Addition and Subtraction

Year 2

Maths at Templemoor

- The national curriculum sets out the expectations for what is taught all schools nationally.
- We use a scheme called ‘The White Rose’ .
- Maths is taught daily.
- Maths lessons are practical, fun and varied.
- Maths has a real purpose and is used in everyday situations.

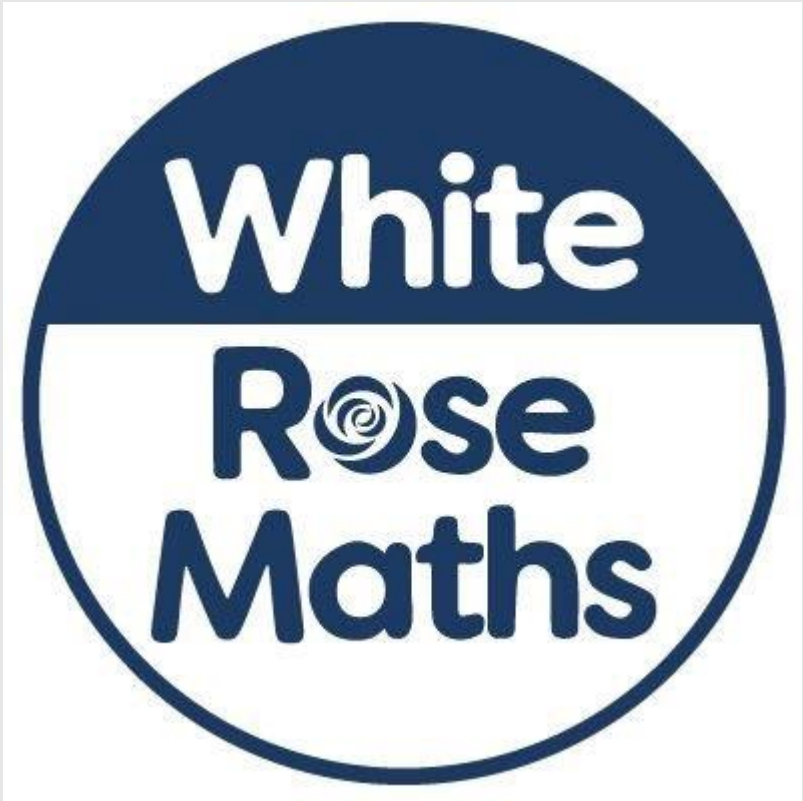
National Curriculum 2015

- Aims
- The national curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.


White
Rose
Maths

EVERYONE CAN DO MATHS: EVERYONE CAN!

- ‘Together, we’re building a whole new culture of deep understanding, confidence and competence in maths – a culture that produces strong, secure learning and real progress.’

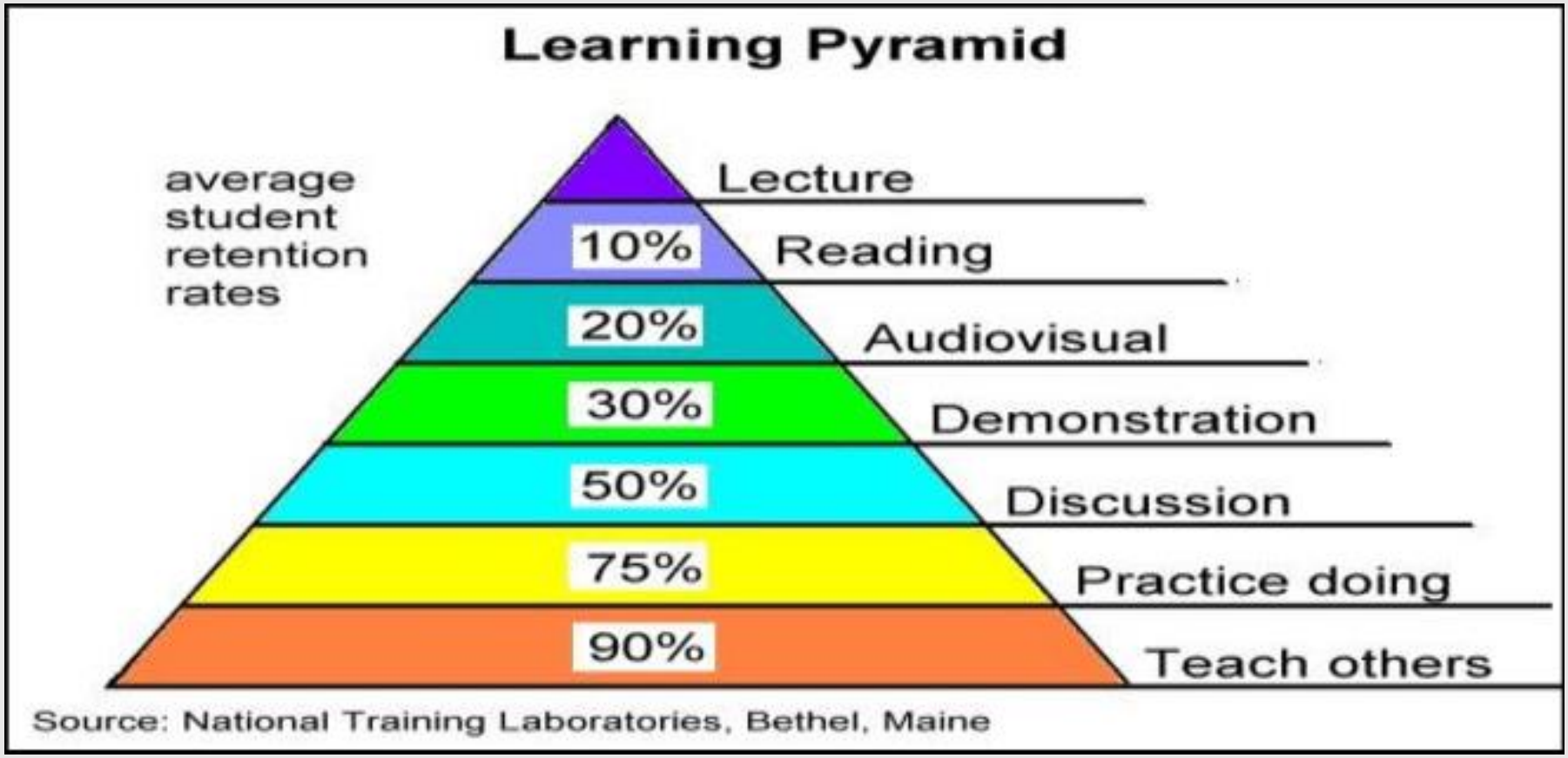
National Curriculum: Number and place value

- count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
- recognise the place value of each digit in a two-digit number (tens, ones)
- identify, represent and estimate numbers using different representations, including the number line
- compare and order numbers from 0 up to 100; use <, > and = signs
- read and write numbers to at least 100 in numerals and in words
- use place value and number facts to solve problems.

National Curriculum: Addition and Subtraction

- **solve problems with addition and subtraction**: using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- **applying** their increasing **knowledge of mental and written methods**
- **recall** and use addition and subtraction **facts to 20 fluently**, and derive and use **related facts up to 100**
- add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
  - a **two-digit number and ones**
  - a **two-digit number and tens**
  - **two two-digit numbers**
  - **adding three one-digit numbers**
- show that **addition** of two numbers **can be done in any order** (commutative) and **subtraction** of one number from another **cannot**
- recognise and use the **inverse relationship** between addition and subtraction and use this to check calculations and solve missing number problems.

How children learn



CPA

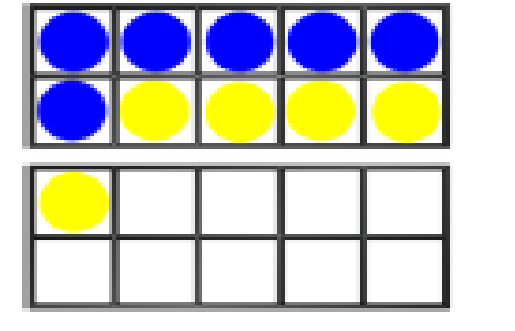
Concrete: real objects or counting equipment.

