# Mathematics

MAY NOT TEACH US HOW TO ADD LOVE OR MINUS HATE. BUT IT GIVES US EVERY REASON TO HOPE THAT EVERY PROBLEM HAS A SOLUTION.

# Welcome to the KS1 maths workshop

9th October 2019

# Objectives

- Explain and demonstrate how maths is taught in KS1
- Understand what is meant by ‘Mastery’
- Identify how fluency impacts upon mastery
- Increase confidence and understanding at home.

# As a child…

- Discuss 2 positive and negative experiences of maths that you had when you were a child

# Supporting your child

- If children hear, ‘I can’t do maths’ from parents, teachers, relatives and friends, they begin to believe it isn’t important.

# The curriculum

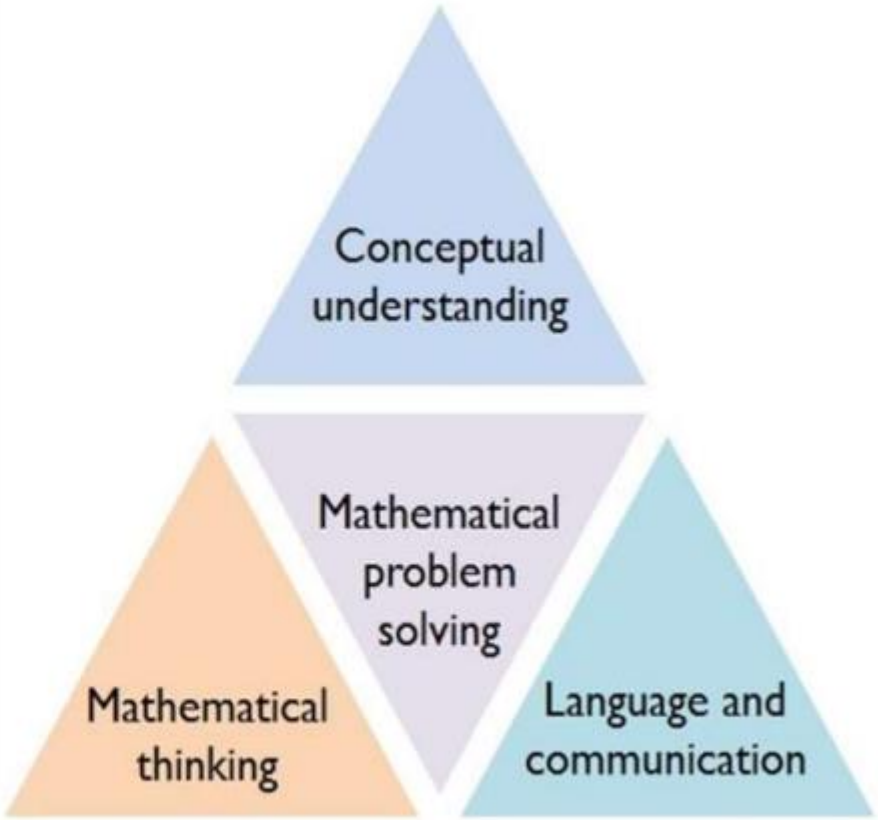
The curriculum is designed so that pupils explore mathematical ideas **in depth**.

- Number – number and place value
- Number – addition and subtraction
- Number – Multiplication and division
- Number – fractions
- Measurement
- Geometry: properties of shape
- Geometry – position and direction
- Statistics (Year 2 only)

- Mastery curriculum
- Reading and spelling of mathematical vocabulary

# Maths mastery

- Using spoken and written language with confidence and clarity to explain and justify mathematical reasoning.
- Having a deep conceptual understanding of mathematical concepts and skills.
- Developing mathematical thinking, including generalising, classifying and comparing, and modifying.



# What does it mean to master something?

- I know how to do it
- It becomes automatic and I don't need to think about it – for example driving a car
- I'm really good at doing it – painting a room or a picture
- I can show someone else how to do it

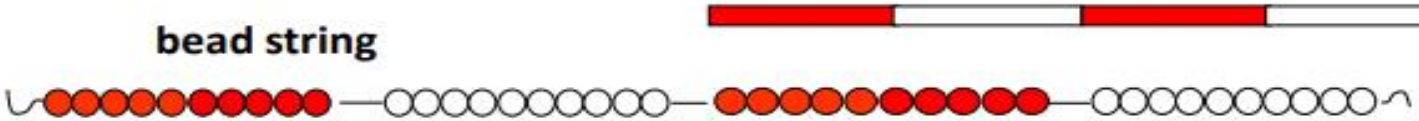
# What is mastery in maths?

***"In mathematics, you know you've mastered something when you can apply it to a totally new problem in an unfamiliar situation."***

Dr. Helen Drury, Director of Mathematics Mastery

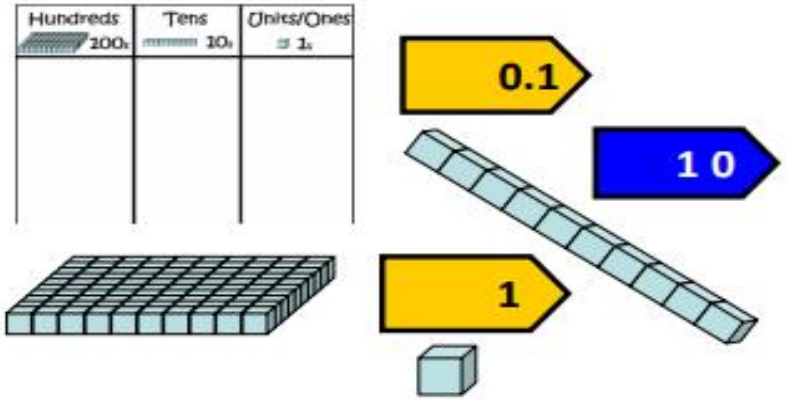
# Resources

bead string



count stick

place value apparatus

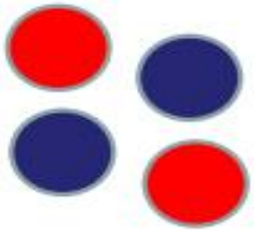



Multilink

place value counters


Cuisenaire

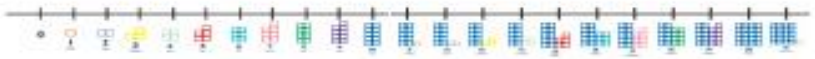
Numicon

double sided counters

number grids 100 and 200

number line



# Progression in calculation

## FOUNDATION

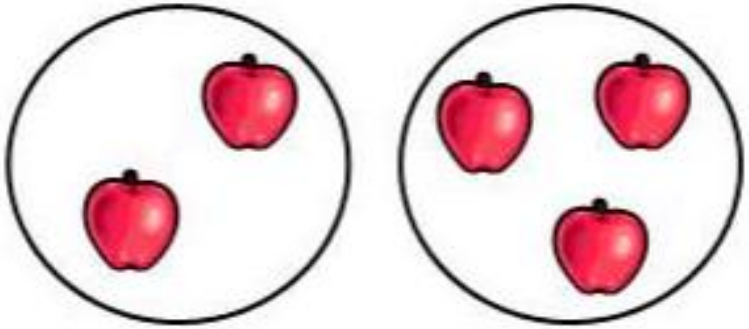
### Calculation Strategies

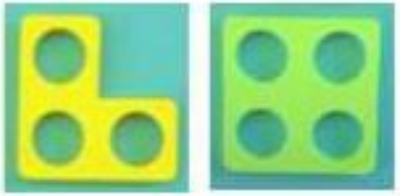
**Counting on from a number to find the total**

I have 5 pennies in my tin. I put in one, two, three pence more. How many pennies are in the tin now?

