

Coffee and Calculations



Workshop 1

Aims of session



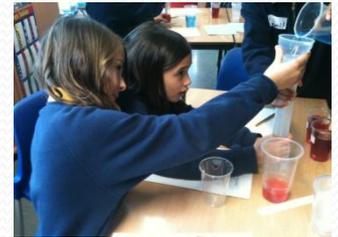
To help you:

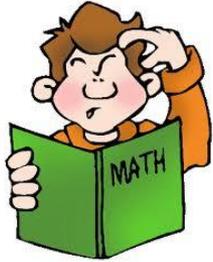
- Develop your knowledge of the addition methods that children use in school
- Understand the progression within the methods used as children move up through the school
- Support your child's learning at home



Key differences today

- ❖ Interactive teaching
- ❖ Emphasis on mental calculation
- ❖ Different approach to written calculation
- ❖ Maths through problem solving
- ❖ Maths is fun!





At Gillespie



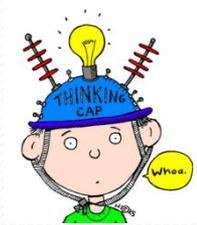
We want children to be able to do mathematics in their heads, and if the numbers are too large, to use pencil and paper.

also



We want children to learn quick and efficient mental and written methods.

We want children to ask themselves



- *Can I do this in my head?*
- *Can I use drawings or jottings to help me?*
- *Do I need to use a written method? (pencil and paper)*
- *Do I need a calculator?*
- *Finally – Is my answer sensible?*

Head, written or calculator



$$1,254 + 2,336$$



$$46 + 37$$

$$1463 + 102$$

$$(11 \times 19) + (234 \div 9)$$

$$126.52 + 8.67$$

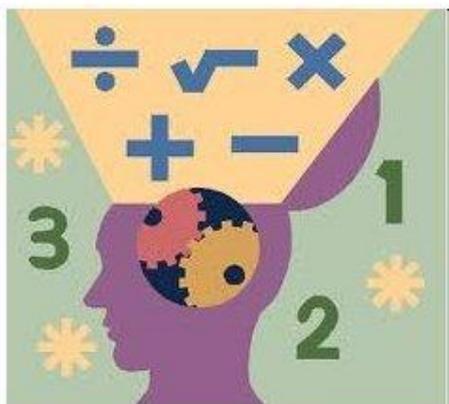


$$89 + 9$$

Mental Calculation

Children need to have various mental strategies at their disposal to help them develop their written methods of recording. They need to be able to:

- ❖ instantly recall number facts
(+ - × ÷)
- ❖ have a secure understanding of place value and the number system



- ❖ know the best strategy to apply to a calculation
- ❖ Understand the language and rules of maths

Place Value

Th H T U . Tenths Hundredths

5
5 0
5 0 0
5 0 0 0
0 . 5
0 . 0 5

Developing
into decimals

Number bonds

A **Number bond** (sometimes called **addition fact**) is a simple addition sum which has become so familiar that a child can recognise it and complete it almost instantly.

e.g. **Number bonds to 10**

$$4 + 6 = 10$$

$$7 + 3 = 10$$

$$8 + 2 = 10$$

A secure knowledge of number bonds will help children cope with and feel confident with larger numbers.

e.g. $70 + 30 = 100$

$$700 + 300 = 1000$$

Adding tens to numbers

When children count forwards and backwards in tens from any whole number, they should recognise that the tens digit will change, while the units digit remains the same.

$$23 + 10 = 33$$

$$33 + 10 = 43$$

$$43 + 50 = 93$$

Then, being able to cross the hundreds boundary.

$$43 + 60 = 103$$

Partitioning

(Splitting the number into parts (H T U))

$$87 = 80 + 7$$

$$346 = 300 + 40 + 6$$

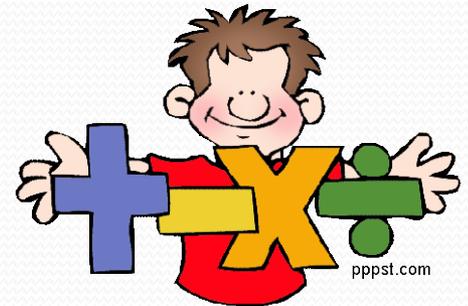
Vocabulary of addition



Written Calculation



□ Throughout their time at Gillespie, we want children to progress from informal jottings to efficient written methods for each of the number operations.