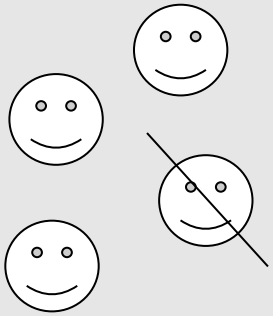
Pictorial: images to aid understanding

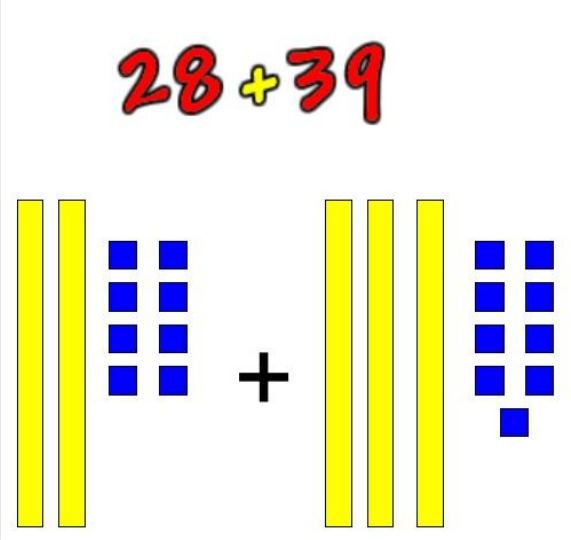
Abstract: numerals and symbols

Concrete:
real objects and maths resources

Pictorial







Abstract

12 + 17 =

56 – 34 =

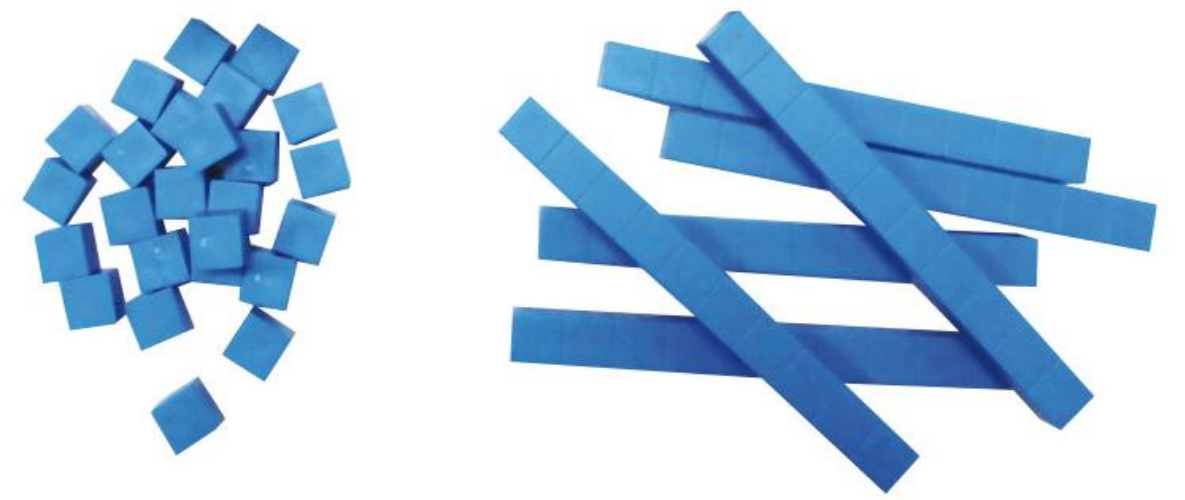
70 + ? = 100

50 = 20 + ?

Resources and models

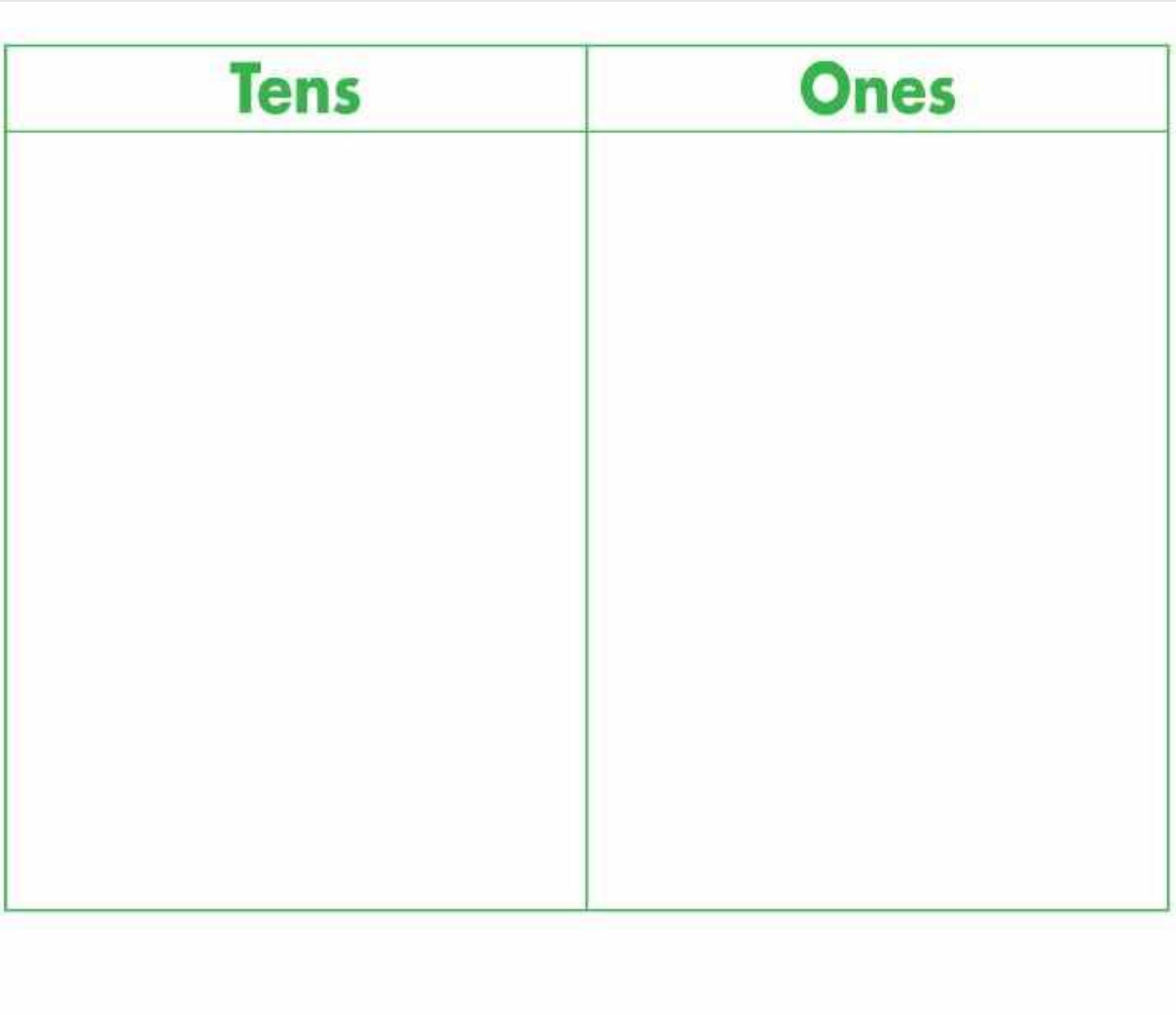
Throughout school we use a variety of models and resources that support the children to visually conceptualise when they are solving calculations.