Use moveable objects when finding totals.
Touch and align each object as it is counted.

Count first group, start count from first group's total when counting second group





3 4

# Progression in calculation cont…

YEAR 1

## Calculation Strategies


3 + 2 = 5

Jane had 3 bears. She was given 2 more. How many does she have now?

**Addition in any order**

Use numberline and Numicon to show that addition can be done in any order

3 + 4 + 7 = 3 + 7 + 4

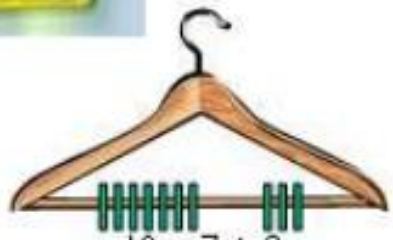
**To support learning of number facts using a variety of visual resources:**

**Bonds to 10**

Flip flap

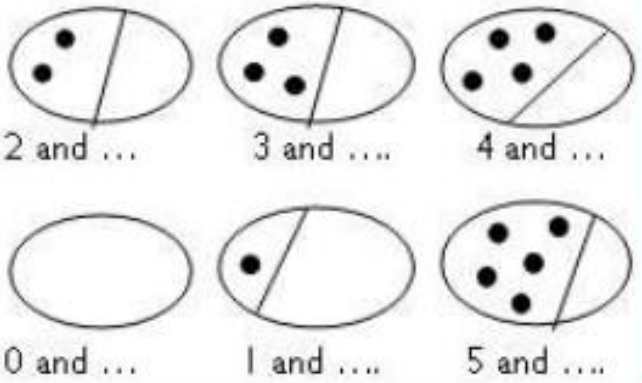
7 + 3 = 10


7 + 3 = 10



10 = 7 + 3

**Make 6**



# Progression in calculation cont…

YEAR 2

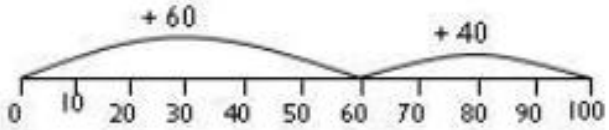
## Calculation Strategies

### Number Stories

There are 50 people on the bus 16 more get on how many altogether?

### Number bonds

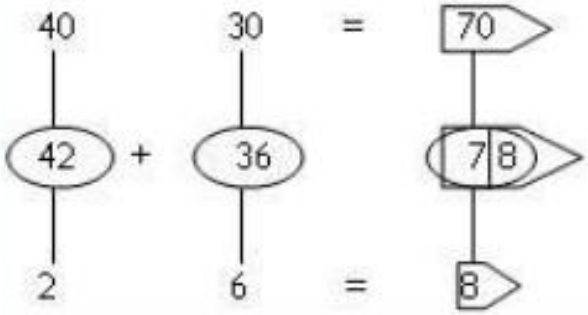
Use knowledge of number bonds to 10 to help with bonds to 20 and multiples of 10 to 100


60 + 40 = 100

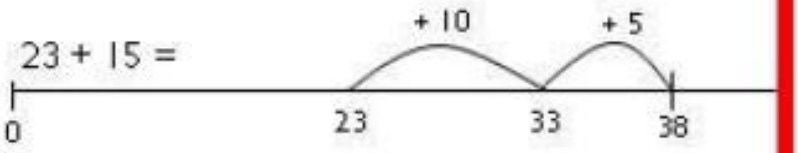
### Addition as partitioning and recombining:

42 + 36 =



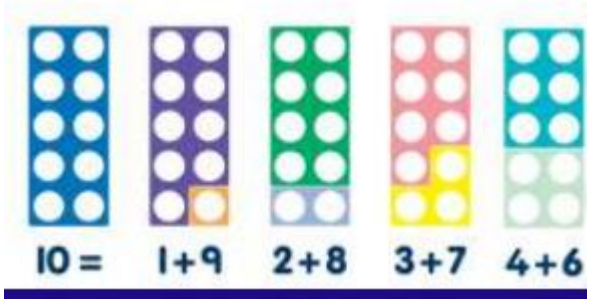

12 + 23 = 12 + 20 + 3

23 + 15 =



# What facts do they need to be able to recall?

- Number bonds – Addition and subtraction
- Doubles and halves
- Near doubles
- Times tables