□ Standard written methods are introduced where children have a secure knowledge and understanding of the process involved and can clearly explain the strategies they have used.

Progression in addition

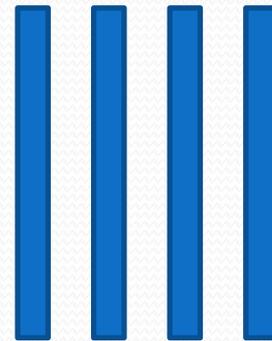
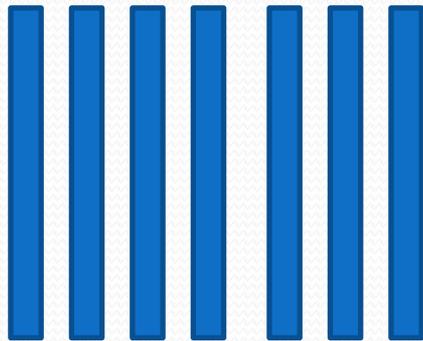
$$2+3=$$

At a party, I eat 2 cakes **and** my friend eats 3. How many cakes did we eat **altogether**?



$$7+4=$$

7 people are on the bus. 4 **more** get on at the next stop. How many people are on the bus now?



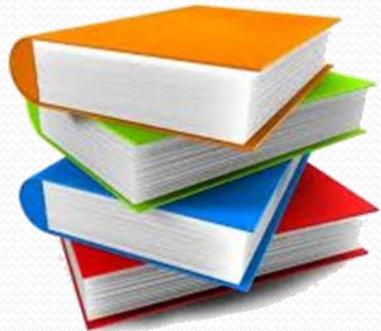
45 + 36 =

There are 45 books on a shelf in the library **and** 36 books get added.

What is the **sum total** of books on the shelf?

$$\begin{array}{c} 45 + 36 \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ 40 \quad 5 \quad 30 \quad 6 \end{array}$$

Use partitioning (split) each number into tens and units



$$40 + 30 = 70$$

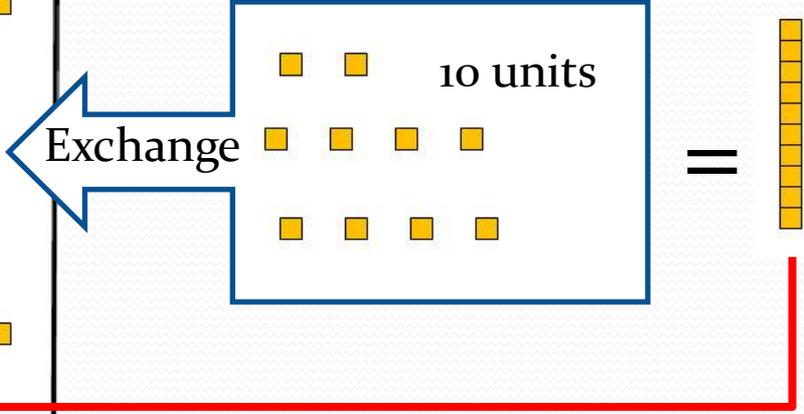
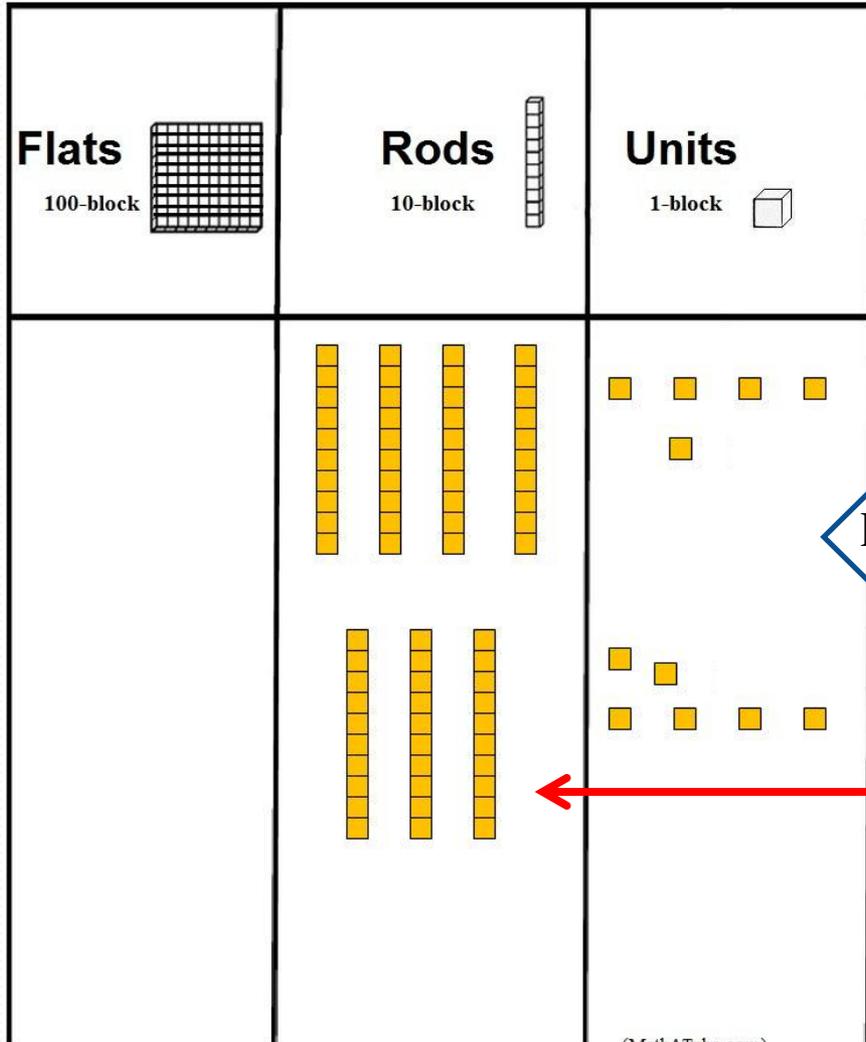
$$5 + 6 = 11$$