Dienes

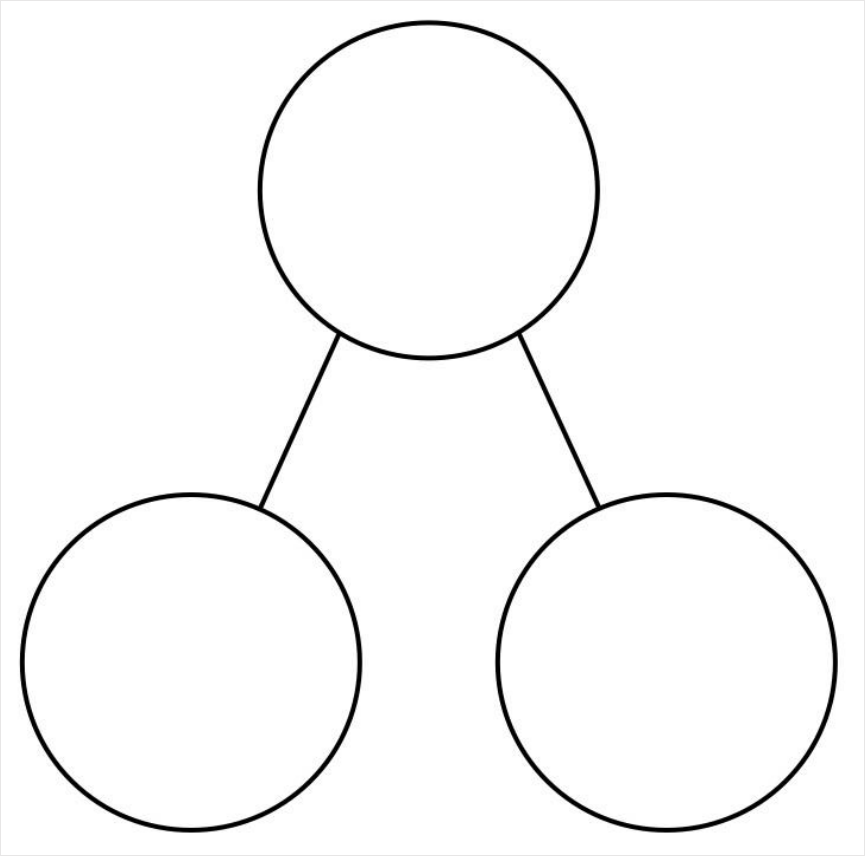


Numicon

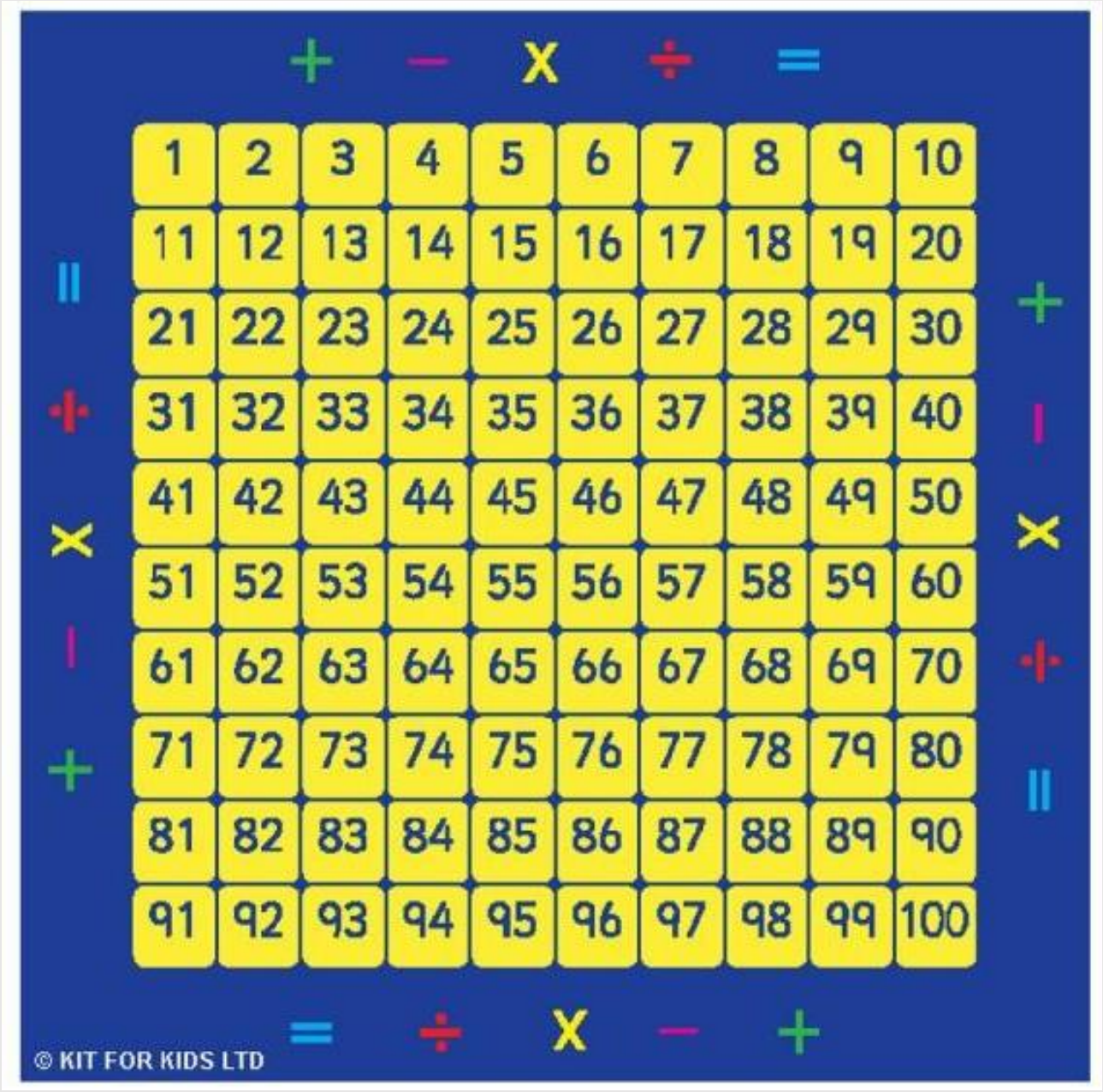
Tens and ones frames



Part, part whole model



www.topmarks.co.uk/learning-to-count/paint-the-squares



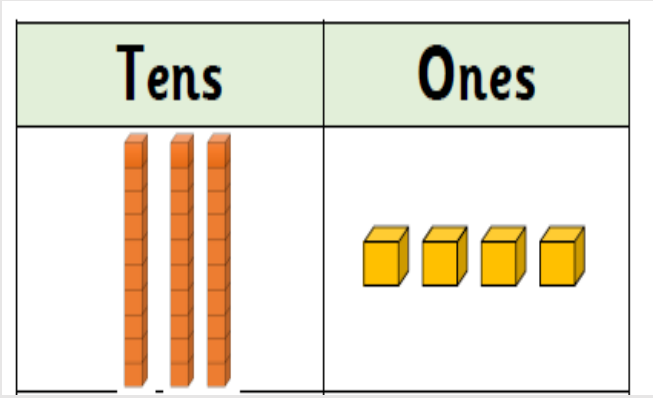
Place value

To recognise the place value of each digit in a two-digit number (tens, ones)

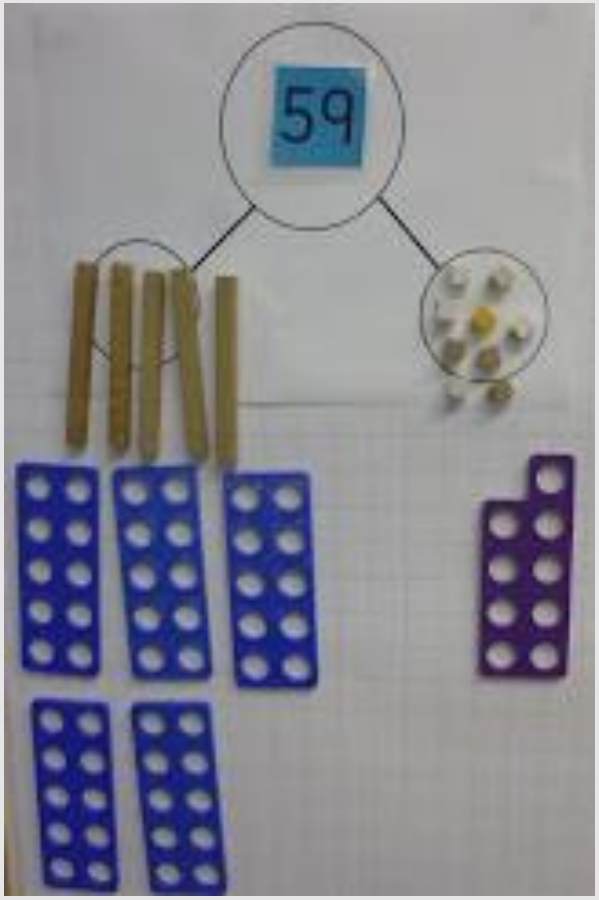
Place Value

- In order to efficiently add or subtract two digit numbers together children need a secure understanding of place value.
- This means that in a two-digit number they understand that the first digit represents how many tens there are in the number and that the second one represents how many ones there are.

34 is 3 tens and 4 ones



We use a variety of resources to show the representation of tens and ones.

