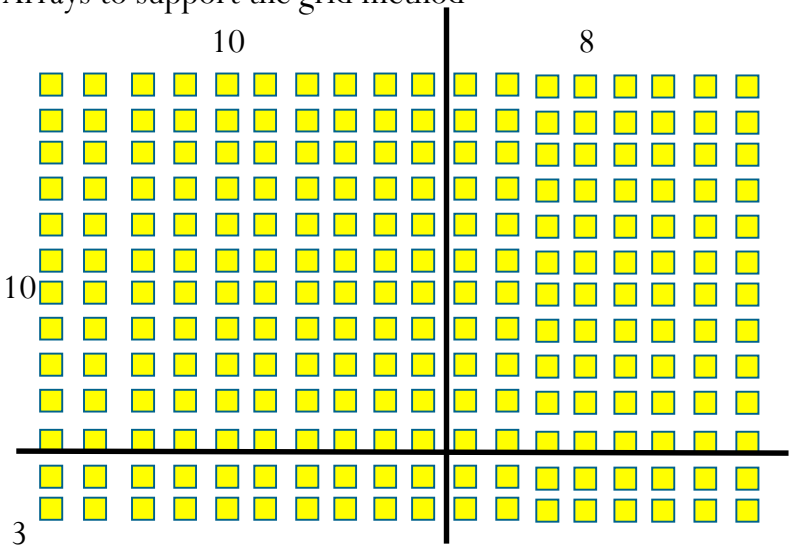




3 x 4

4 x 3

Arrays to support the grid method



Use place value counters to demonstrate this

	10	8
10	100	80180
3	30	24 54

Total: 234

Leading to:

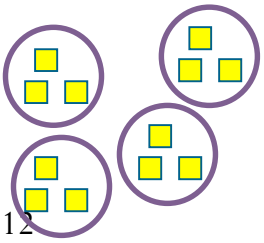
```
  18
x 13
  54
 180
234
```

or...

18	18	180
x 10	x 3	+ 54
180	54	203

Stages in division

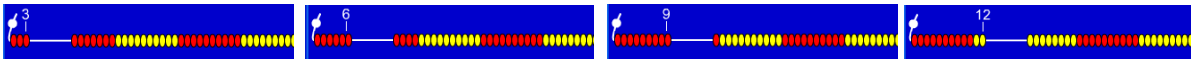
Lots of the same thing



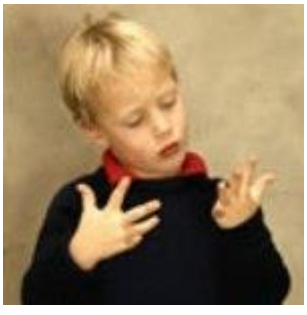
12 ÷ 3

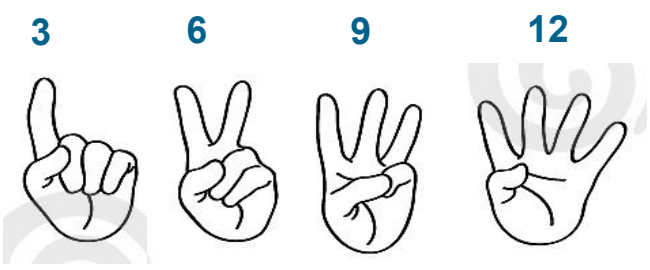
How many groups of 3 in 12

Bead strings



Fingers





Number lines (counting up in 3s)

Counting in larger multiples:

122 ÷ 3

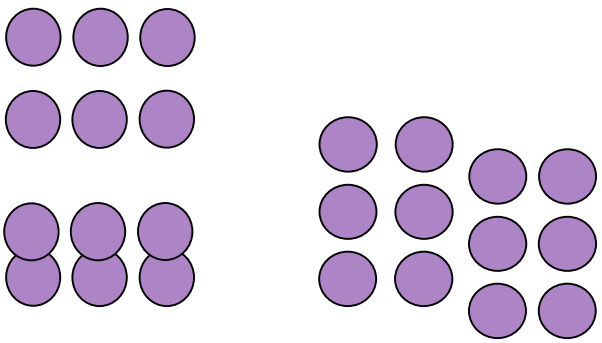
Vertical grouping:

122 ÷ 3
- 120 (3 x 40)
2

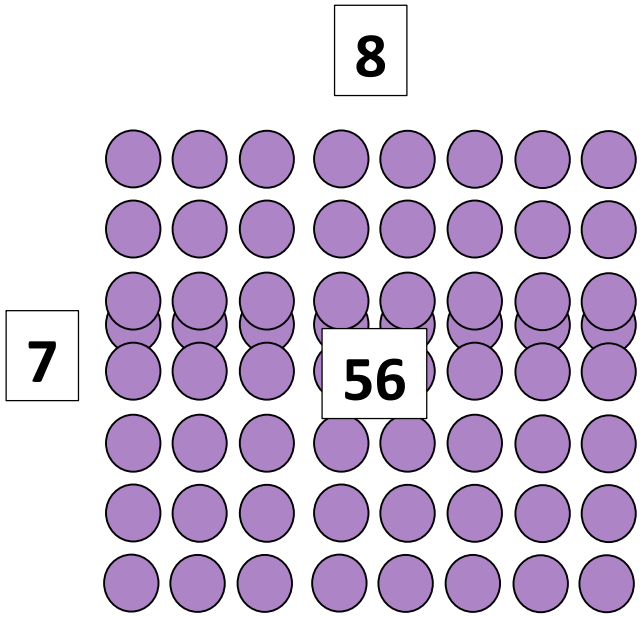
Partitioning:

120 + 2
40 remainder 2 out of a group of 3 or 2/3

Arrays



12 ÷ 3 12 ÷ 4

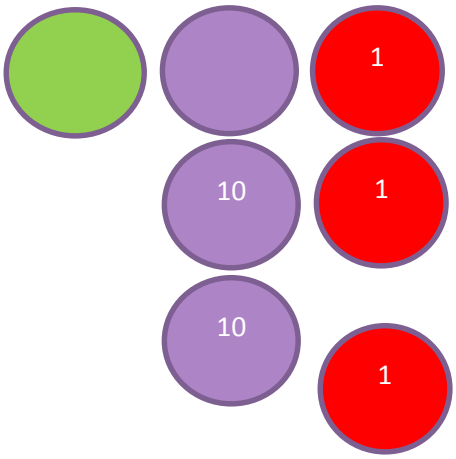


Leading to:

$$7\overline{)56}\quad 8$$

133 ÷ 6

Important to let the children use manipulatives such as place value counters to explore exchange:

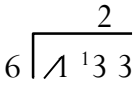


You cannot take 6 groups of 100 away from the one 100

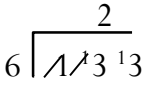
Exchange the 100 for 10 tens so you have 13 tens

$$6\overline{)1\,^{1}3\;3}$$

You can now take two groups of 6 tens



One groups of ten will be left. This is exchanged for 10 ones. You now have 13 ones.



You can take another two groups of 6 ones from the 13 leaving a remainder of 1