$$70 + 11 = 81$$



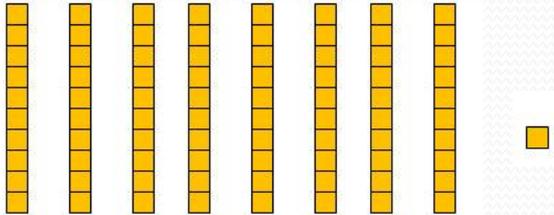
Base 10 Equipment

$$45 + 36 =$$



Answer:

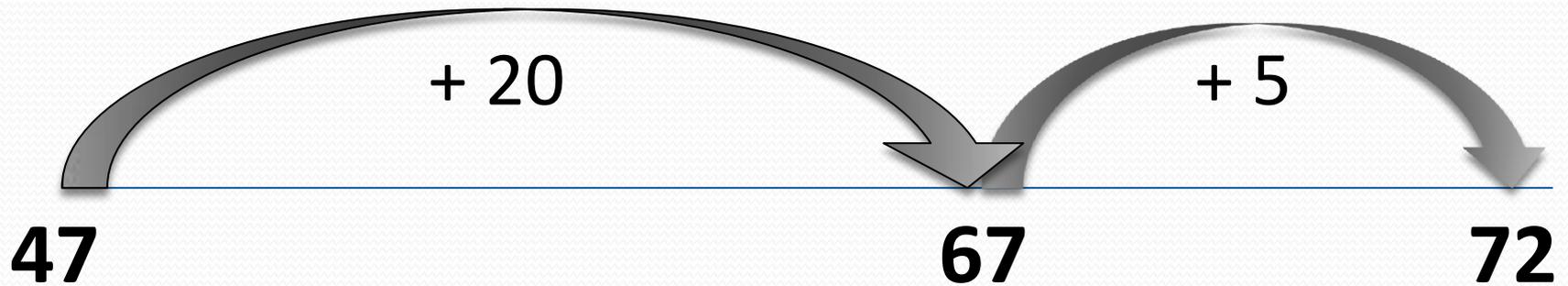
81



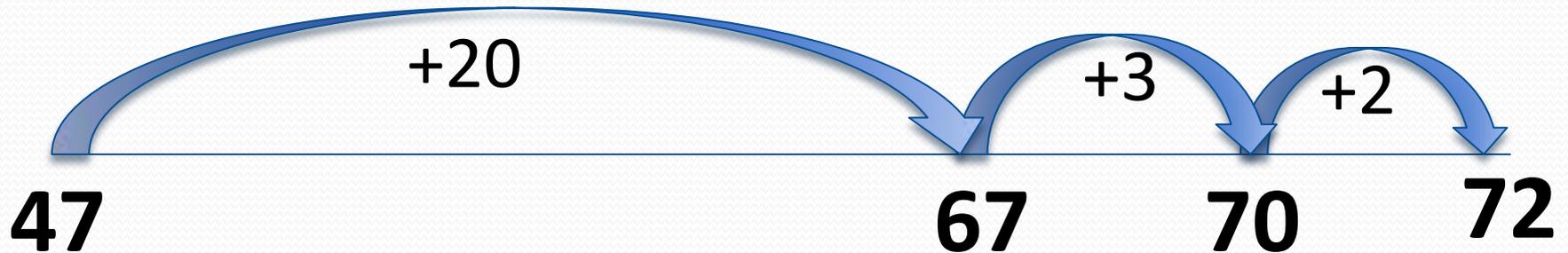
$$47 + 25 =$$



My sunflower is 47cm tall. It grows another 25cm. How tall is it now?



OR



$$487 + 546 =$$

There are 487 boys and 546 girls in a school.
How many children are there in **total**?



$$\begin{array}{r} 546 \\ +487 \\ \hline 13 \\ 120 \\ 900 \\ \hline 1033 \end{array}$$

Expanded column
method

$$12,786 + 2,568 =$$

12,786 people visited the museum last year. The numbers **increased** by 2,568 this year.

$$\begin{array}{r} 12,786 \\ + 2,568 \\ \hline \end{array}$$

$$\hline 15,354$$

1 1 1

How many people **altogether** visited this year?



Development of addition...

❖ Adding decimal numbers

e.g. $83.4 + 46.74$, $3.65 + 0.04$

❖ Adding more than two numbers

Investigations & having fun!



5, 2, 7

What sums can you make with these numbers?

How many different ways can you make 50p?



With a partner take turns to roll dice. Add and find totals. First to reach a chosen number wins! (lots of variation)



There were 22 legs creeping across the web. How many flies? How many spiders?



In this addition sum, each letter represents a different non-zero digit.

$$\begin{array}{r} \text{fly} \\ + \text{fly} \\ \hline \text{fly} \\ \hline \text{a way} \end{array}$$

A set of ten cards, each showing one of the digits from 0 to 9, is divided up between five envelopes so that there are two cards in each envelope. The sum of the two numbers inside it is written on each envelope:

What numbers could be inside the 8 envelope?