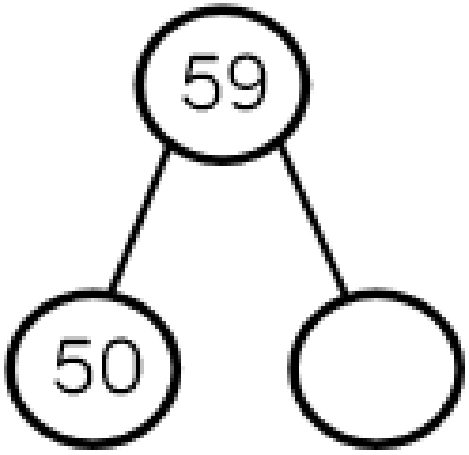


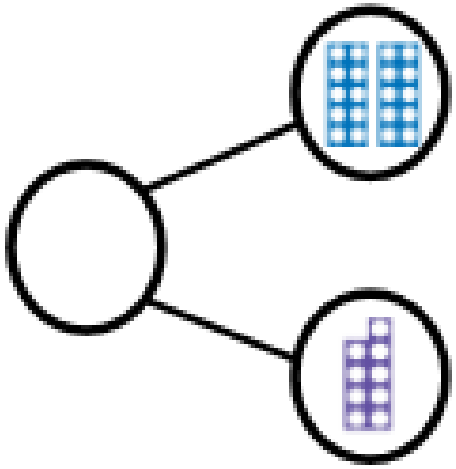
59 = 5 tens and 9 ones

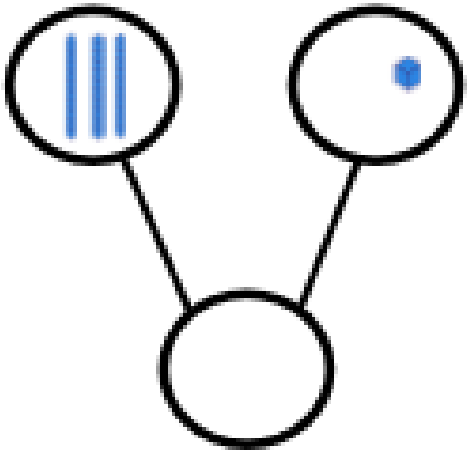
59 = 50 + 9

Problem solving

Complete the part whole models.







Problem solving

Each bag contains 10 cookies.

How many cookies are there altogether?

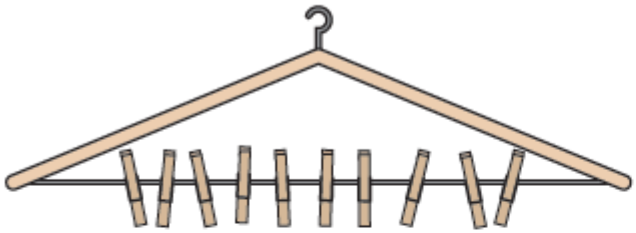
Write your answers in numerals and words.

What strategy did you use?

Did your partner use a different method?

Problem solving

If each peg on the coat hanger has a value of 10, find three ways to partition the pegs to make the number sentences complete.



□ + □ + □ = □

□ + □ + □ = □

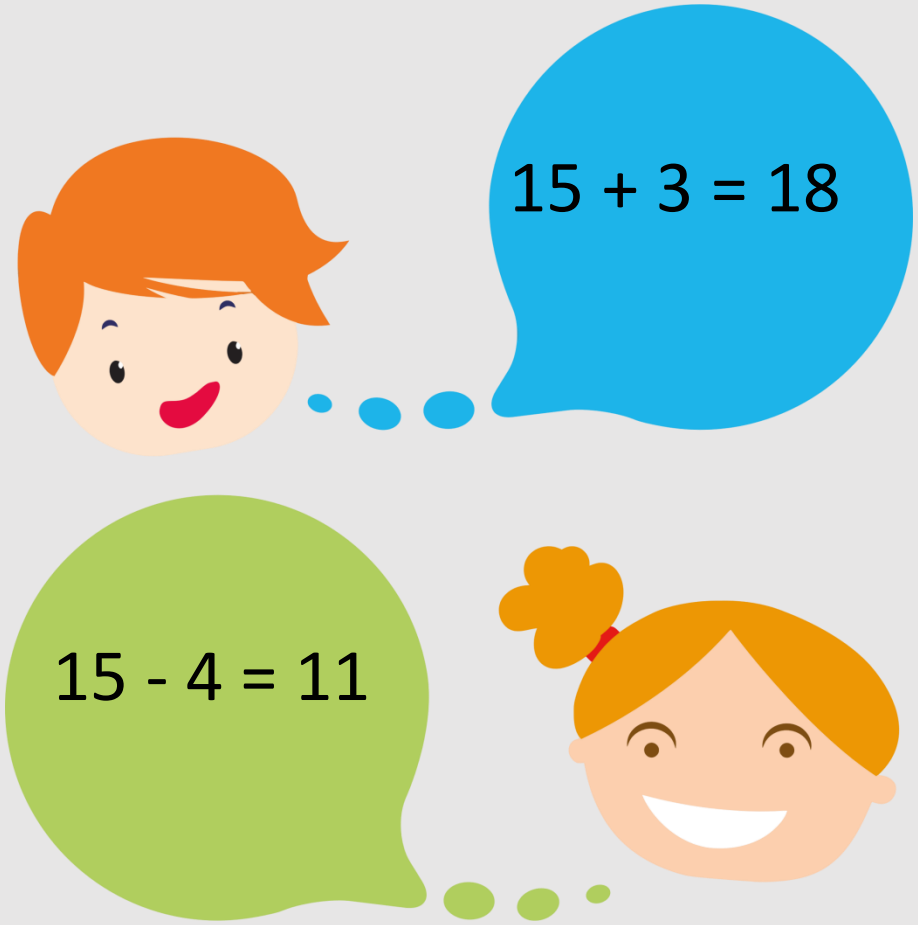
□ + □ + □ = □

What is the total of each addition sentence?

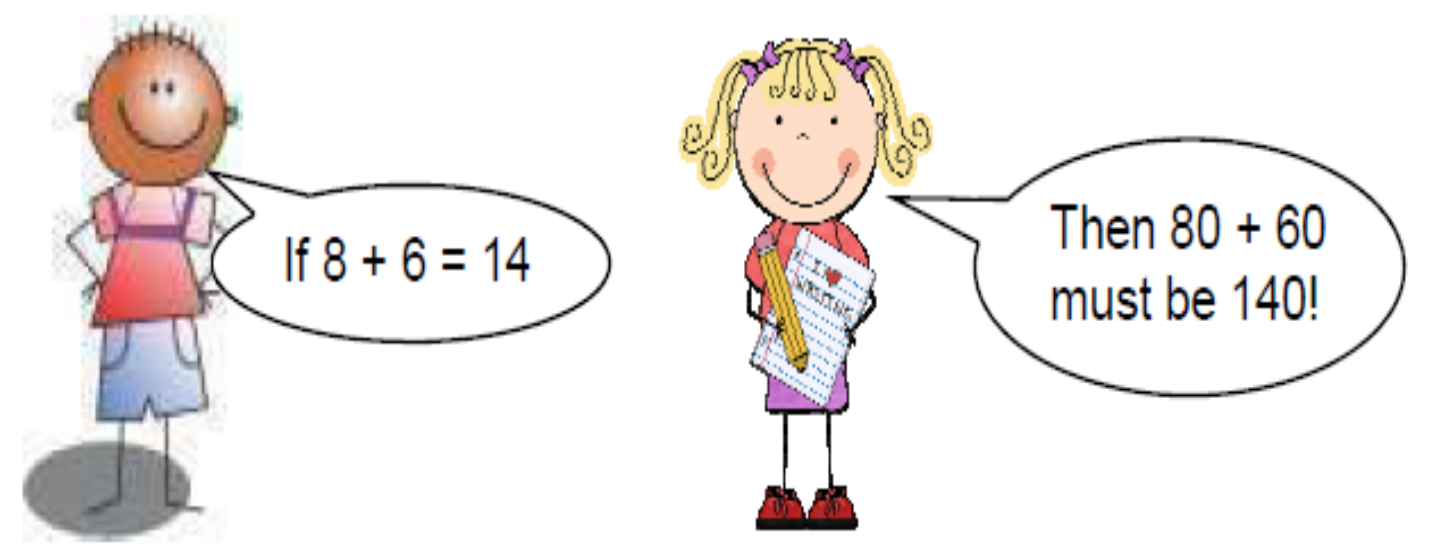
Will the total always be the same?

Explain your reasoning.

Rapid recall of number facts to 20



Use addition and subtraction number facts within 20 fluently and derive related facts to 100.



If I know that 10 – 4 = 6

I know that 100 - ? = 60

Addition and subtraction are **inverse** calculations.

If you know one fact you know 3 more!