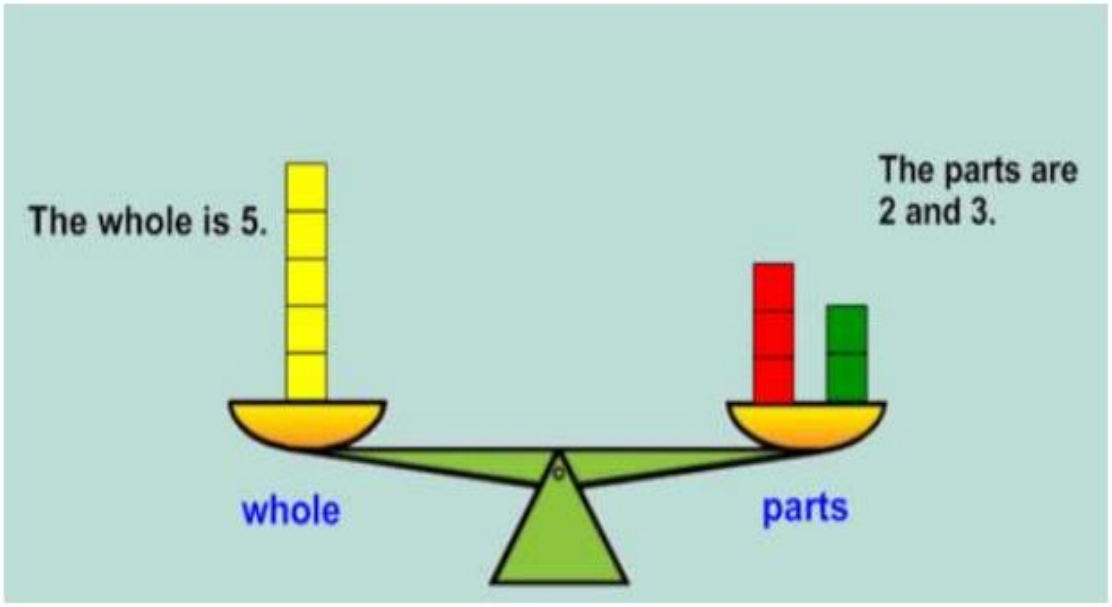


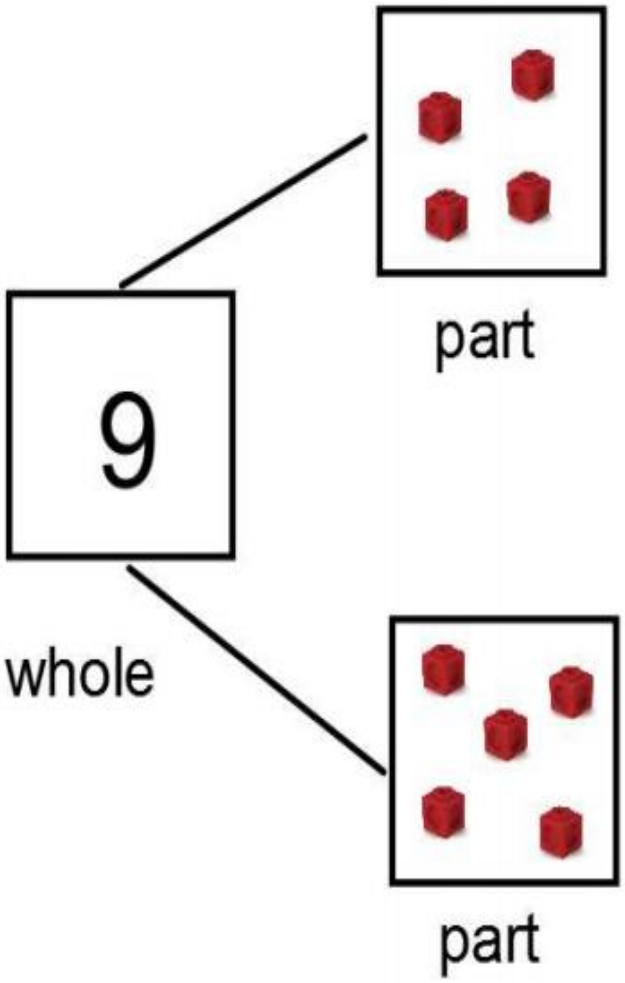
# Key models and images

- Part, part whole
- Ten frame
- Place value chart

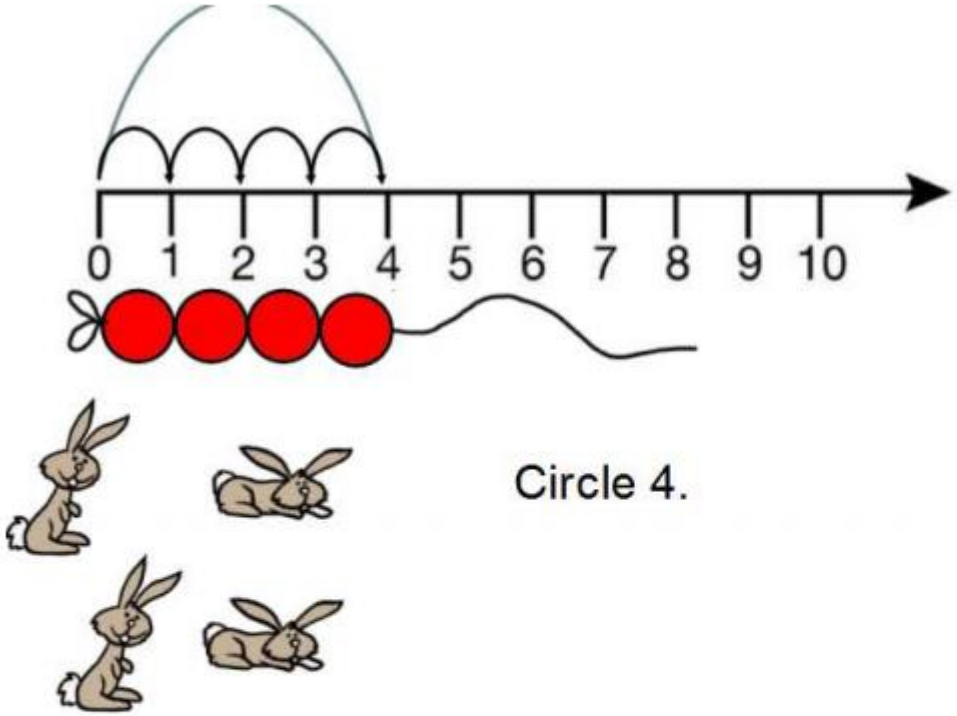
- Base 10

# Part, part whole & number bonds



# Number lines and bead strings




Circle 4.