7

8

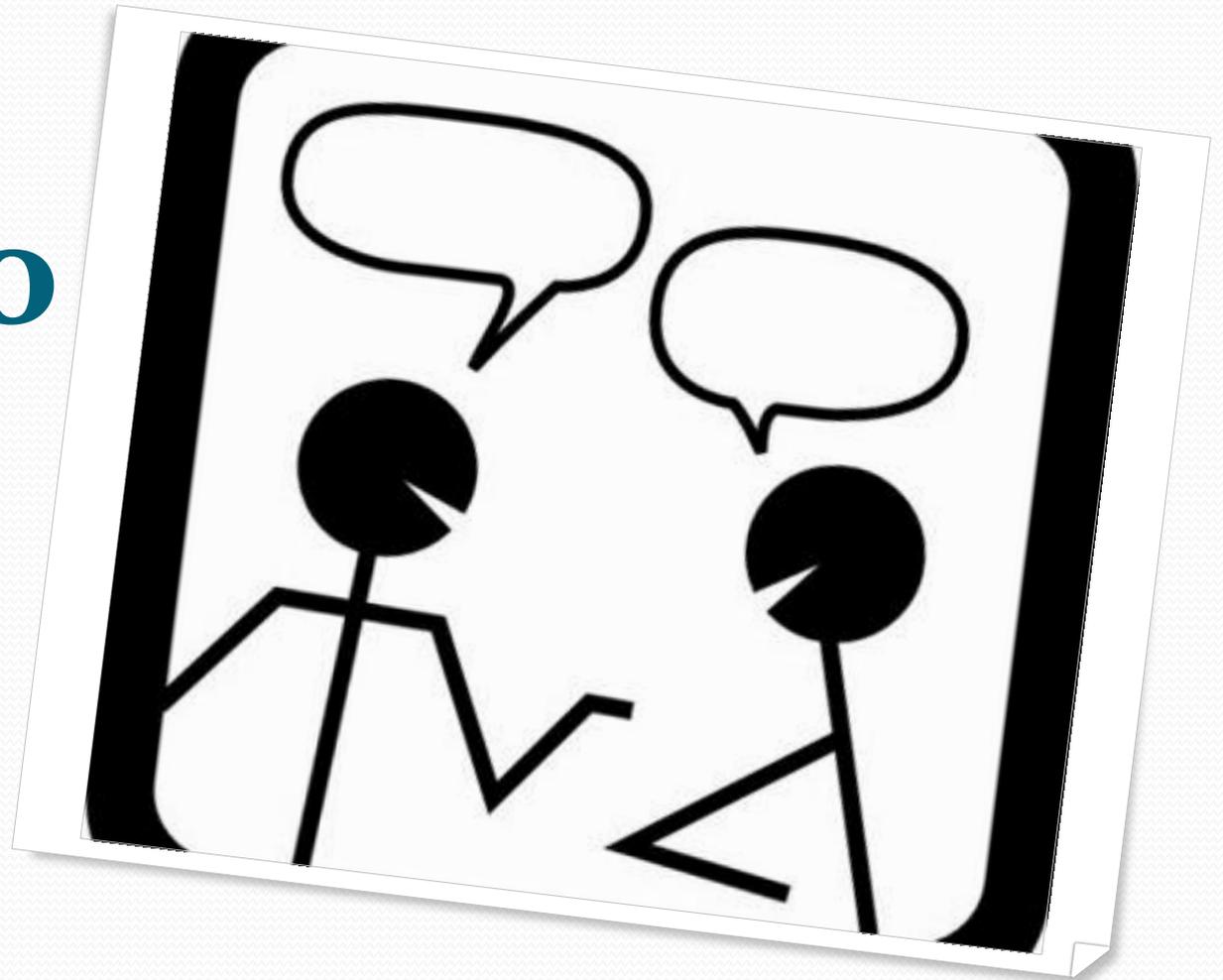
13

14

3

What are the values of a, f, l, w and y?

Over to
you!



Mistakes – Year 2

Learning Objectives

- Know what each digit in a two-digit number represents
- Be able to partition two-digit numbers
- Add a one-digit number or a multiple of 10 to any two-digit number
- Use knowledge that addition can be done in any order *e.g. to make mental calculation more efficient*
- Know by heart all addition facts for each number to at least 10 (use known number facts)

Mistakes seen where;

- *Children believe that they have to add in the order that the question was asked in*
- *Children not secure with number facts and do not use patterns to support calculating*
e.g. $14 + 5 = 19$
 $14 + 15 = 29$
 $14 + 25 = 39$
Use this to find $24 + 25$?
- *Children have difficulty remembering number pairs totalling 10*
e.g. $2 + 8$, $3 + 7$, $4 + 6$...
- *unclear about value of digits in 2-digit numbers*
e.g. $34 = 30 + 4$



Mistakes – Year 4

Learning Objectives

- Add mentally pairs of two-digit whole numbers (e.g. $47 + 58$)
- Use known number facts and place value to add mentally, including any pair of 2 digit whole numbers e.g. $47 + 36$
- Carry out column addition of two or more 3 digit numbers
- Be able to partition numbers in different ways

Mistakes seen where;

- *Children are unsure when to use column addition*
- *Children are insecure with place value and the value of each digit, e.g. Children begin adding with the left hand column first (tens instead of units)*
- *Not understanding the concept of a 'carry' when a number totals more than ten, hundred etc.*

$$\begin{array}{r} \text{e.g. } 99 \\ + 101 \\ \hline 1910 \end{array}$$



- *Children find partitioning in different ways difficult, e.g. $31 = 20 + 11$*

Mistakes – Year 6

Learning Objectives

- Carry out column addition of numbers involving decimal places.



Mistakes seen where;

- *Insecure understanding of place value continues to cause problems leading to errors in column addition*
When adding with decimals such weaknesses show up because of the 'decimal point'
- *Children unclear about 'carrying'.*
- *Children find it difficult to partition numbers with zero place holders and/or numbers less than one*
e.g. $0.45 = 0.4 + 0.05$
- *Rounding numbers is inaccurate (particularly with decimals) – children unclear about size of numbers involved which is essential for estimating whether an answer to a calculation is sensible*

Any questions?