16 + 3 = 19

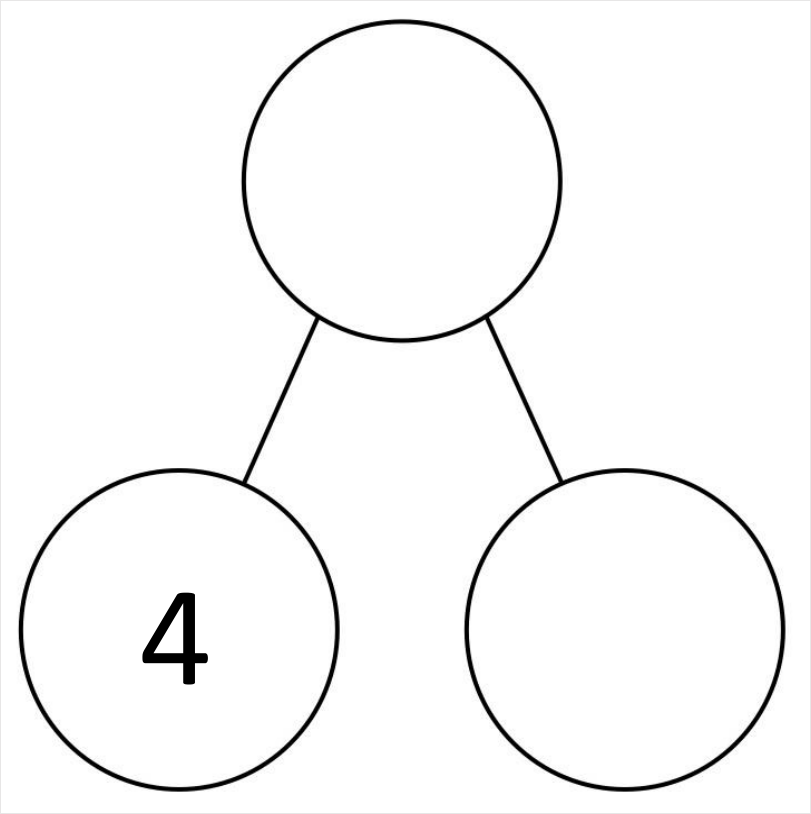
3 + 16 = 19

19 – 3 = 16

19 – 16 = 3

Problem solving

Here is an incomplete part, part whole model. If the total is greater than 10 but less than 20 what could the numbers be?



Problem solving

I think of a number and add 7

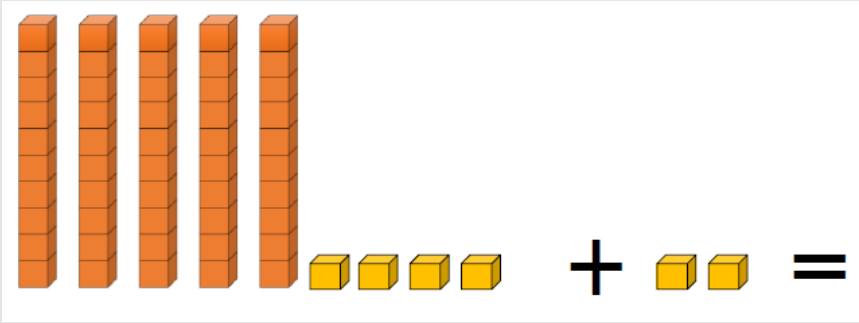
I get 18

What was my number?

Adding and subtracting a two-digit number and a one-digit number.

Adding and subtracting a two-digit number and a one-digit number.

Children may start with concrete resources and count on to find the answer.

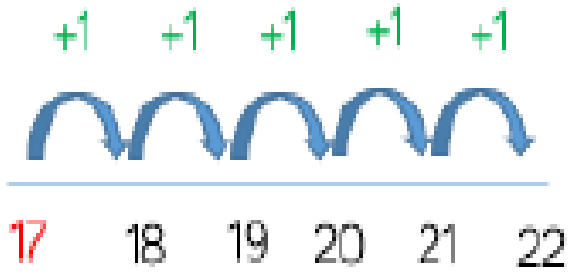


54 + 2 =

Adding and subtracting a two-digit number and a one-digit number.

Counting on to find the answer.

$17 + 5 =$

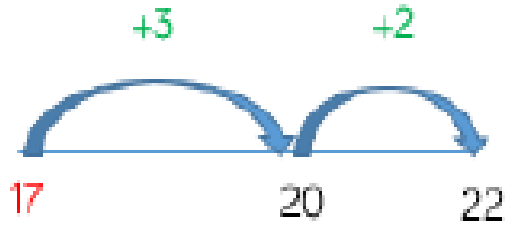


Can you put the larger number in your head and count on the smaller number? Start at 17 and count on 5

Addition and subtraction a two-digit number and a one-digit number.

As the children become secure in knowing the number facts to 10 and 20 they can use this knowledge to bridge up to the next 10.

Can we use number bonds to solve the addition more efficiently?



We can partition 5 into 3 and 2 and use this to bridge the 10

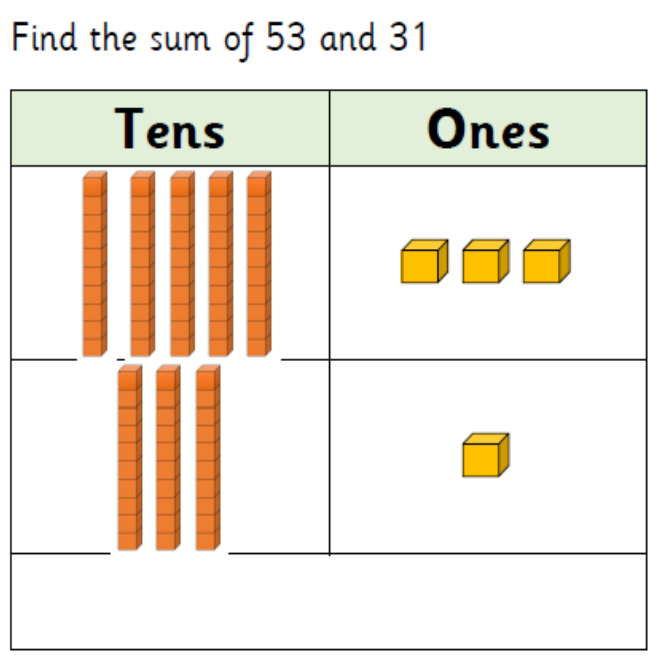
Adding and subtracting two two-digit numbers

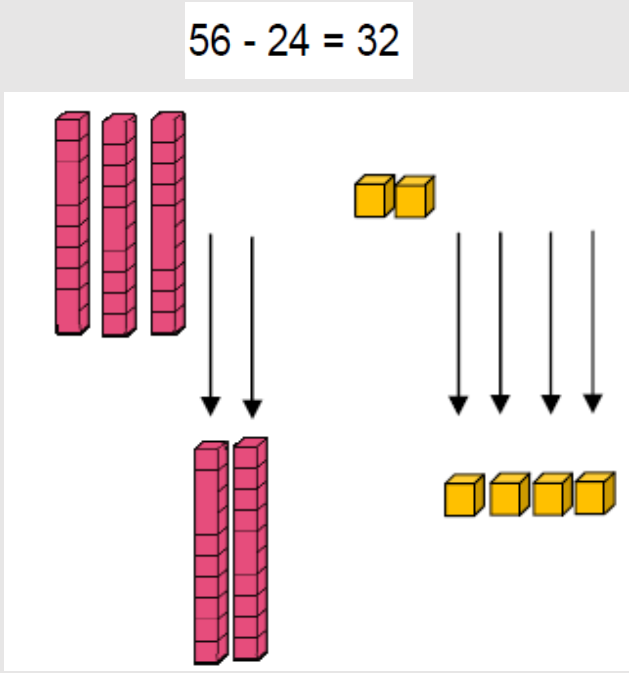
56 + 31 =

78 – 42 =

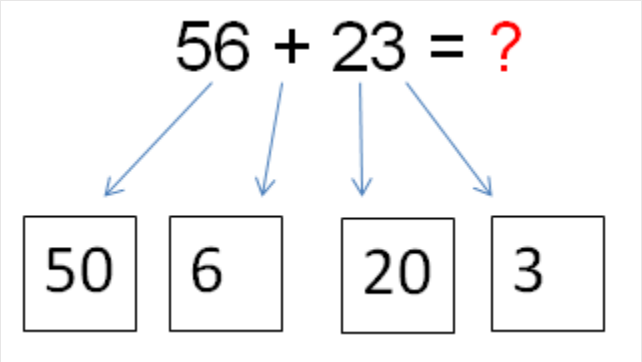
Adding two two-digit numbers, without an exchange.