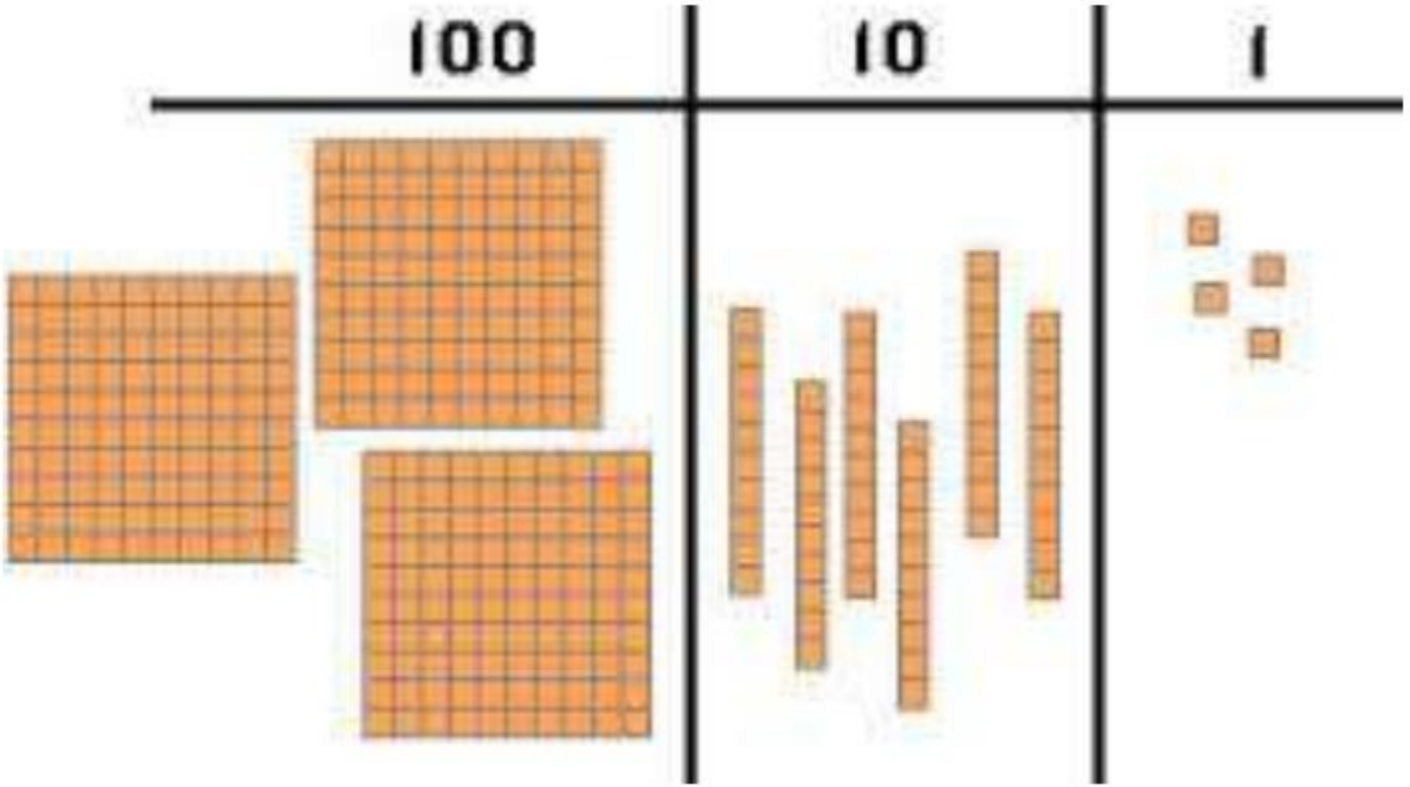
**What is one more than 4?**

_____ is one more than 4.

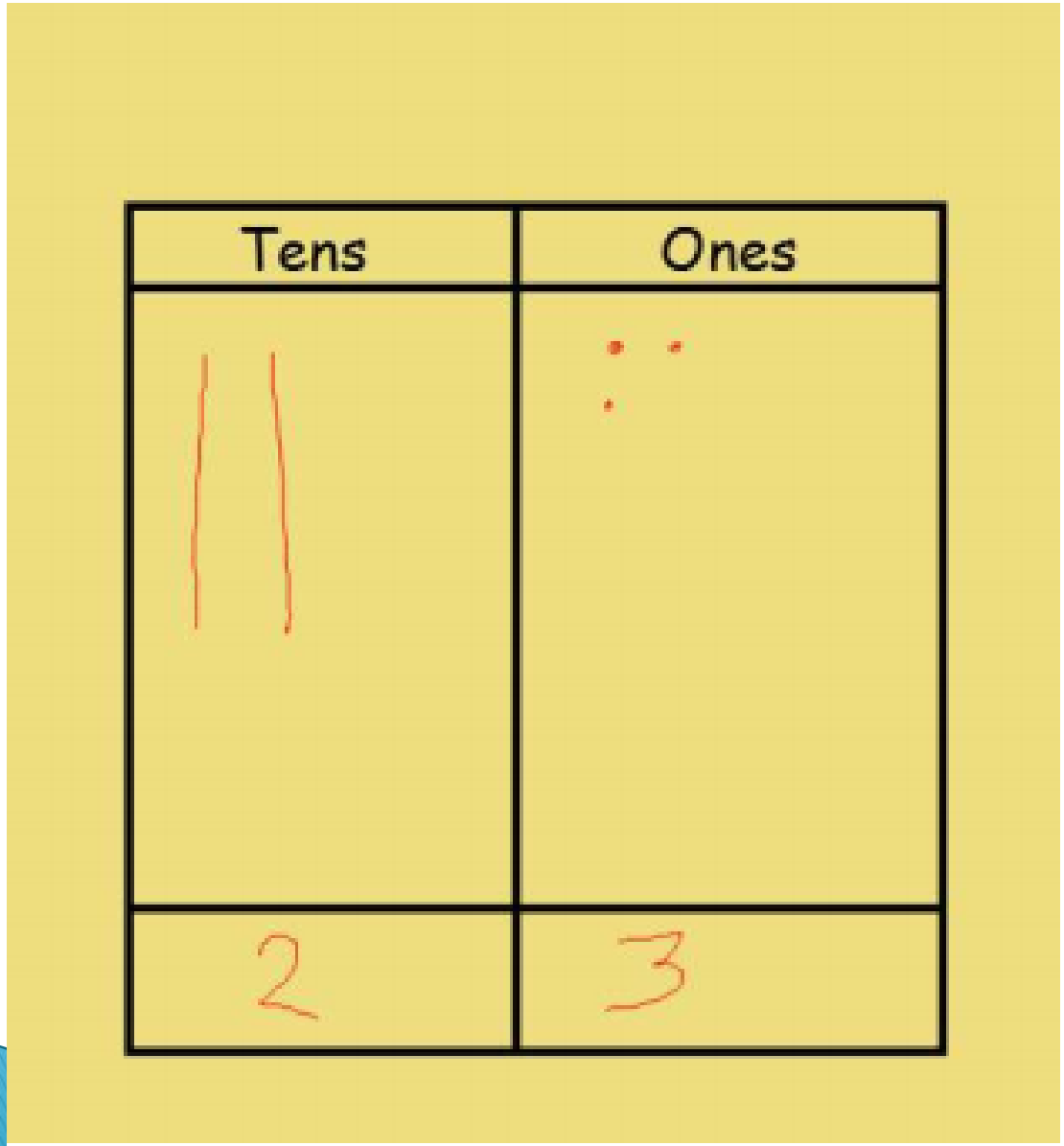
# Place value

- Place value is at the heart of the number system. All digits have a value and a secure understanding of this will enable children to use and understand different calculation methods.

# Place value cont....

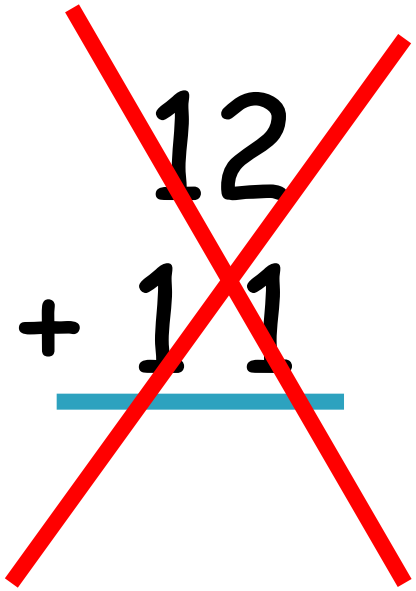


# Place value chart



# The four operations

# Value of numbers

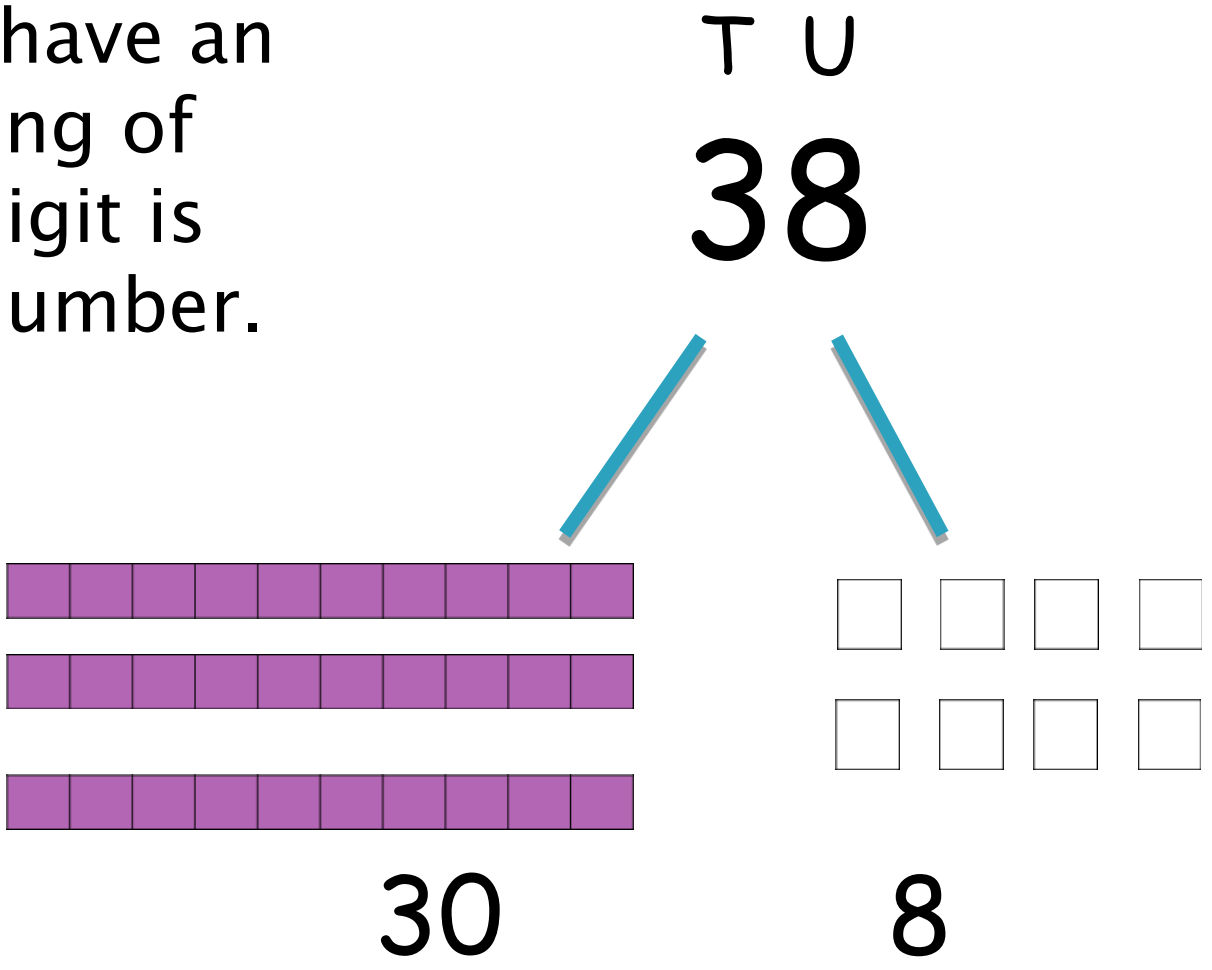



12 + 11 =

10 2 10 1

# Place value

- We need to have an understanding of what each digit is worth in a number.



- Once we understand what each digit is worth we can start to calculate various number sentences e.g. addition and subtraction

# Addition

- We teach addition as finding the total by adding various amounts together.

Words used for addition:

- Total
- Add
- Plus

# Meaningful problems

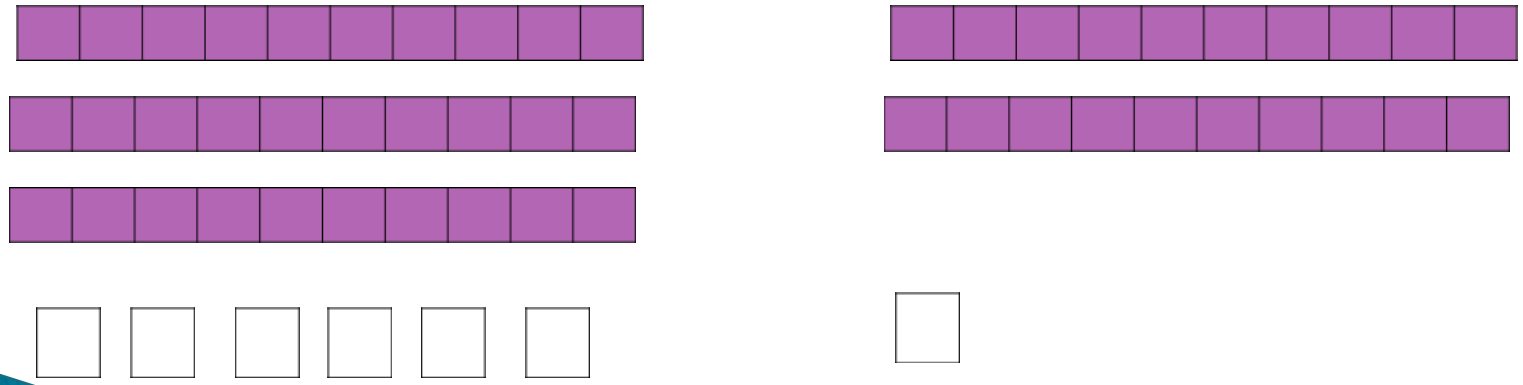
We aim to make every area of maths purposeful. Therefore where possible we use a real-life problem to enable children to see the purpose behind that particular area of maths.

E.g.

Year 1 went on a school trip to the zoo. There were 36 children on one bus and 21 on the other. How many children were there altogether?

# Addition

| T | U | | T | U | | |
|---|---|---|---|---|---|---|
| 3 | 6 | + | 2 | 1 | = | 57 |
| 30 | 6 | | 20 | 1 | | |



# Have a go at some of these!

- Use the tens and units cubes to calculate the number sentence or draw the tens and units if you prefer.

45 + 23 =

64 + 32 =

55 + 37 =

# Subtraction

- We teach subtraction in two ways. By finding the difference and by taking a smaller amount from a larger amount.

# Meaningful problems

Adam was 18 and his younger sister was 13. What is the difference in their ages?

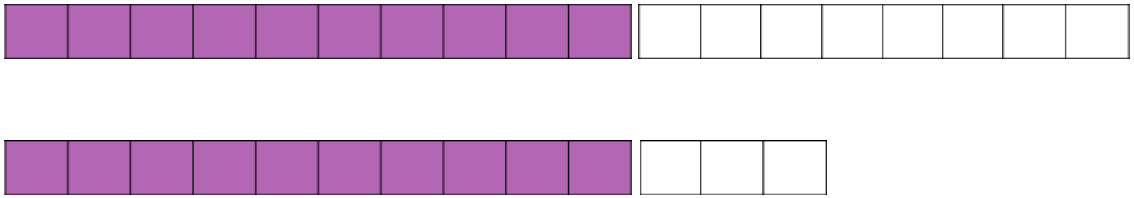
# Finding the difference

- This method is used when the numbers are close together
- E.g. 18 – 13 =

  25 – 22 =

# Finding the difference

| T | U | | T | U | |
|---|---|---|---|---|---|
| 1 | 8 | − | 1 | 3 | = 5 |

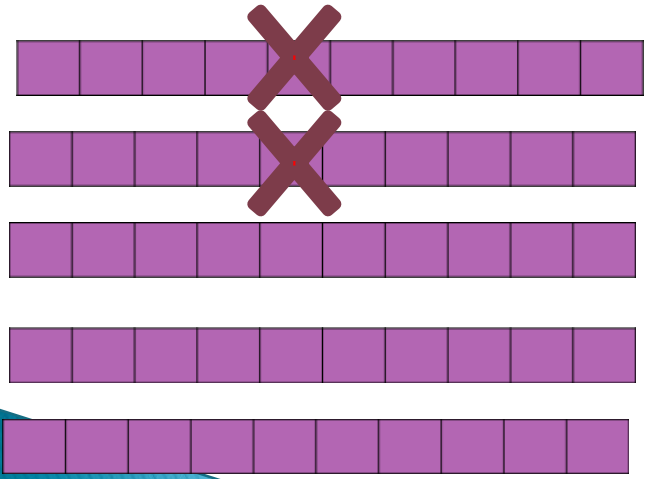


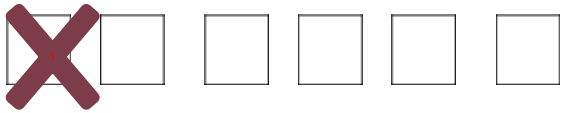
# Meaningful problems

There were 56 children at the zoo and 21 of them had to leave early. How many were left at the zoo?

# Subtraction as take away

| T | U | | T | U | | |
|---|---|---|---|---|---|---|
| 5 | 6 | - | 2 | 1 | = | 35 |
| 50 | 6 | | 20 | 1 | | |





# Have a go at some of these!

- Use the tens and units cubes to calculate the number sentence or draw the tens and units if you prefer.

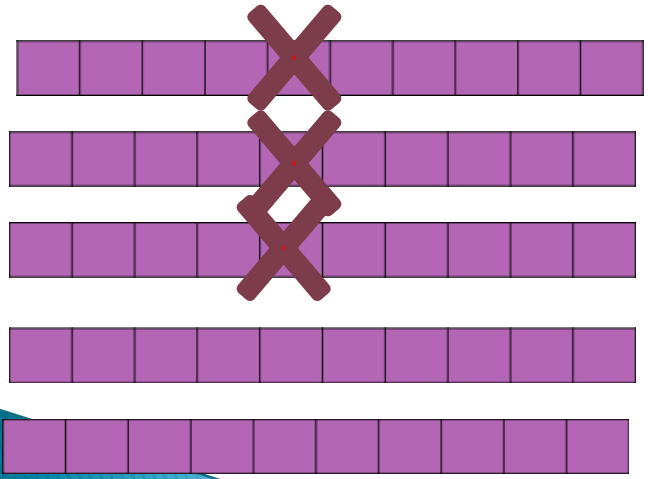
45 - 23 =

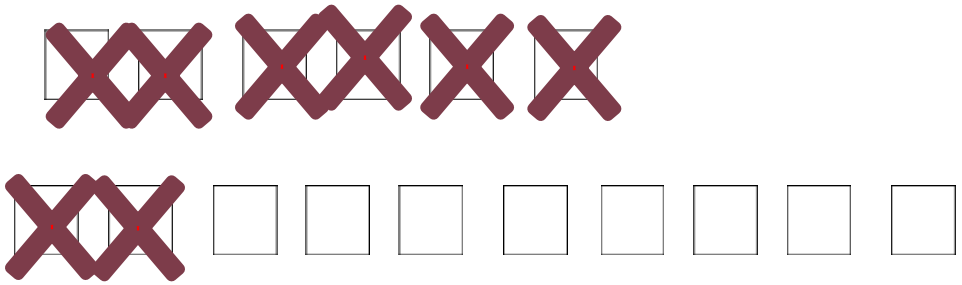
64 - 32 =

55 - 37 =

# Subtraction as take away

| T | U | | T | U | |
|---|---|---|---|---|---|
| 5 | 6 | - | 2 | 8 | = 28 |
| 50 | 6 | | 20 | 8 | |





# Multiplication

- Multiplication is known as grouping. Children need to practice counting in groups to find multiplication easier.
- Multiplication is also known as:

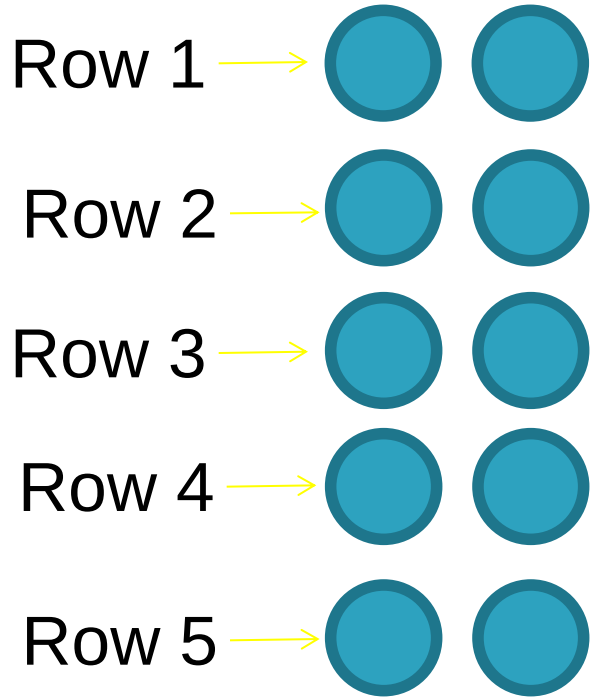
- Groups of
- Lots of
- Times
- Multiply

# Meaningful problems

At a birthday party, there were 5 children. Each child had 2 sausage rolls on their plate. How many sausage rolls were there altogether?

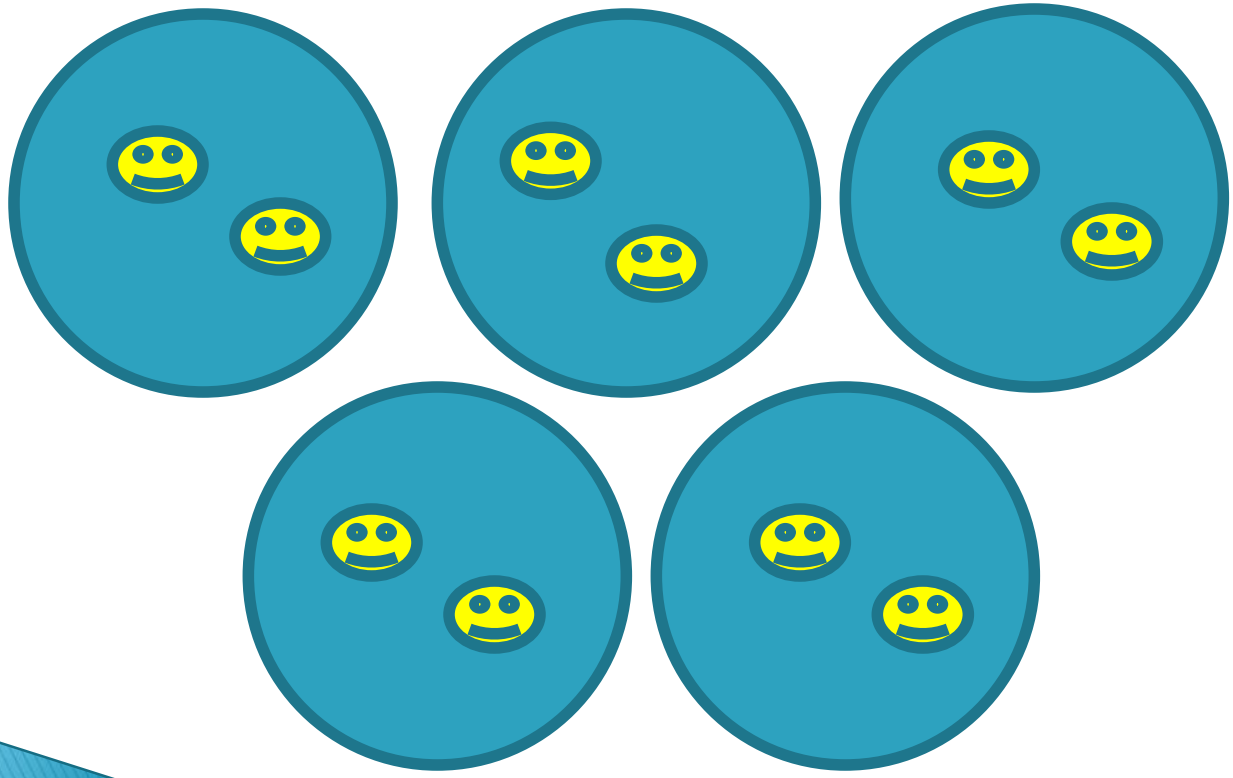
# Multiplying/Grouping

5 x 2 =



# Multiplying/Grouping

$$5 \times 2 = 10$$



# Have a go at some of these!

- Draw the groups and then put the correct number of items in each group.

$3 \times 5 =$

$6 \times 2 =$

$3 \times 10 =$

# Division

Division is known as sharing.

Division is also known as:

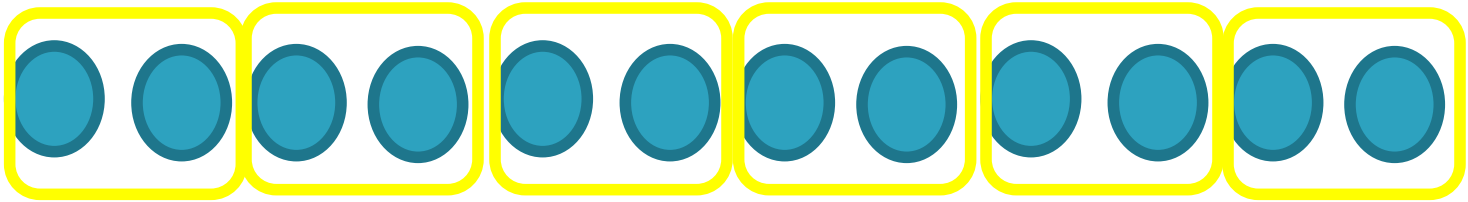
- grouping
- sharing
- Divide
- Share equally

# Meaningful problems

There were 12 sweets in a bag. They had to be shared equally between 2 children. How many would they each get?

# Dividing/sharing

$12 \div 2 = 6$



# Have a go at some of these!

- Draw the groups and then put the correct number of items in each group or draw the number of items and group them accordingly.