- Children can use their understanding of place value to add two-digit numbers together. Base 10 resources are used alongside, pictorial images and abstract numbers and symbols.
- Initially adding numbers which **do not cross ten**.





Partitioning the tens and ones
Add the ones first and then the ten
Add both totals

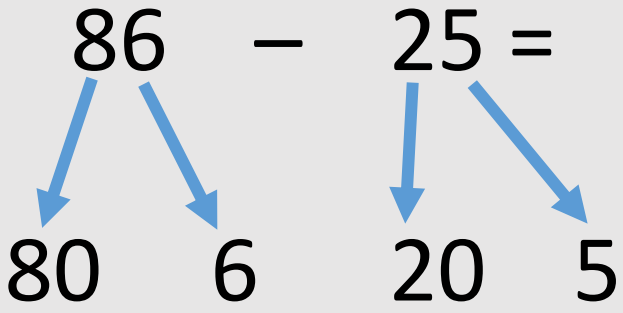


6 + 3 = 9

50 + 20 = 70

70 + 9 = 79

Partition the numbers into tens and ones
Subtract ones first and then the tens
Add both totals

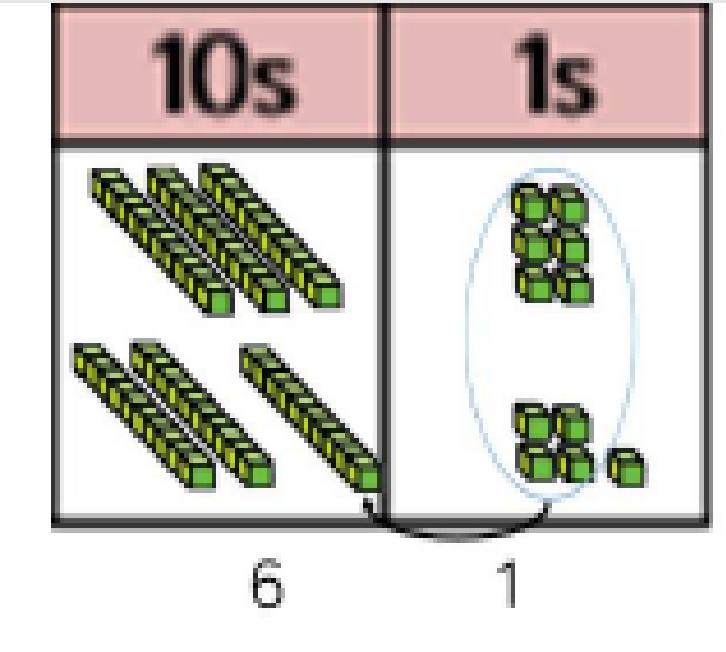


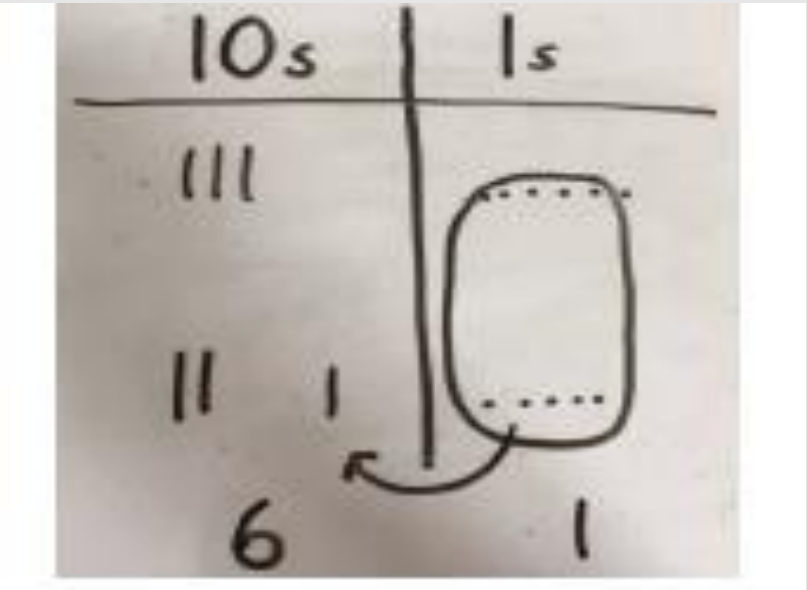
6 – 5 = 1

80 – 20 = 60

60 + 1 = 61

Adding and subtracting two two-digit numbers, with an exchange.

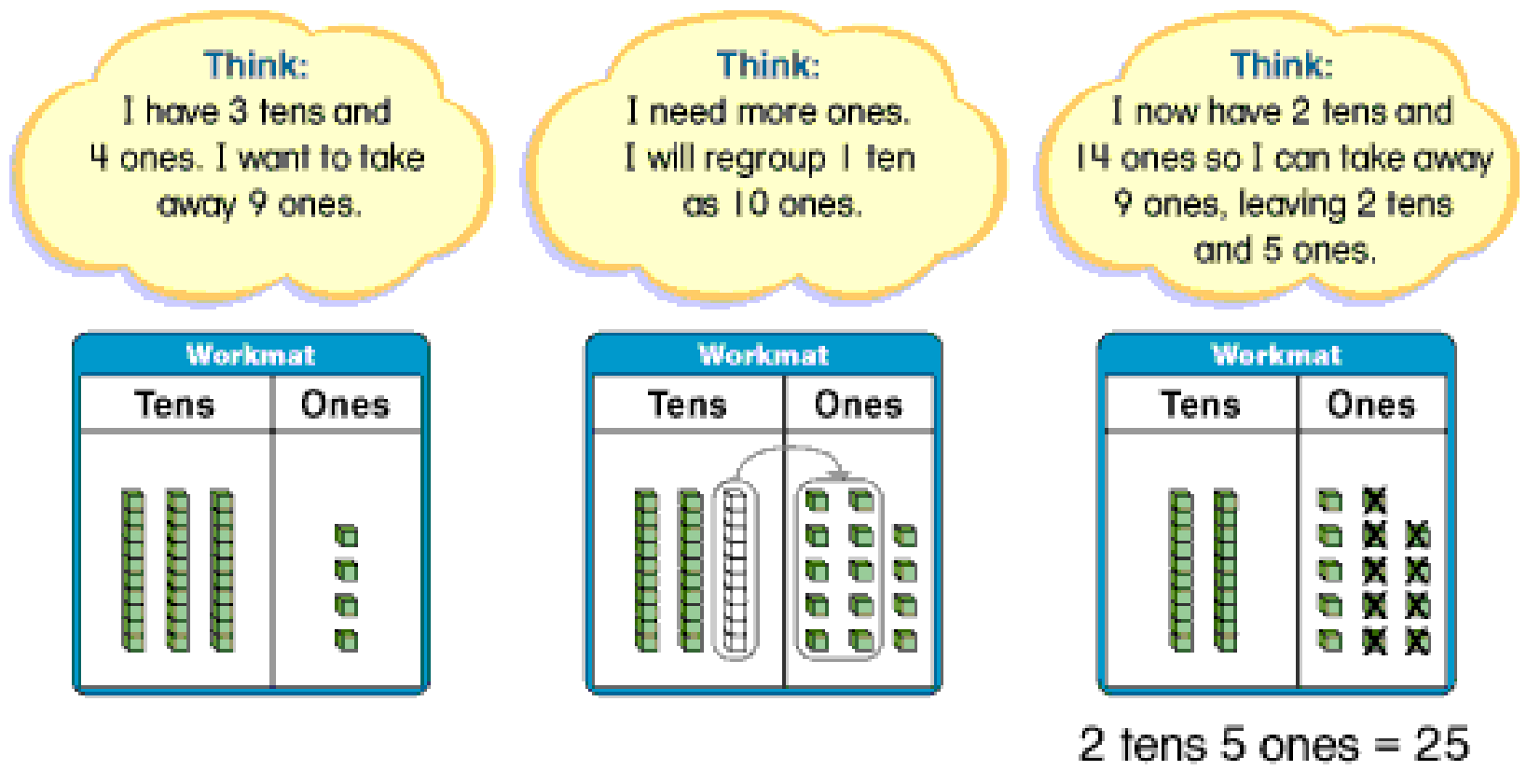




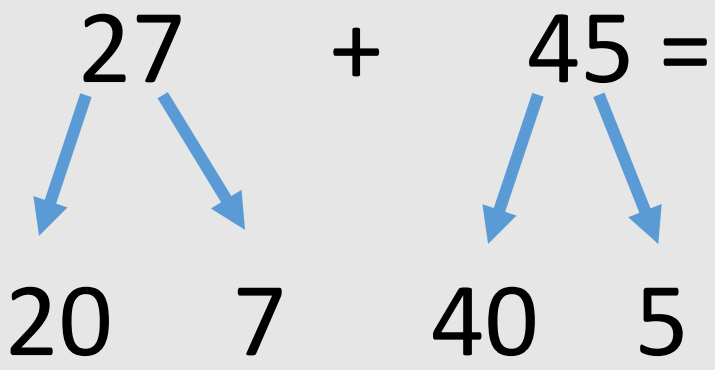
36 + 25= 61

Adding and **subtracting** two digit numbers, with an exchange.