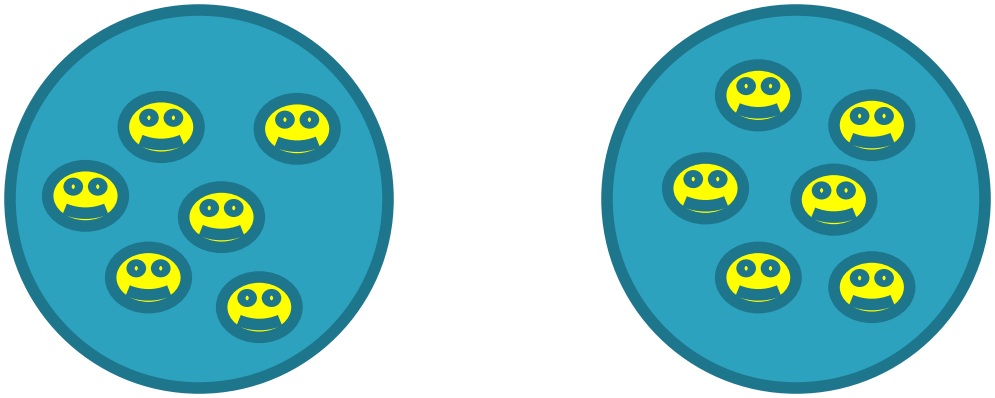
$14 \div 2 =$

$15 \div 5 =$

$16 \div 2 =$

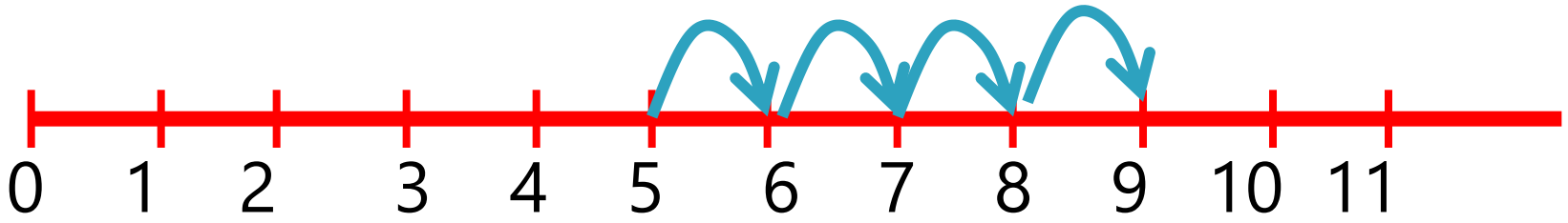
# Dividing/sharing equally

$$12 \div 2 = 6$$



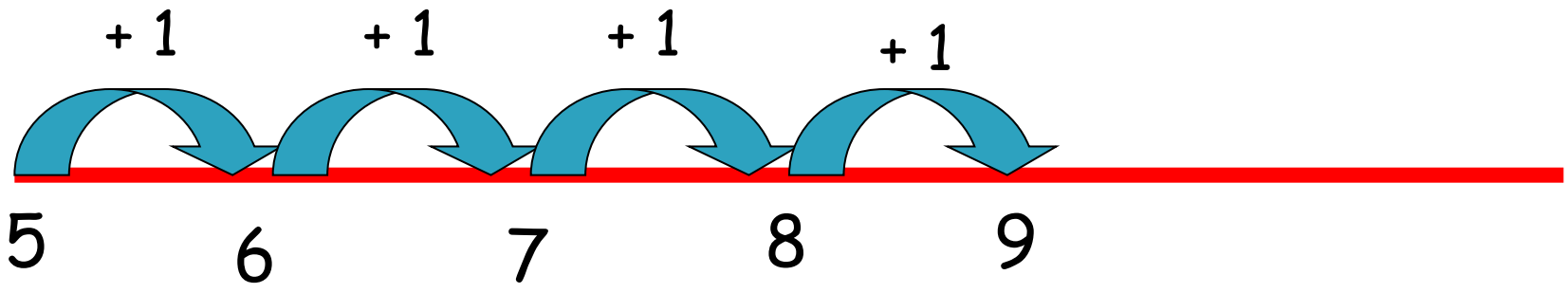
# Number tracks

5 + 4 = 9

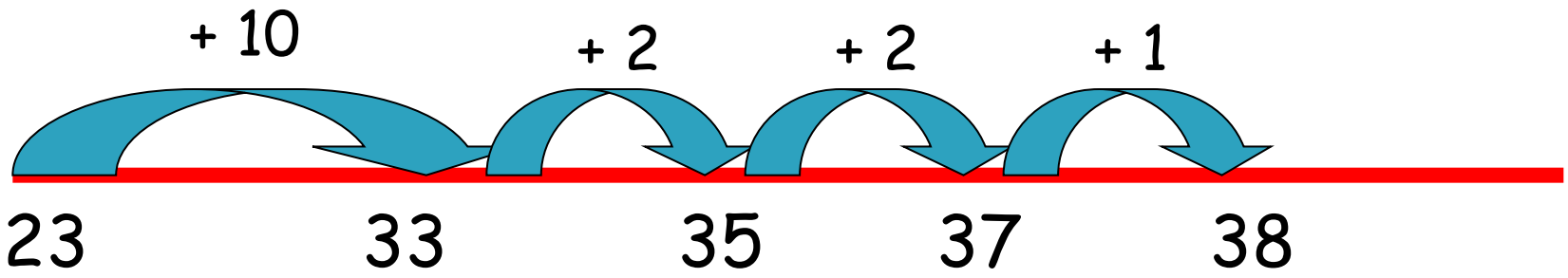


# Number lines

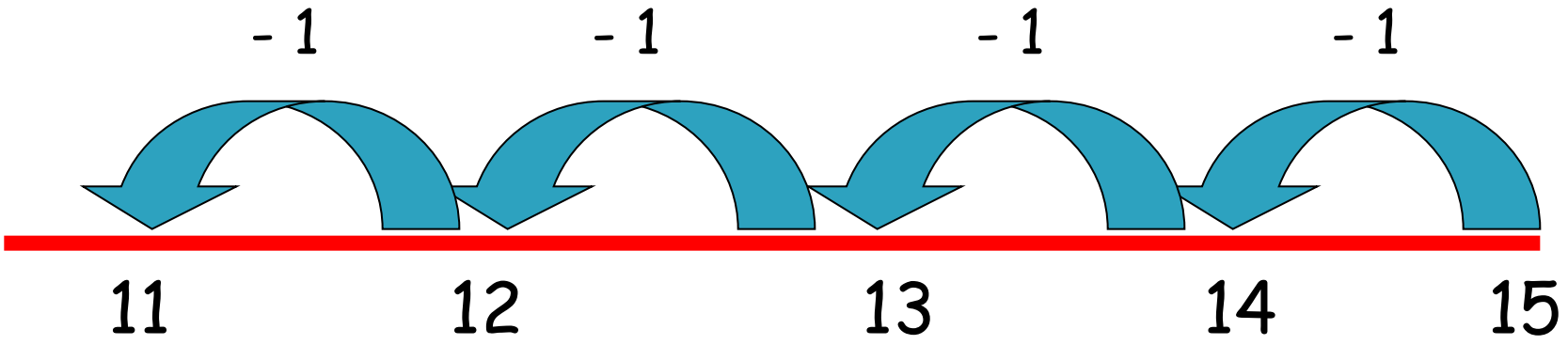
5 + 4 = 9



# 23 + 15 = 38

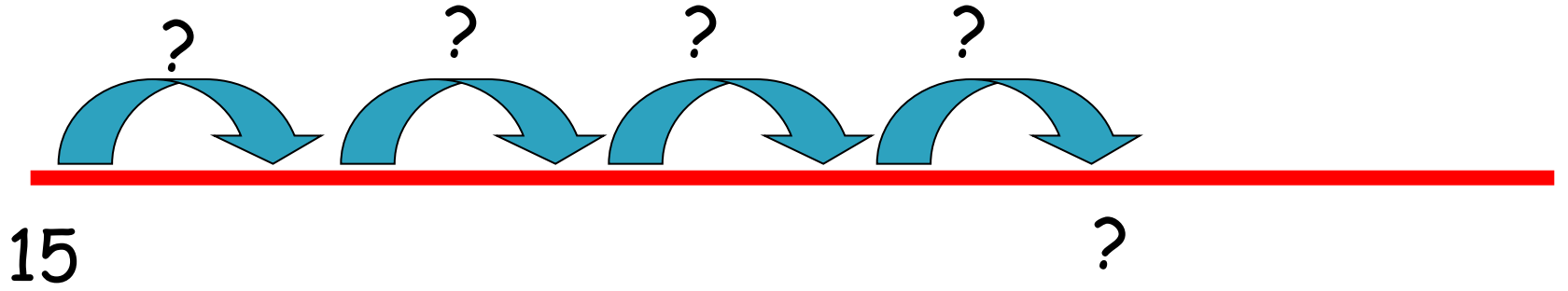


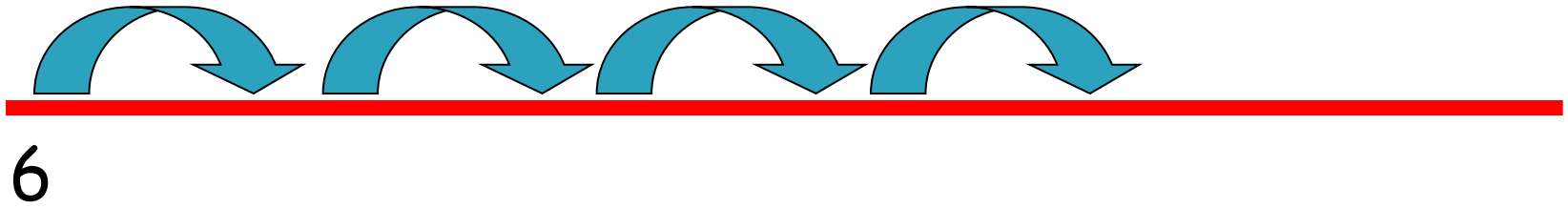
# 15 - 4 = 11



# Common mistakes

15 + 6 = ?

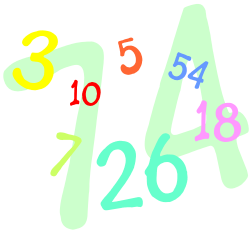


# Strategies

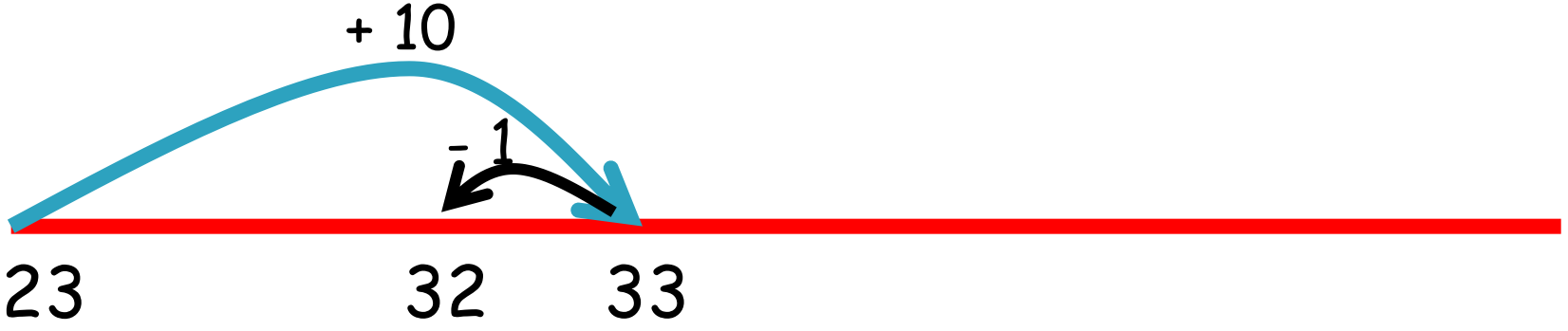
- Children use various strategies to assist their learning

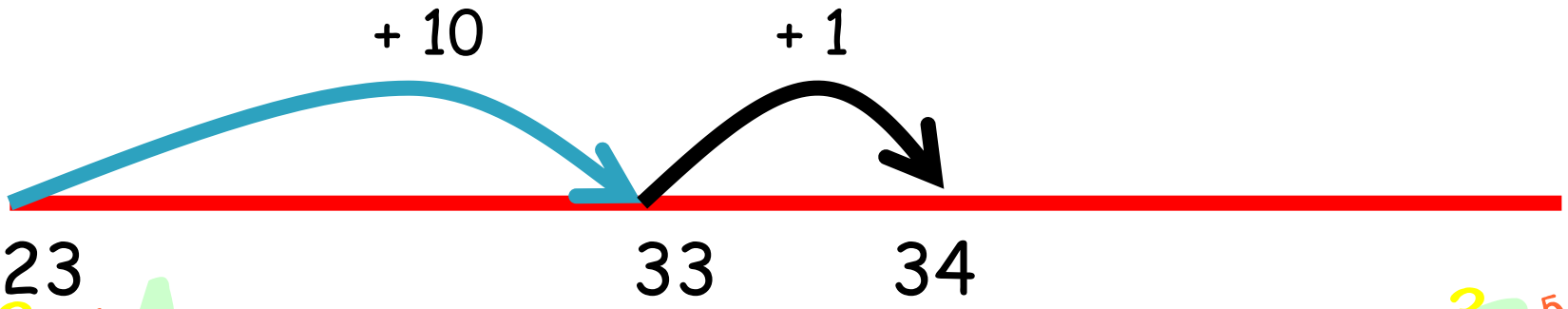
- They use their knowledge of number bonds to 10 and 20 to assist them with addition and subtraction

# Strategies

- Children add 9 and 11 by adding 10 and adjusting by 1



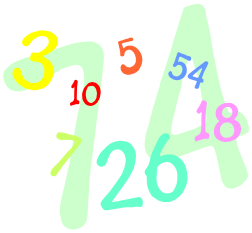



# Strategies

- Children also learn doubles and halves of numbers up to 10 and 20 to help solve simple problems

5 + 5 = 10

5 + 6 = 11

# How can you help at home?

- Fluency is key
  - Number facts
    - Including subtraction facts as well.