34 – 9 =



Partition the number
Add the ones and then the tens
Add both totals



7 + 5 = 12

20 + 40 = 60

60 + 12 = 72

Adding and **subtracting** two digit numbers, with an exchange.

52 – 34 =

40 12 30 4

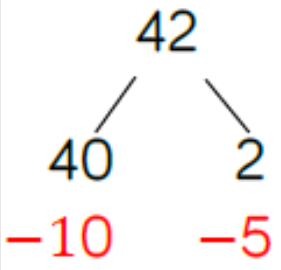
12 – 4 = 8

40 – 30 = 10

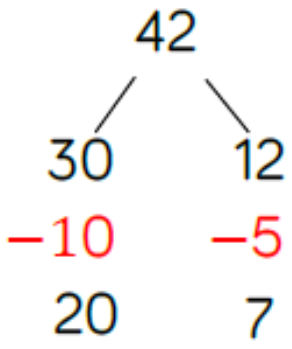
10 + 8 = 18

Partitioning differently to make the calculation easier.

$42 - 15 =$



We can't subtract the ones. Can we partition differently?

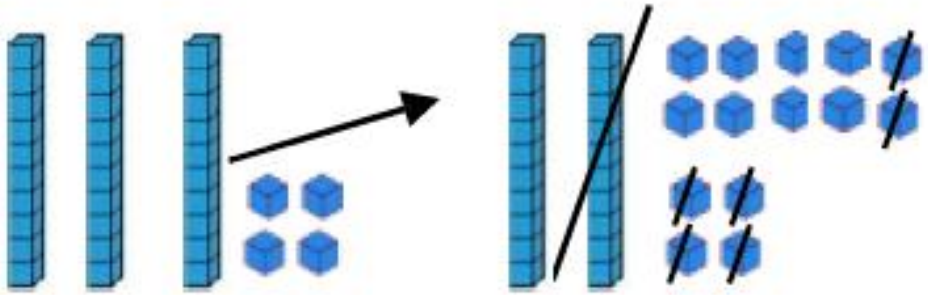


Now we can subtract the ones and then subtract the tens.

$42 - 15 = 27$

Showing the vertical written method once the child has a secure understanding of exchange.

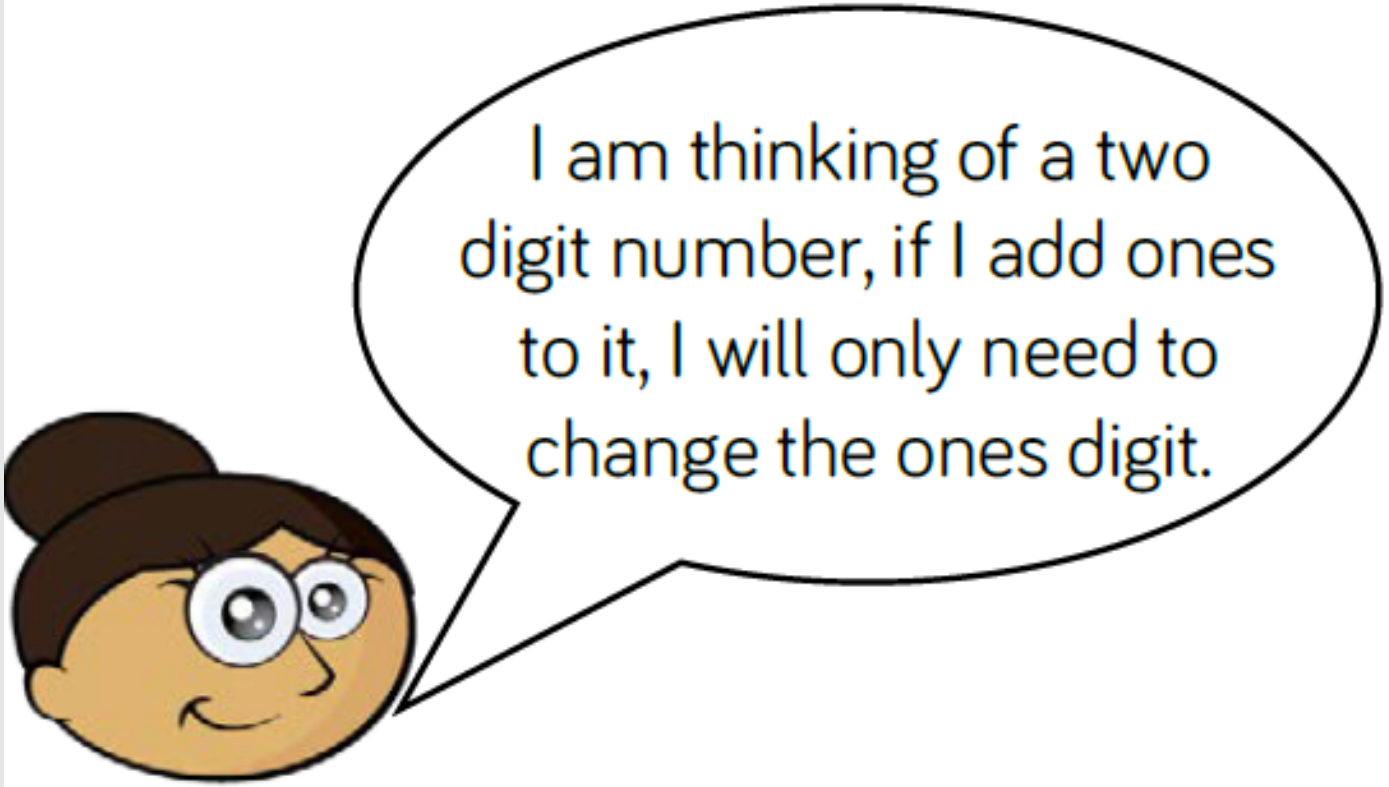
Take 16 away from 34



$$\begin{array}{r} {}^{2}\not{3}\,{}^{1}4 \\ -\,1\;6 \\ \hline 1\;8 \\ \hline \end{array}$$

Problem solving

Always, sometimes, never?



Explain your answer.

Problem Solving 2

Quinton and Mira are counting flowers in their back garden

Quinton counts 41 daisies.

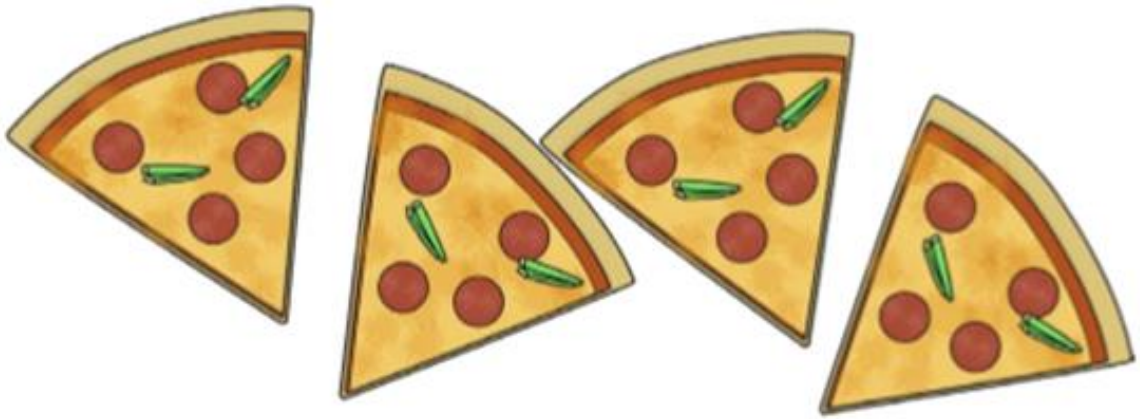
Mira counts 54 tulips.