    - Doubles and halves
  - Skip counting
  - Times tables
- Practise, practise, practise!
- Other activities can include:
  - Practise writing number formation
  - Match words to numbers
- **Think and talk like a mathematician**

# Other ideas

- **Follow a recipe:** work together to find the quantity needed and ask your child to weigh the ingredients, discuss how you would double or halve the recipe
- **Go shopping**: Talk about the cost of items. Let your child choose the coins when paying. What if you bought two things?
- **Plan an outing**: discuss how long it takes to get to a place and then what time you need to leave the house
- **Talk about the weather forecast**: is today's temperature higher or lower than yesterday? What do the numbers mean?

# Questions


WHY?
WHAT?
WHERE?
WHEN?
WHO?
HOW?
WHICH?
WHOSE?
WHAT? HOW? WHY?
WHO? WHERE? WHAT? HOW?
WHY? HOW? WHERE?
WHO? WHOSE?
WHERE? WHAT? HOW?
WHERE? WHICH? WHOSE? WHEN? WHY?
WHEN? WHERE?
WHY? HOW?
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WHO? WHERE? WHAT? HOW?
WHAT? HOW? WHY?
HOW?

WHAT IF THE ALGEBRA TEACHERS ARE REALLY PIRATES, AND ARE USING US TO FIND THE "X"


DESPICABLEMEMINIONS.ORG