How many flowers are in their garden in total?

Problem solving

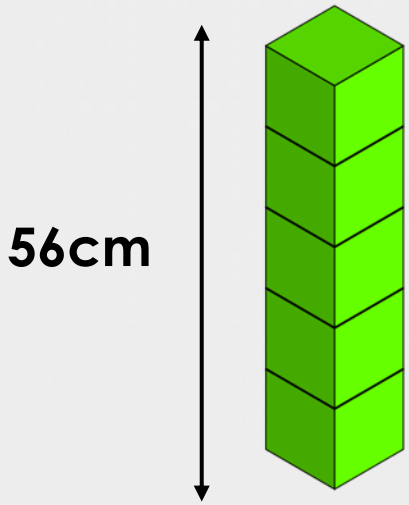
Problem solving

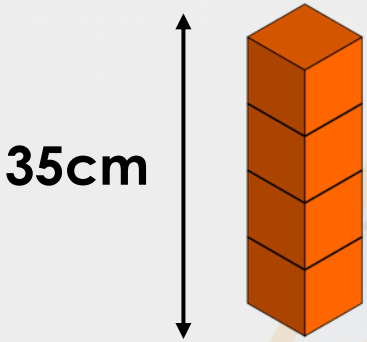
If you have 59 pieces of pizza and Class 1 eats 21 pieces and Class 2 eats 23 pieces. How many pieces of pizza would be left?



Varied Fluency 4

Eva builds a tower 56cm high. Thomas builds a tower 35cm high.





How tall are the towers altogether?

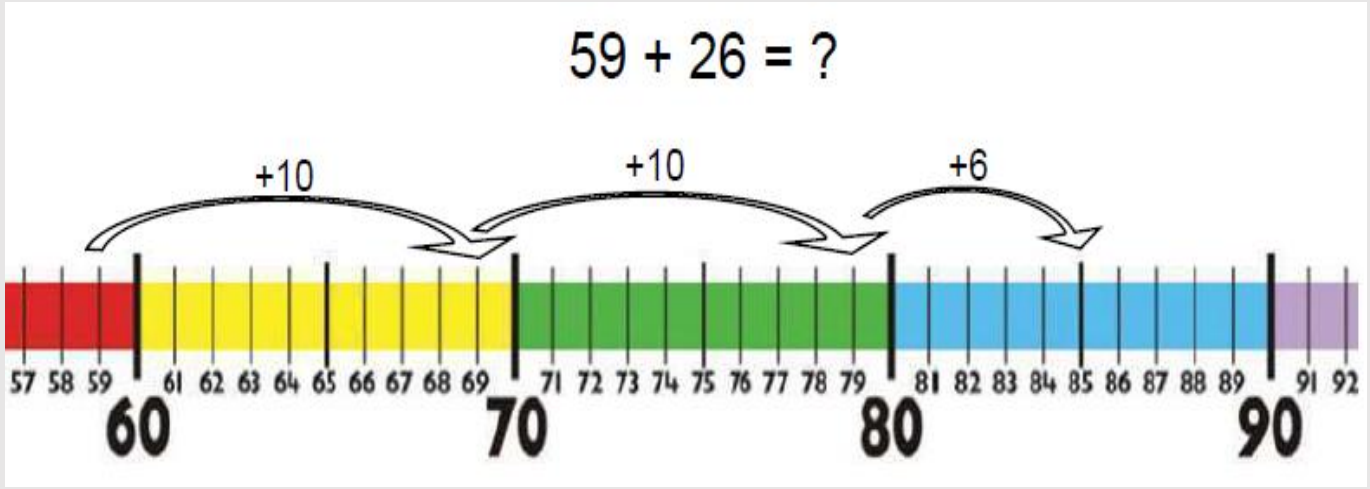
Problem solving

Problem solving

1. Oscar buys 2 packets of crisps. How much do they cost altogether? He has £1 to spend altogether. He also wants to buy a drink. Has he got enough money left?

Adding using a number line and counting on or back

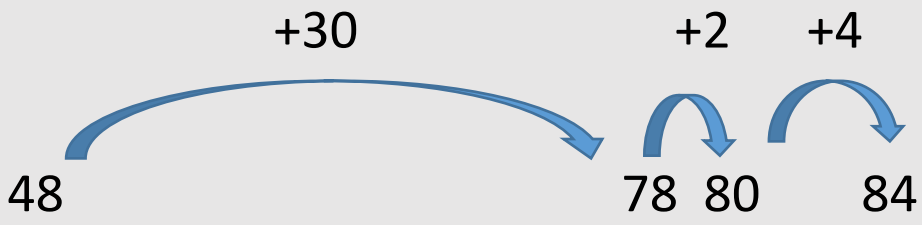
Adding two two-digit numbers by using a number line.



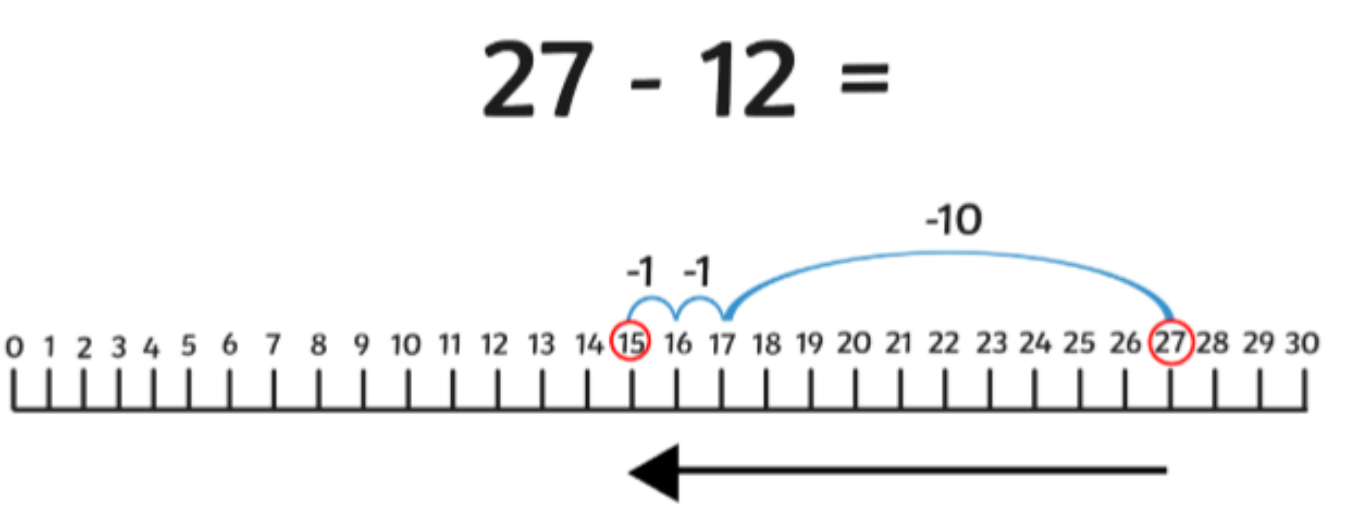
Adding and subtracting two two-digit numbers.

Once children are confident using place value and number facts they will move to more efficient jumps.

48 + 36 =



Adding and **subtracting** two two-digit numbers.



Commutative

(a calculation that can be done in any order)

Inverse

Addition is commutative

$$3 + 16 = 19$$

$$16 + 3 = 19$$

Subtraction is not commutative

$$17 - 4 = 3$$

$$4 - 17 = 3$$

Adding 3 digit numbers

Which numbers would you add together first in the following number sentences? Why would you add those first?

$$3 + 5 + 7 =$$

$$8 + 2 + 6 =$$

$$4 + 3 + 4 =$$

Is there always an easier order to add three one digit numbers?

Children need to understand that addition can be done in any order (commutative)

$$12 + 2 + 8 =$$

$$9 + 7 + 13 =$$

$$10 + 50 + 50 =$$

Problem solving

Captain Conjecture says,
'An odd number + an odd number + an odd number = an even number'.

Is this sometimes, always or never true?

Explain your reasoning.

Concrete resources might help pupils to explain their reasoning.

There are some more ideas of how to help your child with maths at home on the website in the Year 2 handbook.

Some useful websites

http://www.bbc.co.uk/bitesize/ks1/maths/

http://www.ictgames.com/resources.html

http://www.mathszone.co.uk/

http://www.topmarks.co.uk/